The Parapsychological Association
49th Annual convention
Proceedings of Presented papers

Program Chair:

Christine Simmonds-Moore, PhD.

Liverpool Hope University,

Liverpool

UK

August 4-6 2006

Hasselbacken Hotel

Stockholm,

Sweden

The Parapsychological Association 49th Annual Convention

August 4-6th 2006
Hasselbacken Hotel
Stockholm
Sweden

Program Committee

Program Chair

Dr. Christine Simmonds-Moore

Committee Members

Dr. Carlos Alvarado
Mr. Ian Baker
Dr. Rick Berger
Dr. Richard Broughton
Prof. Etzel Cardeña
Prof. Gordon Claridge
Prof. Deborah Delanoy
Ms. Nicola Holt
Dr. Harvey Irwin
Dr. Craig Murray
Dr. Ciarán O'Keeffe
Dr. John Palmer
Dr. Adrian Parker
Dr. Dean Radin
Dr. Chris Roe
Dr. Simon Sherwood
Dr. Paul Stevens
Dr. Caroline Watt
Dr. Carl Williams
Dr. Stuart Wilson

Arrangements Committee

Göran Brusewitz
Jan Fjellander
Louise Ramsby

TABLE OF CONTENTS

Section 1B. Poster presentations – Full Papers

Section Two: Floor Presentations - Research Briefs

Section Three: Panel sessions

Remembering John Beloff (abstracts)

Panel Chair - Adrian Parker

Remembering T.X. Barber (abstracts)

The Importance of survival research (abstracts)

Panel Chair – Peter Mulacz

Acknowledgments

It is a great honour to be Program Chair for the 49th annual PA convention. This year looks to be a fascinating convention, reflecting some interesting developments in parapsychology and the study of anomalous experiences. It is unfortunate, however, that we are commemorating the sad loss of two more prominent academics during this convention.

Firstly, I would like to thank this year's Program Committee who kindly gave up their valuable time to dedicate to the peer review process. This has allowed for the high quality papers we see within the proceedings booklet. Thank you Dean Radin and Caroline Watt for answering my many questions, and for their general help and support. Thanks to Nancy Zingrone for advice and words of wisdom on surviving the role of program chair. Thanks also to everyone (many who have previously held this role!) who has wished me well over the past few months. A personal thank you to Steve Moore for supporting me in the run down to the convention.

I would particularly like to acknowledge the support of Liverpool Hope University who have allowed me to dedicate time to the convention and for financially supporting me, thus enabling my physical presence in Stockholm. Thanks also to the psychology technicians Martin Guest and Lee Shannon for their valuable technical assistance. Thank you also to Janel at Omni press for being helpful and flexible. Finally, I would like to extend thanks to all the researchers who continue to research anomalous phenomena, and for supporting this field by submitting academic papers to the PA convention.

Christine Simmonds-Moore, Program chair.

PA convention 2006 – Convention Program

Friday 4th August

8.30 Registration and coffee
9.0 Welcoming remarks, Dean Radin and Christine Simmonds-Moore

Psi and the Brain

9.15 The slide-show presentiment effect discovered in brain electrical activity –Thilo Hinterberger, Petra Studer Marco Jäger Colette Haverty-Stacke, & Harald Walach
9.45 Presentiment in the brain – Dean Radin & Eva Lobach
10.15 Anomalous Slow Cortical Components in a Slot-machine Task - Dick Bierman & Jenneke van Ditzhuijzen
10.45 Coffee Break

DMILS & Distant intention

11.15 'Psychic DMILS': Attempted remote facilitation of performance in an ESP game, and an exploration of gender differences - Caroline Watt, Christine Fraser, & Alexandra Hopkinson
11.45 Effects of motivated distant intention on electrodermal activity- Dean Radin, Jerome Stone, Ellen Levine, Shahram Eskandarnejad, Marilyn Schlitz, Leila Kozak, Dorothy Mandel & Gail Hayssen
12.15 Remote Staring Detected by Conscious and Psychophysiological Variables Combining and Improving two Successful Paradigms – Susanne Müller, Stefan Schmidt & Harald Walach
12.45 *Research brief* : The Effect of Remote Emotion on Receiver Skin Conductance: A Replication - Goran Brusewitz
1.00 Lunch Break

Exploring anomalous experiences

2.30 Anomalous experiences during deep hypnosis – Etzel Cardeña
3.00 *Research Brief:* Do Out-of-body Experients Have Better Visual Imagery Skills Than Non-Experients? Wilde, Murray and Fox
3.15 Tea break

Memorial Panel for John Beloff: Remembering John Beloff

Panel Chair - Adrian Parker

3.45 John Beloff: Forging the Future of Parapsychology – Deborah Delanoy
4.00 What I learned from John Beloff – Richard Broughton
4.15 John Beloff: Some personal recollections of my mentor
4.30 The Randi Dinner – Stanley Krippner
4.45 Open discussion

5.15 End of sessions - day one
5.45 Boat trip to The City Hall, Stockholm
6.00 Evening Reception; City Hall, Stockholm

Saturday 5th August

Theories of psi: Psi as an extension of normal psychological processes

9.00 Relations between ESP and memory in light of the 'first sight' model of psi - Jim Carpenter (presented by John Palmer)
9.30 Memory, emotion and the receptive psi process - Richard Broughton
10.00 General Discussion
10.30 Coffee break and Poster Session**.**

New methods in psi research

11.00 Anomalous anticipation of target biases in guessing task – John Palmer
11.30 Design and implementation of the telepathic immersive virtual reality system – Craig Murray, Toby Howard, Jezz Fox, Fabrice Caillette, Christine Simmonds-Moore and David Wilde.
12.00 Exploring psychomanteum as a psi conducive state – Alejandro Parra and Jorge Villanueva
12.30 *Research Brief*: Developing experience-sampling methodology to explore psi in 'everyday life' - Nicola Holt
12.45 Lunch Break

Memorial Panel for T X Barber: Remembering T. X. Barber

Panel chair- Stanley Krippner

2.15 Remembering T. X. Barber – Stanley Krippner
2.35 T. X. Barber's typology's implications for parapsychology – Etzel Cardeña
3.00 General discussion

Recent Research in ESP I

2.15 Assessing the roles of the sender and experimenter in dream ESP research – Chris A. Roe, Simon J. Sherwood, Louise Farrell, Louie Savva, & Ian Baker
2.45 Experimenter- subject interaction in para experiments –Wooffitt
3.15 *Research Brief:* Group telepathy – Dalkvist and Westerlund
3.30 *Research Brief*: Twins and ESP – Adrian Parker
3.45. Tea break

Recent Research in ESP II (research brief session)

4.15 *Research Brief:* Androgyny, femininity and masculinity in women: Exploring how gender role and boundary thinness relate to paranormal experiences, beliefs and ESP – Christine Simmonds-Moore & Steve Moore
4.30 *Research Brief:* GESP and pragmatic information – Weigel
4.45 The Communicative Order of Spontaneous Psi: an Overview of Schegloff's 'On ESP Puns' – Robin Wooffitt

Anomalies and places

5.00 Psi, place memory, & laboratory space– Bryan Williams and Bill Roll
4.30 *Research Brief:* Ambient temperature and anomalies parsons and O'Keeffe
6.30 End of sessions - day two
7.15 PA Awards (presented by Dean Radin, PA president)
7.30 Presidential Address and Presidential Reception

Sunday 6th August

RNG, Consciousness and PK research I: Field effects

9.00 Entrained minds and the behavior of random physical systems – Dean Radin & F. Holmes Atwater
9.30 Field RNG Exploration during a public native american Powwow- Bryan Williams
10.00 Anomalous structure in GCP data: A focus on New Years Eve - Roger Nelson
10.30 Coffee break

RNG, consciousness and PK research II: Psychokinesis research

11.00 Experimenter effects and volitional strategies in the mind-machine interaction replication – Joop Houtkooper
11.30 Assessing the role of the sender as a PK agent in ESP studies: The effects of strategy ('willing' versus absorption) and feedback (immediate versus delayed) on psi performance – Chris Roe and Nicola Holt

Invited Address

12.00– Some thoughts on OBEs, NDEs, and the study of spontaneous psi experiences - John Palmer
12.45. Lunch Break

Mediumship, Posession and Survival

2.30 A medical-psychological approach to the possession case behind William Blatty's the Exorcist – Sergio Rueda
3.00 The Social Organization of Trouble Management in Psychic Practitioner - Sitter Interaction: Three Discursive Strategies – Robin Wooffitt
3.30 *Research Brief:* Are Psychics Perceived to be more Accurate and Persuasive than Non-Psychics?– Craig D.Murray & Ciarán O'Keeffe
3.45 Tea break

Panel – The Importance of Survival research

Panel chair – Peter Mulacz

4.15 Basic issues of the 'survival' question – Peter Mulacz
4.35 Anomalous Identity Experiences: Mediumship, Spirit Possession, and Dissociative Identity Disorder - Etzel Cardeña
4.55 Apparitions and Cases of the Reincarnation Type – Erlandur Haraldsson
5.05 A tentative reinterpretation of memories of a previous life – Suitbert Ertel
5.20 The importance of subjective experiences in survival research – Christine Simmonds-Moore
5.40 Closing Remarks – Stanley Krippner

Discussion Session - Parapsychology in 21st century

5.45 Including professors from key institutions and a general floor discussion
6.30 End of sessions - day three
8.00 Banquet
Post Banquet speaker - Fredrik Praesto "Unbelievable magic tricks and an exploration of the psychology behind them"

End of convention.

ANOMALOUS SLOW CORTICAL COMPONENTS IN A SLOT-MACHINE TASK

Dick J. Bierman & Jenneke van Ditzhuijzen
University of Amsterdam

ABSTRACT

Thirty-two subjects participated in a 128 trial slot machine task. The task was initiated by the subjects. With intervals of one second the three windows of the slot machine froze. There were three types of events: three subsequent different fruits (XYZ), two equal fruits followed by a different one (XXY) and three equal fruits (XXX). The events were selected randomly with replacement from a limited pool of possible events. The subject had to pay 0.5 euro (real money) for each trial and received 7 euro for winning (XXX) events. The a priori probability for an XXX-event was 12.5% throughout the experiment. The subject could not know nor learn what the next fruit to be displayed would be. The subjects kept the money they won at the end but never had to pay when they eventually lost money. Following brain research with slot machines we analyzed the pooled medio-frontal signals from the Fz, Cz and Pz lead, using pre-processing parameters specified in the literature. There was a significant difference between the slow wave preceding a 'win' and preceding a loss (XYZ). This difference can be explained by the fact that after the second fruit has been 'frozen' the subject is aware that in the XYZ condition the possibility for a win has vanished. However the difference was observed to develop before the second fruit froze i.e. before there was any visible difference between the conditions. This anomaly was confirmed by a comparison of the XXY and the XXX condition where, for the relevant period from 1 to 2 seconds, there was no visible difference for the subject and nonetheless the brain signals differed by about 1.9 microvolt on average (t= 2.35, df=31, p=0.026). These anomalous results were not significantly associated with 'perceived luckiness' although the 15 subjects who perceived themselves as 'lucky' did have a much larger effect of ~ 2.9 microvolt compared with the other subjects (~0.6 microvolt). Exploratory analyses showed some suggestive evidence for the effect of sustained attention and of the belief to be able to 'influence' the slot machine.

INTRODUCTION

Intuition and Anticipation

The concept of intuition can largely be understood in the framework of Damasio's somatic marker model (Damasio, 1996). Three processes are assumed to be relevant when it comes to intuitive decisions, i.e. decisions made on the basis of a feeling rather than an elaborate analytical evaluation. In the first place the knowledge driving the decision is assumed to be learned implicitly and often this knowledge is hardly accessible to the subject by explicit search. This knowledge is assumed to be 'labelled by' or 'associated with' the emotions and bodily state that occurred at the time the outcome of the decisions were experienced. In the second place when a similar problem arises this knowledge and the associated emotion is non consciously activated. In the third place the emotion associated with previous outcomes of similar problem situations biases the decisions the person makes. So according to this framework for intuition, the processes involved are: implicit learning, somatic marking and biasing of the 'solution' space by non consciously activated implicit knowledge and emotions (Bierman et al, 2005).

However there is plenty of anecdotal evidence suggesting that sometimes people do seem to make what they call intuitive decisions, without having gone through the process of acquiring implicit knowledge because they haven't encountered the same situation before, either in person or in reading about it. For instance people might report an uncanny feeling when driving on a highway resulting in a decision to slow down. A few moments later a deer crosses the highway just in front of the driver. Such a decision driven by no knowledge, either explicit or implicit, from the current context or the past is generally assumed to be a pure chance decision. And of course random decisions can sometimes have a positive and sometimes a negative outcome. Thus these anecdotes can easily be accounted for. However in experimental situations the probability for calling behavior random can be calculated. For instance in Damasio's famous card selection gambling experiment subjects showed a larger skin conductance (presumably correlating with a larger arousal) before they selected a 'loosing' card compared with the skin conductance before selecting a 'winning' card. This in spite of the fact that the order of the winning and loosing cards in the decks was random and according to the authors (Bechara et al, 1996) that the subjects had no way to infer anything about this order. The probability of that difference in skin conductance preceding the feedback of the card occurring by chance was smaller than 1 in 20. (Bierman, 2002)

Although this specific experiment was not set up to test the claim of 'an unexplained uncanny feeling before a loss', there have been a number of studies which were specifically designed to do so. In these studies subjects were presented with random events that could have a positive (or neutral) outcome and a negative outcome. In some of these studies subjects were exposed to random positive and negative pictures and in other studies to alarming or neutral sounds (Spottiswoode & May, 2003). In those studies there appeared to be a small but consistent baseline difference with regard to the future condition. Note that these baseline values were generally taken during the time that the subject was building an expectation about the subsequent stimulus condition. However these baseline (or anticipatory) differences were unexplainable because, given the proper randomization with replacement of the conditions, there was no way that the subjects could infer the future condition (Bierman & Radin, 1997, 1998). The anomaly, dubbed "presentiment" or "prestimulus response" has been replicated with several physiological variables like Skin Conductance Level (Radin, 1997, 2004), Skin Conductance Response (Spottiswoode & May, 2003), Heart Rate (McCraty et al, 2004 a,b), ERP (McCraty et al, 2004a,b), slow cortical potentials (Levin and Kennedy, 1975; Hartwell, J.W., 1978) and recently also BOLD (blood oxygenation level, the dependent variable in fMRI experiments) (Bierman & Scholte, 2002; Journal of ISLIS)

If the anomaly, by accumulating evidence, turns out to be a real effect then this effect might be a fourth process contributing to intuitive decisions. This process could 'explain' the anecdotal evidence as mentioned above and might explain what some have called "naïve intuition".

The conventional view of anticipation is that "in fact our view of the future is based upon our past experiences" (Brunia, 1999). This view is a direct consequence of assumed forward causality. Backward or retro-causality is seen as a logically incoherent concept resulting in paradoxes like the famous grandfather paradox. However discussions on time-travel in the physics community (Morris et al, 1988) have resulted in refinement of the logic and retrocausality might not result in logical paradoxes if some constraints are applied. Also all of physics is fundamentally time-symmetric and hence 'waves travelling backwards in time' are theoretically possible and do not cause paradoxes (under the condition that the information travelling backwards cannot be used to alter its source; see Price, 1996).

Anticipation has been studied by the measurement of slow cortical potentials in the brain since the 1960s (Walter, Cooper, Aldridge, McCallum, and Winter, 1964). The label CNV (continuous negative variation) was used originally and after it was discovered that a similar slow negative going potential occurred before preparing a motor response a second label "Readiness potential" was used (Deecke, 1987). In more recent years the motor component has been shown to be less relevant than Deecke suggested and stimulus preceding negativity was observed in several contexts. The conclusion of this work to date is that anticipation is "a state that is characterized by the activation of the brain areas required for the specific upcoming operations. For instance, anticipation of perceptual input may activate posterior areas, anticipation of affective input right frontal areas and so on" (Boxtel & Böcker, 2004). The work of Donkers (Donkers, Boxtel, 2005 & Donkers, Nieuwenhuis & Boxtel, 2005) specifically used a paradigm where no responses were required to support this line of thinking. In their experiments where they measured medio-frontal potentials, subjects were just observing a simulated slot machine where three digits would appear with about one second interval. When the consecutive three digits were identical the subject would win (or in another condition lose) money. In the present experiment we used basically the same paradigm to test if indeed the slow cortical potential preceding the final outcome would be different for different outcomes in spite of these outcomes being selected randomly.

Hypothesis

Following the literature on “presentiment” we expect that the brain signals preceding a ‘win’ will differ significantly from the brain signals before a loss. This will be tested by comparing the mean voltage during the one second preceding the final outcome (XXX, or XXY or XYZ) pooled from all three medio-frontal electrodes (Fz, Pz and Cz). We will also explore if there are differences between these three electrodes and the results obtained from other leads. Finally correlations between a potential “presentiment” effect and the responses from questionnaires, measuring ‘perceived luckiness’ will be explored.

METHODS

Participants

Thirty-two subjects, 22 female and 10 male, between the ages of 17 and 51 (mean = 23; sd = 7.5) participated in the experiment. Participants were students and could earn course credit or money or a combination. The amount of money they could earn was determined by the outcome of the slot-machine task. (see details below).

EXPERIMENTAL TASK AND PROCEDURE

Materials

Stimuli. The slot-machine was implemented using video clips. Each video clip contained a movie of a slot-machine with three windows with moving fruits (see fig.1). The subject had to press any key to run the clip.

Figure 1 Slot machine as presented to the subjects. The picture shows the final state after all three fruits had stopped spinning. This is an example of the XYZ condition (all three fruits different)

All the clips were identical (copies of a mother clip) apart from the key frames where a fruit appeared in one of the three windows. The mother clip initially shows all three windows in running mode. After 1 second the left-most window freezes into one of 4 possible fruits. We call this event S1. After another second the middle window freezes (S2) and after another 1 sec the last rightmost window freezes (S3).

The slot-machine presentation software was written in RealBasic 5 and the clips were presented on an 17 inch LCD screen (LG Hatron 795FT 1024*768*32 bit) connected to a 3.0 GHz Pentium IV computer running Window XP. A *nvidia pcx 5300* videocard was used. Synchronization with the EEG data-acquisition was done using a photocell glued to a screen that mirrored the stimulus presentation screen. The video clip to be presented was copied pseudo-randomly using RealBasic's rnd function at button press time from a prepared pool of 128 slot-machine video clips. This pool contained 16 XXX, 24 XXY and 88 XYZ clips.

Perceived Luckiness Questionnaire

The PLQ was designed to classify participants as perceiving themselves as either lucky or unlucky as part of a larger project concerning the psychology of luckiness (Smith, 1998). To ensure that it was clear to participants how the terms 'lucky' and 'unlucky' were being used, the questionnaire presented participants with the following two descriptions of 'lucky' and 'unlucky' people:

A. Lucky people are people for whom seemingly chance events tend to work out in their favor. For example, they seem to win more than their fair share of raffles and lotteries. Dice seem to roll in their favor and roulette wheels often choose their numbers. Other times they might seem lucky in everyday life. For example, they always seem to find a parking space when they need one, or they accidentally meet people that can help them in some way.

B. Unlucky people are the opposite: seemingly chance events tend to work out against them. For example, they never seem to win anything on games of chance. Sometimes they seem unlucky in everyday life. For example, they can never find a parking space when they need one, or they tend to be involved in accidents that are not their fault.

Emphasis was placed upon the consistency of outcomes of seemingly chance events. It was also emphasized that these events may be within or outside the context of games of chance and that they may relate to trivial or significant events.

For each description, respondents were asked to rate on a seven point scale how well it described themselves (where 1 = 'doesn't describe me at all' and 7 = 'describes me very well'). Confidence ratings for each of these responses were obtained on another seven point rating scale (where 1 = 'not at all confident' and 7 = 'extremely confident').

Participants who gave the 'lucky' description a rating of '4' or above, and gave the 'unlucky' description a lower rating (with confidence ratings of at least '3' for both of these responses) were classified as lucky. Respondents who gave the 'unlucky' description a rating of '4' or above, and gave the 'lucky' description a lower rating (with confidence ratings of at least '3' for both of these responses) were classified as unlucky. Respondents who could not be classified as either lucky or unlucky were classified as uncertain.

Exit Questionnaire

The Exit Questionnaire consisted out of a few questions dealing with among others gambling behaviour (if any), and the level of attention the subjects had paid to the task. The student participants who participate for course credits have to fulfil this requirement and are not always very much interested in the experiments they have to do.

Procedure

Participants were first informed about the EEG measurement emphasizing that the method is passive and doesn't bring any health risk. They signed the informed consent form and filled in the 'perceived luckiness questionnaire' (ref) before entering the experiment.

At the beginning of the experiment each participant was given a loan of seven pieces of 50 eurocents. They were told they could win playing the slot machine but overall never lose. The stimulus program started with an instruction page telling the participant that s(he) had to 'pay' 50 cents for each trial and that the outcomes were random. The XXX outcome would be winning and the experimenter would pay the participant 14 pieces of 50 eurocents in case of an XXX outcome. After the instruction that the participants would 'play' 128 times a demo trial was shown to the subject. After completion of the trials the participant was requested to fill in the Exit questionnaire.

Psychophysiological recording

The electroencephalogram (EEG) was recorded from 34 '*BioSemi*' sintered Ag-AgCl electrodes (i.e. A1:A30 plus). The active electrodes were mounted in a head cap according to a standard extended 10-20 system montage. The *BioSemi* system replaces the reference electrode(s) used in more conventional systems with a common mode sense (CMS) active electrode and a driven right leg (DRL) passive electrode (see www.biosemi.com for elaborate explanations). In this way any electrode or combination of electrodes can be used as a reference. The choice can be made at any time during later analysis. The electro-oculugram (EOG) was measured from 4 sintered Ag-AgCl electrodes. One pair was placed on a horizontal line at the outer canthi of the left and right eye to monitor horizontal eye movements. The other pair was placed on a vertical line above and below the left eye to monitor blinks and vertical eye movements. Data from all channels were amplified with the *ActiveTwo* AD-box and were digitized with a 24 bit resolution at a rate of 512 samples per second and fed through a NI PCI-DIO-32HS card into a 2.8 GHZ Pentium IV computer running Windows XP.

Data Analysis

For the analysis we used the commercially available BrainVision Analyzer package. All raw data were first sampled down to 128 Hz using spline interpolation methods.

Following exactly the pre-processing procedure and pre-processing parameters as used in published research with a slot-machine task (Donkers et al, 2005), data were first filtered using a 0.01-25 Hz Butterworth zero-phase bandpass filter (24 db/oct) and then corrected for eye movements and blinks using the procedure described by Gratton, Coles and Donchin (Gratton et al, 1983). After segmentation on the basis of markers issued exactly at the freezing of the second fruit (which we call t=0, or S2 in the figures), artifacts were removed using an automatic rejection procedure: segments were excluded from further analyses when the minimum and maximum amplitude in a segment differed more than 100 Microvolt. Finally the means for the different conditions were baseline corrected following the standard in the BrainVision analysis package using the interval of 200 msec preceding the freezing of the first fruit (for more details please check www.brainproducts.com). Analyses were focused on the medio-frontal electrodes Fz, Cz and Fz. The dependent variable used throughout was the mean value of the brain potential pooled over the three medio-frontal electrodes the second before feedback. The main hypothesis was tested using a paired sample t-test. Exploratory analyses were done using a repeated measure MANOVA with the between subject variables 'Perceived Luckiness', and the responses on the exit-questions and the two conditions XXX and XXY as repeated within subject measures.

RESULTS

Subjects

The data of one subject (Ss25) were unusable because after removal of segments based upon the predefined artefact removal criteria, there was not a single usable segment left. We therefore invited an extra subject to get to the pre-specified sample of 32 subjects.

EEG Signals

Figure 3 shows the medio-frontal EEG split for the three conditions (XYZ, XXY and XXX) for the pre-processed data pooled over all 32 subjects.

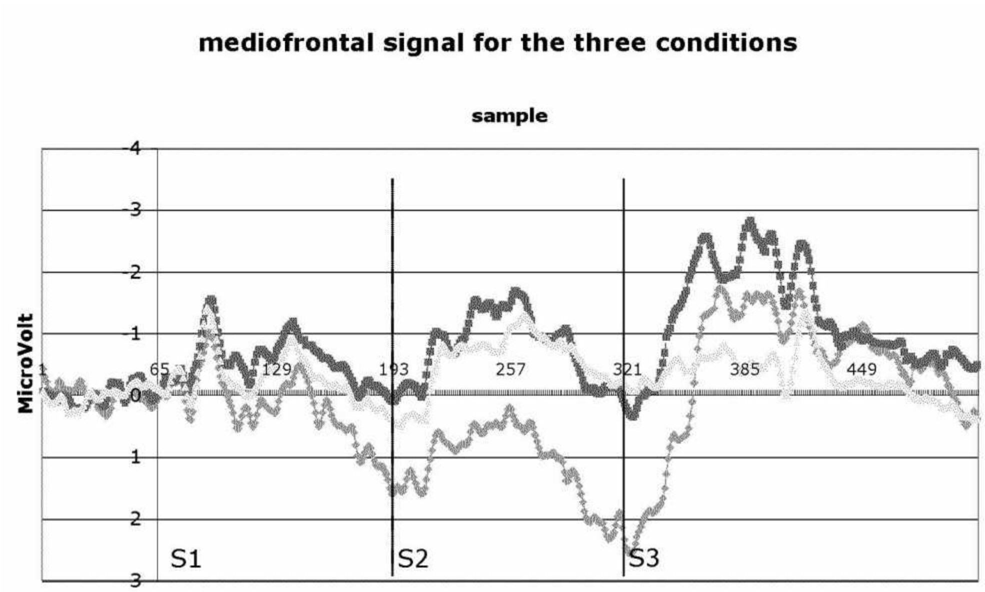

Figure 3. Average brain signal from 32 subjects pooled from electrodes Fz, Pz and Cz. The slot machine freezes its first fruit at -1.0 (s1), the second on 0.0 (s2) and the third at 1.0 seconds (s3). Light (middle) trace: XYZ condition (all fruits different). Dark (upper) trace: XXY condition and Lower trace: XXX (win) condition.

STATISTICAL ANALYSIS

Is there a difference between the XXY and XXX condition during the second before final feedback (S2-S3 interval)?

This main hypothesis was tested by a two sample paired t-tests. The mean difference of 1.88 microvolt has a t-value of 2.35 ($df = 31$, $p = 0.026$ two tailed).

Although in psychophysiological analyses in general normality is assumed, given the anomalous nature of our results, we also applied the non parametric Wilcoxon Signed Rank test. Giving a tied Z-value of 2.206 ($p = 0.027$ two tailed). The percentage of subjects with an effect in the predicted direction is 62.5% (# ranks > 0 = 20; # ranks <0 = 12. Mean ranks 19.1 and 12.167 resp.). Thus it can be concluded that there is an anomalous difference between the XXY and the XXX condition during the last second preceding the final feedback.

EXPLORATIONS

Is the effect dependent on Perceived Luckiness?

In order to evaluate this question we performed a repeated measure ANOVA with the conditions XXY and XXX as repeated measure and the 'perceived luckiness' personality variable as between subject variable. Data of the two first subjects were unavailable. We reduced the number of classes to the class of subjects that called themselves 'lucky' (N=15) and those that were classified as 'unlucky' or 'uncertain' (N=17).

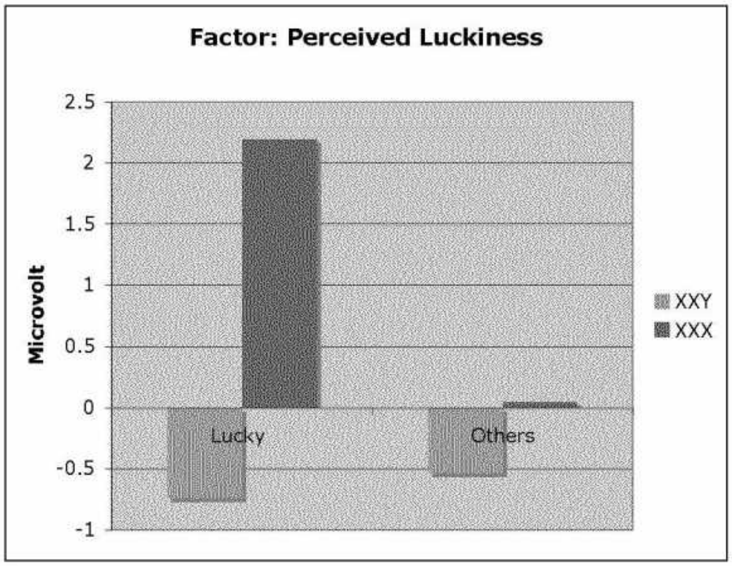

Figure 4 Mean potential between S2 and S3 for the winning (XXX) and loosing (XXY) trials, split for lucky and other subject.

The 15 "perceived lucky" subjects did have the largest effect of more than 2.90 microvolt in contrast with the 15 subjects in the other groups with hardly any effect (~ 0.6 microvolt). However there is no interaction (F=1.99, *df*=1, *p*= 0.17) and we thus cannot conclude that these groups do differ.

Is the effect dependent on Gender?

In order to evaluate this question we did a repeated measure ANOVA with the conditions XXY and XXX as repeated measure and Gender as between subject factor.

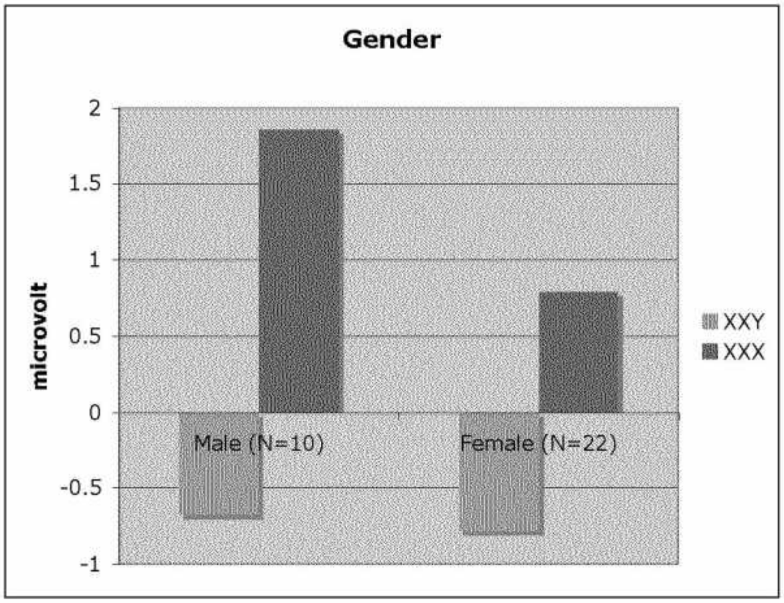

Figure 5 Mean potential between S2 and S3 for the winning (XXX) and loosing (XXY) trials, split for Gender.

The effect size is larger for male (~ 2.6 microvolt) than for female (~1. 5 microvolt) but the difference is not significant. Note that the difference in effect size is completely due to the XXX condition where the male have about twice as large an effect.

Is there a difference between different leads?

The medio-frontal leads. In order to answer this question we did a repeated measure with the three leads (Pz, Fz and Cz) difference signals as repeated measure.

The effect turns out to be independent of medio-frontal lead (F=0.453, *df*= 2, *p*=0.64). I.e. the effect is visible on each of these electrodes though mostly on Fz (mean difference is 2.14 microvolt) and Cz (mean difference is 2.30 microvolt)

The other leads. Analysis of all leads shows that the neighbouring electrodes CP1, C3, and FC1 also show mean difference in the range of 2 microvolt while the other leads have substantially smaller effects. Interestingly the effect seems to extend to the right frontal lobe (Fp2) where a large mean difference of 5.28 microvolt between XXY and XXX is measured. This large mean effect however doesn't reach statistical significance due to the large variance.

Is there a relation with being an actual winner or an actual loser?

There were 18 subjects ending the slot-machine game with a negative balance and 14 with a positive. The anomalous effect did not interact with membership of either of these groups (F= 0.036, *df*=1, n.s.)

Is there a relation with the responses on the Exit Questionnaire?

For these analysis we first calculated difference scores (between XXY and XXX) and entered these in a regular ANOVA with the answer on the exit question as a between subject factor.

Question: Did you maintain attention (1-5; 1 = not at all)? One subject responded with ‘1’. A cell with only one subject cannot be handled by the ANOVA so this subject was reclassified as ‘2’. The results are somewhat surprising and show a nearly perfect linear relation of the difference between XXX and XXY condition and sustained attention ($F = 2.79$, $df = 3$, $p = 0.06$); this result becomes better when omitting the reclassified subject). Note especially the extremely large effect of 5.9 microvolt for the 5 subjects claiming to have sustained the highest attention level.

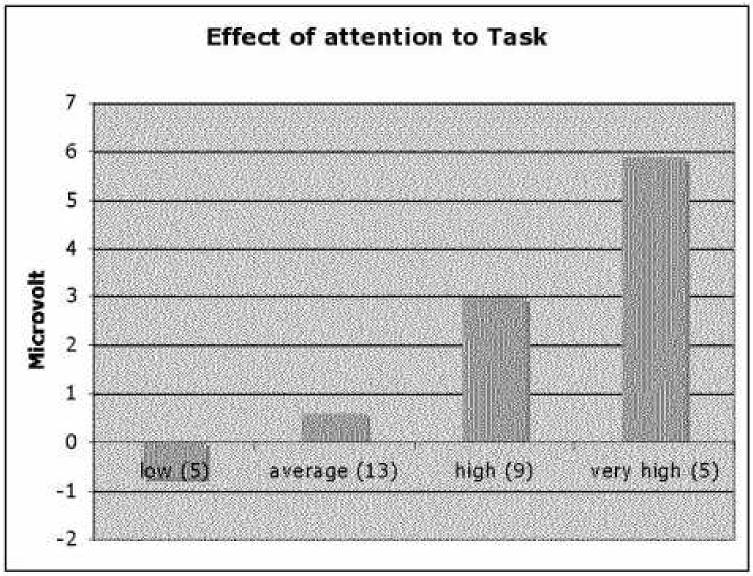

Figure 6. Mean potential difference between XXX and XXY trials during the S2- S3 interval in relation to the self-rated attention subjects paid to the tasks (number of subjects between parentheses).

Do you think you were able to 'influence' the outcome? There was a significant relation (F= 4.57, df = 2, p= .019) between the XXX-XXY effect and the belief of the subjects that they were able to influence the outcome of the slot-machine (which within normal assumptions of course would not be possible because the clips were selected randomly).

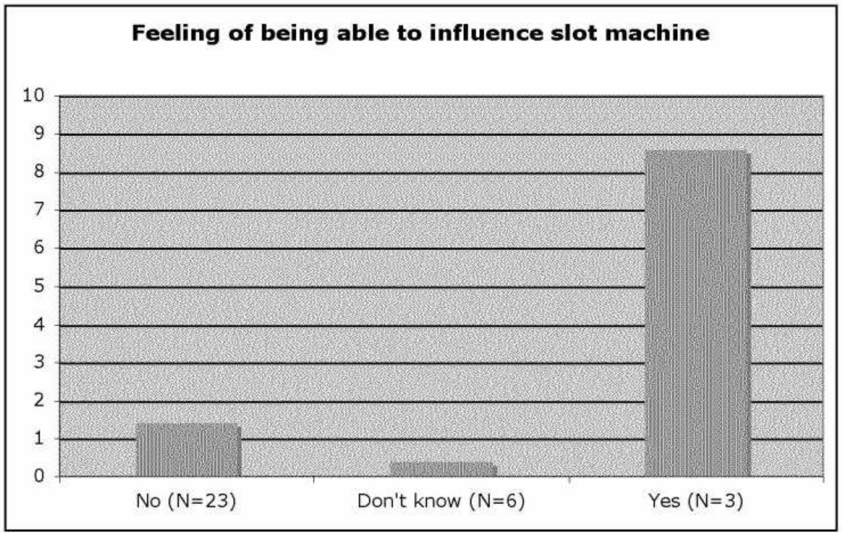

Figure 7. Mean potential difference between XXX and XXY trials during the S2- S3 interval in relation to the self-rated feeling of control subjects paid thought to have (number of subjects between parentheses).

Is there a relation with real gambling behavior?

There was no relationship between 'how often people did gamble' and the XXX-XXY effect.

DISCUSSION

In order to get a general impression about the quality of the study we compared the current results with results from published similar slot machine experiments

Figure 8A gives the mean brain potentials of all subjects and all conditions of the data pooled over the medio-frontal (Fz, Cz and Pz) electrodes in the current experiment. When comparing these results with results from the literature (fig. 8B from: Donkers et al, 2005) there appears to be discrepancies, especially with regard to polarity and magnitude of the evoked potentials around – 0.8, 0.2 and 1.2 sec. However this could potentially be due to a different form of referencing that we used in the current study. In order to check if the discrepancy was indeed due to the different form of implicit referencing used in the Biosemi system, we re-referenced all channels to the combination of T7 and T8 which is closest to the mastoid electrode reference used by Donkers et al. After re-referencing the over-all results do indeed closely replicate the earlier findings in the literature (see Fig. 8C).

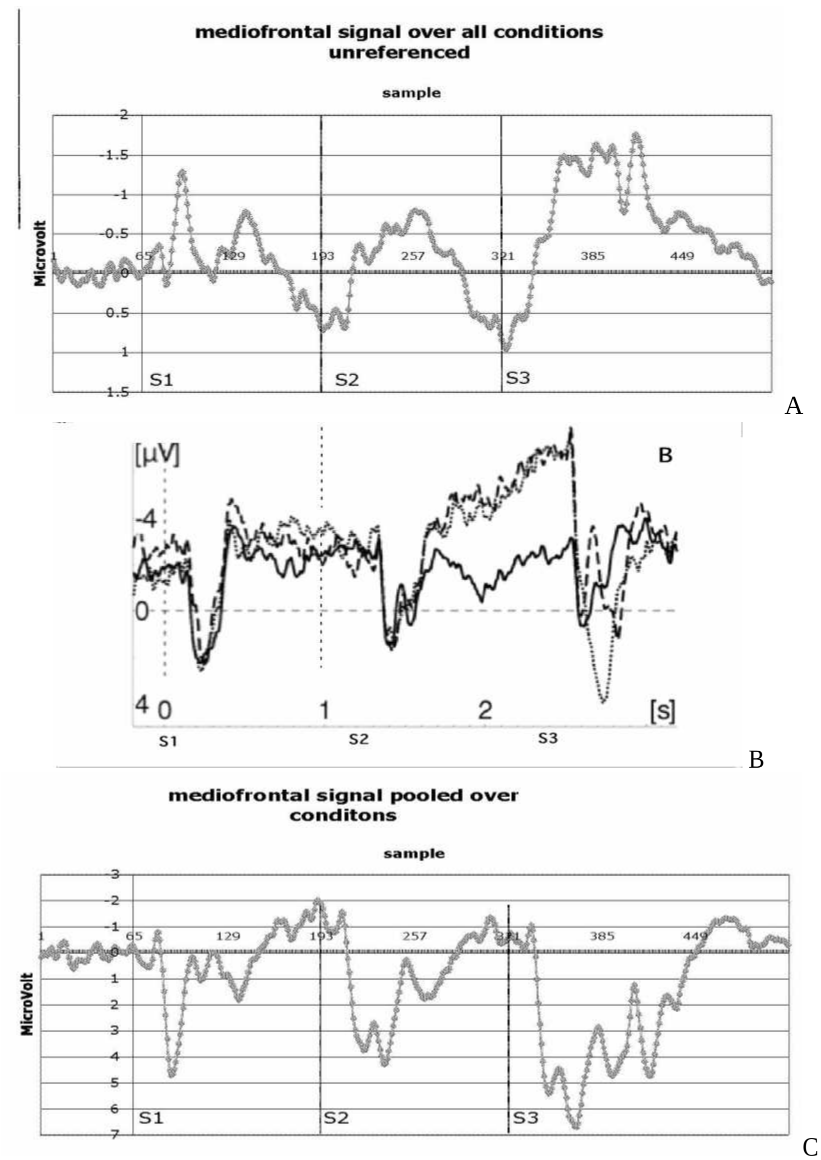

Figure.8: medio-frontal EEG signal in the slot machine task. A: original data referenced to the CMS lead. B: data as published by Donkers et al (2005); C: current data after re-referencing to the T7-8 leads.

Data acquisition and Preprocessing

The pre-processing of the EEG signals before averaging was standardized and all pre-processing parameters were specified in advance. The BioSemi data acquisition hardware and software has two filters. The first filter is an analog anti aliasing, first order, RC filter (3 db at 3.2 kHz) which, by its hardware nature, can only have a causal (i.e. forward in time) effect. After analog to digital conversion there is a 5^{th} order sinc filter (-3db at 20% of sampling rate). This filter only uses past samples to get the actual filtered value.

Nonetheless it could be that either the ocular correction, or the further digital filtering as described in the analysis section do introduce distortions. These distortions might be dependent on the maximum amplitude of the response after S3. Thus they could differ for the three conditions XXX, XXY and XYZ.

We evaluated the whole sequence from the scalp to the final pre-processed signal (i.e. including the BioSemi filters with a signal generator that fed a precisely known test signal at the electrodes. This was done for two different test signals identical to the mean values in the XXX and XXY condition. From this pseudo analysis we concluded that the pre-processing did not introduce any artefact.

Randomization

The claim that there were no means by which the subject could infer the future outcome is based upon the randomization used and upon the claim that the presented materials did not contain any information that could be used to infer the final outcome.

In contrast with the general practice in psychophysiology the randomization in this experiment was not based upon shuffling of conditions. The latter procedure is generally used to guarantee a counterbalanced design so that conditions appear with equal frequency. It is known that with such a method of randomization subjects are able to entertain a correct estimate of the probabilities for a specific condition to appear in the next trial. This is because basically the next condition is not completely independent from the previous ones as is required for true randomization. In other words in a counterbalanced design the gambler's fallacy is not a fallacy.

The randomization used in the current experiment consists of the selection of a random clip from a pool of clips. The clip is not removed from the pool and hence the probabilities to select a winning or a loosing clip are, in principle, completely independent of the previous trials. We checked the actual produced sequences by looking at the autocorrelation of the condition sequence for all subjects with a lag from 1 to 10.

Only in one case we found a marginally significant correlation of 0.2 at a lag of 2.

Thus we believe that there is no discernable pattern in the actual condition sequences that could explain the fact that subjects brain signals correlate with a future condition.

To control if the subjects were using some pattern in the random sequence we compared the results for the first 64 trials of each subject with the last 64 trials. If the subjects do learn and use what they learn to 'predict' the outcome of the slot machine then the effect should be larger in the second part of the 128 trials.

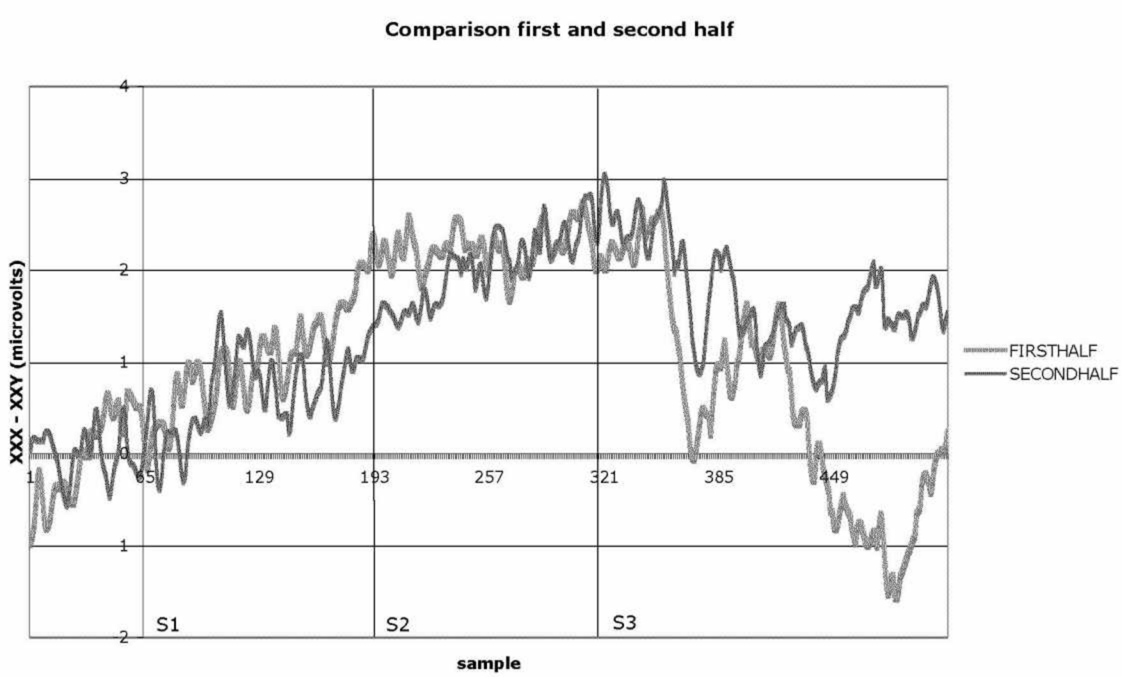

Figure 9: The difference wave (XXX-XXY) for the first 64 trials and for the last 64 trials of the session, averaged over all subjects.

Figure 9 shows the mediofrontal EEG averaged over all subjects split for the first 64 (a) and last 64 trials (b). It is obvious that if there is any temporal effect it is a decline rather than an incline. We must conclude that the effect is not mediated by a mechanism mediated through learning.

Materials

The video clips were produced with the 'Adobe After Effect' package. This package uses layers that can be enabled or disabled. In one layer there is the spinning slot machine while in other layers the four different fruits on 3 positions are available. So basically all clips are identical only the enabling options are switched. This approach guarantees that all frozen fruits will always have the same positions.

In case there would be a difference the subject also need to learn those differences before he or she might use them. Therefore the test for learning of possible patterns in the randomization also tests for learning of differences in the material from which the final outcome could be inferred.

Exploratory Analyses

The exploratory analyses show a few relations that seem to make sense and therefore support the findings though not necessary the interpretation thereof. In the first place the relation with the sustained attention is quite impressive at least qualitatively. With 4 levels used in the assessment of the subject's attention the relation is marginally significant but if the lower half and the upper half are pooled the difference is quite significant (t=2.54, df=30, p= 0.016).

The relation of the effect with the belief of the subjects that they may be able to 'influence' the outcome of the slot machine is also remarkable. The three subjects claiming to be able to influence the slot machine do show a huge effect, so large that, even with their low number of 3, the interaction is significant.

CONCLUSION

It is good custom to await further replication if extraordinary claims are made. And indeed we are currently running two replications with other (student) experimenters. One of the two is a straightforward replication where some of the participants have been tested in the current study, thus allowing for test-retest reliability assessment. The other study aims at comparing psi effects with implicit learning effects thus possibly extending the idea that intuition based upon implicitly acquired knowledge and psi based upon future knowledge are partly related.

Independent replications at other laboratories would add significant weight to the current findings. We suspect that in a number of cases these independent data are already available and just a new analysis of the old data is required.

The current results also add to the already significant body of experimental data where similar effects, apparently conflicting with forward causality, have been reported. These involve physiological variables like skin conductance, blood pressure, ECG and even BOLD. However it is far too early to conclude that these paradigms, often called presentiment effects, produce more robust data than other psi paradigms, although the consistent relations with personality and situational variables reported in this article do certainly increase the expectations.

REFERENCES

Bechara, A., Tranel, D., Damasio, H., & Damasio, A. R. (1996). Failure to respond to anticipated future outcomes following damage to prefrontal cortex. *Cerebral cortex*, 6-2, 215-225.

Bechara, A., Damasio, H., Tranel, D., & Damasio, A. R. (1997). Deciding advantageously before knowing the advantageous strategy. *Science, 275,* 1293-1295.

Bierman, D.J. (2002). New developments in presentiment research on the nature of time. J. Fernandes & N.L.Santos (Eds). Proceedings of the second international symposium Frontiers of Science, Consciencias (Porto, Oct. 26-28, 2002)1, pp 89-124.CTEC, ISSN: 1645-6564

Bierman, D. J. & Radin, D. I. (1997). Anomalous anticipatory response on randomized future conditions. *Perceptual and Motor Skills*, 84, 689-690.

Bierman, D. J. & Radin, D. I. (1998). Conscious and anomalous non-conscious emotional processes: A reversal of the arrow of time? *Toward a Science of Consciousness, Tucson III.* MIT Press. (pp. 367-386)

Bierman, D. J. & Scholte, H. S. (2002). *Anomalous anticipatory brain activation preceding exposure of emotional and neutral pictures.* Paper presented at Toward a Science of Consciousness, Tucson IV.

Bierman, D. J., Destrebecqz, A., Cleeremans, A. (2005).Intuitive Decision Making in Complex Situations: Somatic Markers in an Artificial Grammar Learning Task. *Cognitive, Affective, & Behavioral Neuroscience, 5*- 3, 297-305.

Brunia, C.H.M. (1999). Neural aspects of anticipatory behavior. *Acta Psychologica*, *101*, 213-242.

Brunia, C.H.M., van Boxtel, G.J.M. (2001). Wait and see. *International Journal of Psychophysiology, 43*, 59-75.

Damasio, A.R. (1996). The Somatic Marker Hypothesis and the Possible Functions of the Prefrontal Cortex. *Philosophical transactions of the Royal society of London.* series B-biological sciences*, 351*: (1346), 1413-1420.

Donkers, F.C.L., & Boxtel, G.J.M. van (2005). Mediofrontal negativities to averted gains and losses in the slot-machine task: a further investigation. *Journal of Psychophysiology, 19(4)*, 256-262.

Donkers, FCL, Nieuwenhuis, S. & Boxtel, GJM van (2005). Mediofrontal negativities in the absence of responding.(2006). *Cognitive Brain Research*, In press.

Deecke, L. (1987). Bereitschaftspotential as an indicator of movement preparation in supplementary motor area and motor cortex. In G. Bock (Ed.), Motor areas of the cerebral cortex : CIBA Symposium 132. London: Wiley.

Don NS, McDonough BE, Warren CA. (1998). Event-related brain potential (ERP) indicators of unconscious psi: A replication using subjects unselected for psi. *Journal of Parapsychology, 62,* 127–145.

Gratton, G., Coles, M.G.H., & Donchin, E. (1983). A new method for off-line removal of ocular artifact. *Electroencephalography and Clinical Neurophysiology, 55*, 468-484.

Hartwell, J. W. (1978). Contingent negative variation as an index of precognitive information. *European Journal of Parapsychology*, 2, 81-104.

Hartwell, J. W. (1979). An extension to the CNV study and an evaluation. *European Journal of Parapsychology, 4,* 358-365.

Jasper, H. H. (1958). The ten-twenty electrode system of the International Federation, *Electroencephalography and Clinical Neurophysiology*, 10, 370-375.

Levin, J. & Kennedy, J. (1975). The relationship of slow cortical potentials to psi information in man. *Journal of Parapsychology, 39,* 25-26.

May, E. C., Paulinyi, T., & Vassy, Z. (2005). Anomalous anticipatory skin conductance response to acoustic stimuli: Experimental results and speculation about a mechanism. *Journal of Alternative and Complementary Medicine, 11*, 695-702.

McCraty, R, Atkinson, M. & Bradley, R.T. (2004a). Electrophysiological evidence of intuition: Part 1. The Surprising role of the heart. *Journal of Alternative and Complementary Medicine, 10,* 133–143.

McCraty, R, Atkinson, M. & Bradley, R.T. (2004b). Electrophysiological evidence of intuition: Part 2. A system-wide process? *Journal of Alternative and Complementary Medicine, 10*, 325–336.

McDonough, B. E., Don, N. S., & Warren, C. A. (2002). Differential event-related potentials to targets and decoys in a guessing task. *Journal of Scientific Exploration, 16*, 187-206.

Morris, M.S., Thorne, K.S. , and Yurtsever, U. (1988).Wormholes, Time Machines, and the Weak Energy Condition, *Phys. Rev. Lett. 61*, 1446–1449.

Price, H. (1996). *Time's arrow and Archimedes' point: New directions for the Physics of Time*. Oxford University Press.

Radin, D. I. (1997). Unconscious perception of future emotions: An experiment in presentiment. *Journal of Scientific Exploration*, *11*, 163–180.

Radin, D. I. (2004). Electrodermal presentiments of future emotions. *Journal of Scientific Exploration. 18*, 253-274.

Rosenthal, R (2002). Covert communication in classrooms, clinics, courtrooms, and cubicles. *American Psychologist, 57,* 839-849.

Spottiswoode S. J. P. & May E. C. (2003). Skin conductance prestimulus response: Analyses, artifacts and a pilot study. *Journal of Scientific Exploration, 17*, 617–641.

Smith, M. D. (1998). PhD. Thesis, University of Hertfordshire.

Tegmark, M. (2003). Parallel universes. In eds. J.D. Barrow, P.C.W. Davies & C. Harper (Eds.), *Science and Ultimate Reality*, Cambridge University Press.

Trillenberga, P., Verlegera, R., Wascherc, E., Wauschkuhna, B. & Wessela, K. (2000). CNV and temporal uncertainty with “ageing” and “non-ageing” S1— S2 intervals. *Clinical Neurophysiology, 111*, 1216-1226.

van Boxtel, G. J. M. & Böcker, K. B. E. (2004). Cortical measures of anticipation. *Journal of Psychophysiology, 18,* 61–76.

Walter, W. G., Cooper, R., Aldridge, V. J., McCallum, W. C., & Winter, A. L. (1964). Contingent negative variation: An electric sign of sensorimotor association and expectancy in the human brain. *Nature, 203*, 380–384.

Warren, C. A., McDonough, B. W., & Don, N. S. (1992). Event-related brain potential changes in a psi task. *Journal of Parapsychology, 56,* 1-30.

MEMORY, EMOTION AND THE RECEPTIVE PSI PROCESS

Richard S. Broughton
Division of Psychology, School of Social Sciences
The University of Northampton
Northampton NN2 7AL, UK

ABSTRACT

The two-stage model of receptive psi—ESP, anomalous cognition—is generally accepted as a reasonable starting point for understanding how ESP enters consciousness and affects behaviour. While stage one—how ESP "gets into the system"—remains a mystery and a likely problem for physics, stage two is thought to involve what Tyrrell has described as, "cognitive and other processes that we are not in the habit of calling paranormal." If evolution has conferred upon humans the ability to make use of anomalous information then it is likely to follow the pattern of brain development in which existing systems are adapted and enhanced to confer new advantages and adaptations.

Roll and Irwin have proposed memory as a likely candidate for one such brain system co-opted for service with ESP. The images that form the basis of spontaneous cases of ESP via dreams or hallucinations seem to be drawn from the recipients' memory, as are the responses in free-response ESP experiments. This raises the question of how are the particular memory images that bring the anomalous information to awareness selected?

This paper proposes that the emotional system also plays a role in receptive psi, perhaps an even more fundamental one than memory, though it operates closely with memory. Recent research suggests that the emotional system is intimately involved in the selection of the memory images that comprise dreams, as well as biasing the attentional resources we devote to the various memory images that parade across consciousness. The work of Damasio has highlighted the role of the emotional system, especially the feeling component, in decision-making, thus providing a link with the range of behavioural responses that might be psi-influenced in Stanford's PMIR model, as well as providing insight into the intuitive class of spontaneous cases. Evolution has already designed much of the emotional system's operation to be automatic, unconscious, and not easily subject to intentional control, characteristics traditionally attributed to receptive psi, so it would not be surprising that this system might be adapted by evolution to serve as a "pathway" for anomalous information.

The rapidly advancing understanding of the emotional system calls for new and imaginative experiments to examine the joint roles of memory and emotion in the effective use of anomalous information. Recent research on presentiment and ESP-based intuition are promising approaches, but, as always, more work is needed.

In the effort to understand the receptive psi process—ESP, anomalous cognition—parapsychologists have traditionally seen it as involving two stages. In the first stage, information from a distant, sensorially isolated, or future event enters the human system. In the second stage, the information is elaborated into conscious awareness and/or a behavioural response. In this conceptualization, stage one involves some form of anomalous information transfer. There is, of course, considerable debate within certain models as to whether the psi process can involve information transfer, however, there is no avoiding the fact that in operational terms, the human organism at the receiving end responds as if anomalous information has been acquired. In any case, there is reason to expect that explanations of the stage one component are likely to come from the domain of physics. It is with stage two that some conceptual and experimental progress has been made within parapsychology, psychology, and neuroscience.

The two-stage model of receptive psi was first articulated by Tyrrell (1946) who drew a distinction between *process* and *product* in what he termed "paranormal cognition." The *process* is the "reception" of the telepathic (or otherwise paranormal) information, which he notes is always unconscious. The *product* is the elaboration of the information into conscious awareness. Tyrrell notes "*The product of the paranormal cognitive process is not paranormal…*The product of the paranormal cognitive process is also the product of cognitive and other processes which we are not in the habit of calling paranormal" (Tyrrell, 1946, p. 68).

Tyrrell argued that paranormally acquired information was brought to conscious awareness by "mediating vehicles" such as dreams, hallucinations, or mental images. Later, Louisa Rhine adopted a similar two-stage model to understand the different types of spontaneous cases in her collection (Rhine, 1978), and to a large degree the two-stage model has become accepted as a reasonable starting point for explanatory theories. Irwin (1999) calls the stages the mediation and the experiential phases of psi. This paper will deal with the experiential phase by revisiting an existing model and suggesting an expansion of that model based on recent developments in neuroscience.

As Tyrrell noted, the second or experiential stage of the psi process is not paranormal. It involves quite normal cognitive and emotional processes, and various investigators have offered suggestions for key components of the process (see Stokes, 1997, p. 48 ff). Thus, half the challenge we face in understanding how psi works involves understanding its pathway through the normal operations of the brain and perhaps other systems of the organism.

Nearly two decades ago I suggested that if we wanted to know how psi worked it would help to know what psi was for (Broughton, 1988). I suggested that, as a start, we should look to the same process that has shaped homo sapiens into the most successful species on the planet—evolution. Evolution has a simple answer for the purpose of psi. It should have a role in improving our fitness, our ability to survive and to pass on our genes to the next generation. In short, psi must be useful. (For an elaboration of this idea, see Broughton, 1988; 2000.)

One of evolution's distinguishing characteristics is that it is a remarkably economical process. Evolution tends not to devise new systems where existing systems can be adapted and extended to serve new needs and confer new advantages. The human brain is built upon the substrate of a reptilian brain which now remains a crucial part of what it means to be human. New functions are typically "piggybacked" on existing systems that they can enhance.

An important key to the evolutionary fitness of homo sapiens has been our ability to acquire and store information, and to use it to plan future action based on our assessment of likely outcomes. We are essentially a future-oriented species. If evolution were to endow humans with an ability to capitalize upon anomalous information (however stage one operated) then it would be reasonable to expect that this ability would be built upon and tightly integrated with brain systems that serve this crucial fitness characteristic.

MEMORY AND ESP

One such brain system has already been identified—memory. The early SPR researchers, when faced with such vexing problems as. "Why do ghosts wear clothes?" or "How can there be apparitions of living individuals?" largely agreed that these experiences were hallucinations, perhaps mediated by telepathy (Gurney, Myers, & Podmore, 1886; Myers, 1903). There was an awareness, if not a consensus, that apparitional experiences were essentially a product of the mind of the percipient—an hallucination constructed from images in the percipient's memory. Warcollier's extensive naturalistic telepathy experiments in the 1930s confirmed this for him as he concluded,

> We must admit, as a starting point, that the images which appear to the mind of the percipient under the form of hallucinations, dreams, or more or less well-formed images, spring exclusively *from his own mind,* from his own conscious or subconscious memory. *There is no carrying of the visual impression from the agent to the percipient…* (Warcollier, 1939, p. 133, italics in original).

William Roll (1966) was the first to develop a comprehensive memory theory of ESP. Roll argued that ESP responses consisted of revived memories. In his model there is an anomalous input or trigger (stage one or mediation phase), but thereafter the ESP experience is based upon the contents of existing memory. Roll draws a comparison with ordinary sensory input, which is processed by comparing it with existing memory, and the extrasensory experience which arises *solely* from memory. Once evoked, according to Roll, the ESP-triggered memories are subject to the same mental processing as are ordinary memories on their way into consciousness.

The most fully developed memory model of ESP has been advanced by Harvey Irwin (1979). Irwin notes that there are two main approaches to understanding the experiential phase of ESP. One approach is sensory-like (or "pseudo-sensory" in Irwin's terminology) which is embodied in the notion of a "sixth sense." Schmeidler (1991) has proposed a model of ESP based upon the idea that ESP is a sensory-like process. However, Irwin's extensive analysis of spontaneous cases and laboratory research (Irwin, 1979, 1980) led him to conclude that "…the available evidence does not encourage a view that extrasensory information receives the same sorts of processing as sensory input" (Irwin, 1999, p. 166). The typical characteristics of sensory stimuli, e.g., its discriminability, have no systematic effect on performance in ESP tests. While not ruling out sensory models, Irwin believes that the weight of the evidence points toward memory-based models that involve what he calls "ideational" processing. In Irwin's model, the ESP-evoked memory information goes through several stages of unconscious or preconscious processing that will determine whether or not it emerges into consciousness in much the same way that sensory information would be processed (Irwin, 1979).

I am in general agreement with Irwin's assessment, but I think it should be noted that the lack of sensory processing characteristics may be more a function of the amount of information involved in stage one of the process. Because some types of ESP experience involve imagery there is a tendency to assume that the anomalous input at stage one is a high bandwidth process that conveys a large amount of information. In fact, stage one may involve a very low bandwidth channel that conveys very little information, but a sufficient amount to activate the appropriate systems that can elaborate the message into human consciousness. Thus the initial pathway into the human information processing system may resemble subliminal perception or perception without awareness, rather than ordinary sensory processing, as has been suggested by some investigators (see, for example, Roney-Dougal, 1986; Schmeidler, 1986; Wilson, 2002). Although considerations of channel capacity for stage one remain speculative, the evidence suggests that the apparently information-rich component images of a psychic experience arise from within the system.

One of the obvious characteristics of ESP information is that it is new to the recipient. Irwin notes, however, that this does not mean that information not already in memory is involved. A psychic experience that informs one that a good friend has just died obviously would not activate a memory of the friend dead, but would likely activate networks of memories that involve the friend, death in general, and perhaps the manner in which one is likely to die. ESP activates and links the discrete components that give rise to new information by their conjunction. This sort of experience is often accompanied by the distinct awareness that the ESP-triggered memory images are suddenly intruding in mental activity that was directed elsewhere.

If this conjecture is correct, then it can account for the fact that ESP information is often frustratingly incomplete. The recipient simply may not have the memories needed to complete the picture, or perhaps for whatever reason, the ESP trigger is unable to cause some links to be made.

Irwin (1979) has also considered what type of memory is involved in ESP. It seems clear that the type of memory involved in the ESP process is long-term declarative memory. The spontaneous cases suggest that the memories are primarily visual and generally concrete rather than abstract. Irwin observes that in a number of experimental and quasi-experimental studies it is the structure of the target that seems to come through. Semantic memories, as such, do not seem to be activated. If any semantic information emerges it is usually at a later stage when the subject attempts to interpret the images he or she has experienced. Warcollier's extensive naturalistic telepathy experiments led him to conclude, "It is not the meaning which is transmitted, but the image" (Warcollier, 1939, p. 131). Upton Sinclair's experiments with his wife as subject (Sinclair, 1962), repeatedly produced examples of strikingly close reproductions of the target material, but which Mrs. Sinclair could not identify at all. Contemporary research experience confirms these observations. Early in the remote viewing research programme scientists realized that the sketches and drawings the remote viewers made were likely to be more useful and accurate than the viewer's effort to interpret his or her impressions verbally. This led to the standard operating procedure to remind the remote viewers to just draw their images—not to try to interpret them.[1]

[1] There will certainly be specific examples that appear to contradict this conclusion. One example is Roll and Persinger's (1998) observation on the childhood experience of noted psychic Sean Harribance, who reportedly started doing very well in school where he picked up material telepathically, except from his Latin and French teachers supposedly because he had no memories of those words. More detailed analysis of this and other cases would be required before it could be determined if these really represented strongly conflicting evidence, or just an indication of expected individual differences or age-related differences in the general pattern of the type of memory favoured by psi.

While I agree with Irwin that semantic memory seems to play little or no part in ESP, I think more than mere structural elements are involved. I think the evidence, particularly from the dream research and the ganzfeld experiments, indicates that complete images of objects, scenes, or individuals are often activated. I am inclined to think that the basic memories that underlie the ESP process when it arises into consciousness are primarily visual images, but I don't think this is far from Irwin's notion.

THE EMOTIONAL SYSTEM AND ESP

The memory-based models of ESP, especially Irwin's comprehensive information processing model (Irwin, 1979), offer an important framework within which to understand how psi operates (Edge, Morris, Palmer, & Rush, 1986, pp. 191 ff). After an initial burst of experimental activity yielding somewhat ambiguous results interest waned and there has been little research employing contemporary experimental techniques to investigate the role of memory in the ESP process. In recent years, however, research in neuroscience and parapsychology has revealed another brain system that may be involved in the transduction of anomalous information into human consciousness or human behaviour—the emotional system of the human body.

At the outset, it is important to note that I am not merely referring to the affective content of experimental targets or the relationships between persons involved in a psi experience. I wish to focus on the neural systems that underlie human emotion, broadly defined, in the same way that memory models of psi implicate the cortical circuitry that makes memory possible.

In an evolutionary context, the emotional system is, of course, the foundation of that most fundamental survival adaptation, the fight or flight response, and, through the operations of the amygdala is designed the detect threats and danger and to initiate responses automatically. This is an evolutionarily old system that we share with virtually all vertebrates. LeDoux (1996) argues that it is precisely the merging of the emotional and cognitive systems that has conveyed our immense evolutionary advantage because it allows us to shift from simple autonomic reactions to planned actions. Damasio (1994) has further shown that the emotional system plays a major role in the action planning phase. It does this by biasing the selection of memory images that show us those options, thus constraining choice to a range already "pre-selected" by emotional system. Damasio's somatic marker hypothesis (which I shall later argue offers a very promising framework in which to see the possible operation of anomalous information in consciousness) is based upon a very close working relationship between the emotional system and memory (Broughton, 2002).

The working of memory and emotion in the ESP process may be most clearly seen in spontaneous cases, which is a logical source of data if we place ESP in an evolutionary context. Spontaneous cases of ESP fall naturally in three main categories, and although exact proportions differ between the major collections, some general conclusions can be drawn. Dreams form between one-third and two-thirds (in the L.E. Rhine collection) of all spontaneous cases, followed by intuitive cases and waking hallucinations (Stokes, 1997).

The dreaming state has long been seen as a fertile source of ESP-based information (Ullman, Krippner, & Vaughan, 1989). The dreaming state seems particularly suited to facilitate the arranging and combining of memory images into new patterns and episodes. This feature is fundamental to psychoanalytic theory and is a well-known component of creativity and problem-solving. It is not a big step to see dreams as an ideal workspace in which some form of ESP input can influence the assembly of the various memory images needed to present new and potentially important information to consciousness. Louisa Rhine divided the ESP dream experiences into two categories: realistic and symbolic. Two examples from the thousands on file will serve to illustrate how memory and emotion may underlie the ESP process.

The first case comes from a streetcar (tram) driver in Los Angeles. He reported an extremely realistic and detailed dream in which he was driving a tram on the W line loaded with passengers.

> "All the things in the dream were as they actually were; I mean the streets, stores, traffic conditions. Everything was in the dream just as they were in real life." Crossing an intersection he saw a northbound number 5 streetcar and waved to the motorman as he passed. "Suddenly, without warning a big truck, painted a solid bright red, cut in front of me … and the truck making the illegal

> turn could not see my car because of the other streetcar. There was a terrific crash. People were thrown from their seats and the truck overturned." Two men from the truck lay dead on the pavement and the driver walked up to a woman from the truck who was screaming in pain. She looked at the driver with what he described as the "largest, bluest eyes I had ever seen" and repeatedly shouted, "You could have avoided this."
>
> The driver awoke from his dream soaked in sweat and very shaken. Later when he arrived at work he was assigned to the W line and had forgotten about the dream. On his second trip of the day he was at the intersection from his dream with a full load of passengers.
>
> I was waiting for the signal to change, still not thinking of the dream, when suddenly I became sick to my stomach. I was actually nauseated. I felt provoked at myself and hoped it would go away. As I left the intersection on the signal change, I saw, just as in my dream, a Number 5 car, northbound. Now I was definitely sick. Everything seemed to have happened before, and my mind seemed to be shouting at me about something. When I waved to the motorman on the "5" car, the dream came to me. I immediately shut off the power and applied the brakes, stopping the car. A truck, not a big truck completely red as in my dream, but a panel delivery truck, with the space for the advertising on the side painted over with bright red, shot directly in my path. Had I been moving at all, I would have hit it as surely as I did in the dream.
>
> There were three people on the truck, two men and a woman. As the truck passed in front of me, the woman leaned out of the window and looked up at me with the same startled, large blue eyes I had seen in my dream, and…waved her arm and hand, thumb and forefinger circled in the familiar "okay" gesture.[2]

This is an example of a realistic case and it is easy to see that most of the dream consisted of the driver's well-established memories of the streetcar route and the situations he normally encountered. The part of the dream that appears to be of an event that has not yet taken place seems to be assembled from his memories of other vehicles, people and possible scenarios. Although he may not have had the memory of a streetcar collision as such, it would be a simple matter to construct a plausible scenario from existing memory images just as anyone could imagine an auto accident happening. It is interesting to note that not all images of the unexpected event were accurate (the truck) but they were sufficient to get the message across.

The second illustration is a symbolic dream from a woman whose son was in the Navy in the South Pacific Theatre during the Second World War. "I dreamed that my young son, an only child…came to me while I was busy in the kitchen and handed me his uniform which was sodden, soaking, and dripping wet. He had a most distressed expression on his young face..." The woman's dream continued with her wringing the water out of her son's uniform but her son took it from her and dropped it into the laundry tub and took her into his arms and said, "Isn't this terrible! Oh, Mom—it's all so terrible!" In the dream the woman reminded her son that nothing was so terrible that they could sit down and talk it through, and the two of them went into the living room and the woman sat down and her son sat in her lap, and, as these things happen in dreams, the son turned into an infant as she rocked him and the dream soon ended. In due course the woman learned that her son's ship had been torpedoed on the very night that she had the dream and that her son and 250 others had been killed in a massive explosion of ordnance that resulted (Rhine, 1961, p. 49).

Again, the dream images are all drawn from memory images or the plausible manipulation of image components. It is classified as a symbolic dream because it is far from a representation of the related event. One can only speculate as to why some psychic dreams are symbolic. Some have argued that the symbolic nature might be a way of cushioning bad news, or as a result of repression mechanisms, but an equally likely explanation could be that for this woman the images needed to construct a realistic scenario of the carnage of a torpedoed munitions ship were simply not available and the "message" was carried through other images. This example came from a time before television, of course, and the images that the public saw in theatres and elsewhere were carefully controlled during the war.

The special relationship between memory and dreaming is an area of much research and considerable debate today (Hobson, Pace-Schott, & Stickgold, 2000; Stickgold, Hobson, Fosse, & Fosse, 2001). Sleeping and dreaming seems to enjoy a two-way relationship with memory. Memory is obviously the

[2] From the LE Rhine collection, quoted in Broughton (1991, pp. 20–21).

source of the content of dreams, but dreams, and more generally, sleep, play a role in the consolidation and strengthening of long-term memory.

Precisely what the sources of the memories for dreaming are and how they are selected remains uncertain. Increasingly, researchers now see dreams not simply the result of more-or-less random brain activity, but a form of meaningful memory processing (Paller & Voss, 2004; Revonsuo, 2000). There is growing evidence that the emotional system plays an important role. Recent research shows that during REM sleep the dorsolateral prefrontal cortex is deactivated and the hippocampal formation processes minimal output, which means that structured episodic memories are not involved, while the visual association area and associated paralimbic projections operate in something of a close loop disassociated from outside sensory input (Braun et al., 1998). Traces of episodic memory are involved in strange and seemingly unpredictable ways (Nielsen & Stenstrom, 2005). Also, during REM, the central nucleus of the amygdala and limbic forebrain structures are activated contributing substantial input from the emotional system (Stickgold, Hobson, Fosse, & Fosse, 2001). Stickgold et al. note, "… although emotions appear to play an important role in the selection of memories for incorporation into dreams, the dreams themselves often show little or no emotional content." (Stickgold, Hobson, Fosse, & Fosse, 2001, p. 1056). The particular combination of brain activity that occurs during dreams may be suited to the creative and problem solving activity associated with sleep and dreams (Wagner, Gais, Haider, Verleger, & Born, 2004), and it may provide a suitable canvas upon which the memory images needed to convey anomalous information can be painted.

The second largest type of spontaneous ESP in most of the collections is the intuitive impression, representing a little more than a quarter of the cases. Intuitive impressions often amount to a sudden hunch or an unexpected awareness that something of consequence has happened (usually to someone connected to the person who has the experience). The cases are often described as "just knowing" and are unaccompanied by any imagery or reasoning process. A typical example of an impression case would be when a mother suddenly "knows" that something has happened to her child and drives to the school where she learns that her child had just had an accident in the playground. Many of these impressions are accompanied by strong emotional feelings, often anxiety or dread. A significant number of cases involve only the feelings, with no cognitive content to explain them. Consider this case from a young man in California.

> One night in July of 1951 we had just finished supper, and my brother-in-law was getting ready to go to a meeting in San Jose, which is twenty-five miles from our house. For no reason I started crying, me, crying, twenty-five years old! I begged him not to go. Well there was quite a fuss and I got everyone upset. Mom kept saying, "He will be all right." You know, the usual soft soap you give an upset person. This went on for about fifteen minutes. Then the feeling left me, and I said, "It's all right for Bob to go now."
>
> By this time the fellow he was to ride with had waited at their meeting place, but left before Bob got there, so Bob had to drive his own car down. He got as far as Bayshore and Charter Streets, when the traffic began to back up. A wreck, which is nothing unusual around here, but when Bob got to the corner, he said he almost passed out. There spread out on the highway was the man he was to have ridden with; his head was half gone. The car was a total loss. They found later that his brakes had locked on one side, and he flipped up in the air and came down on the other side of the road to be hit head-on by another car. (Rhine, 1961, p. 127)

This is a striking example of a case where the unexpected onset of strong feelings—with no images or other information—managed to prevent a family tragedy. It must be remembered that this is just one example of a somewhat neglected type of spontaneous case. Stevenson (1970) has noted several examples.

On first inspection, intuitive cases may seem to present a problem for memory models since they seem to involve neither memory nor images, but that would be misleading. At any given moment the contents of consciousness are images, some sensory, others drawn from memory. During periods of low sensory input, memory images will dominate. These images are held in working memory for periods from a fraction of a second to several seconds. The mechanism of basic attention holds a particular image in working memory more or less to the exclusion of other images. As part of his somatic marker hypothesis Damasio (1994) argues that the emotional system, working in concert with the prefrontal structures of the brain, plays a major role in the generation of the particular images that play across consciousness and in determining which images receive the focus of our attention. When this unconscious process leads to sudden conclusions or decisions, it will feel like intuition because the solution or the decision will seem to have just "popped" into mind. In fact, a subtle interplay of learned emotional experience and memory will have been behind the process, but that will all be hidden from conscious awareness.

A particularly interesting feature of many of the intuitive cases is that they involve strong emotional feelings. Damasio (1994), LeDoux (1996), and others have shown that in addition to declarative memory a person has emotional memory. These are memories that can set our bodies in the physical states—the feelings—associated with past experiences. These memories of feelings are the somatic markers that underpin decision making and planning in Damasio's somatic marker theory. Cases such as the young man whose teary outburst delayed his brother-in-law's departure provide a most important clue to the process in that they seem to represent a direct activation of feelings with no cognitive content at all.[3]

The last of the main classes of spontaneous case is that of the waking hallucination or quasi-sensory image. Hallucinations frequently involve individuals, sometimes deceased, but often living individuals, and animals are not uncommon. Often hallucinatory cases convey useful information, frequently related to unwelcome occurrences such as deaths or illnesses of family of friends, but it relatively trivial hallucinations are reported as well. In another Second World War example, an American soldier had been driving a car with several officers on an inspection tour of the front lines. Just before starting the return journey, another soldier told him of a short cut back to the base. He found the shortcut and began driving down the road when suddenly he saw a friend waving him to stop, telling him to go back the way he came. Without thinking much of it, he backed up the car, taking care to avoid a truck full of marines waiting to go down the same road. Only when he was nearly back at the base did he realize that the friend who had just directed him back to the main road had, in fact, been killed a couple of weeks earlier. The next day when the casualty reports came in, the driver learned that the truckload of marines that he had taken care to avoid had hit a mine on the road he almost went down, and all were killed.

Hallucinations, of course, involve memory images, but masquerading as sensory input. The images are most commonly visual, but also can be auditory or involve other senses. The hallucinations that comprise spontaneous cases are also quite unlike the recurrent hallucinations associated with clinical and neurological conditions. They usually are isolated events in normal individuals.

The aetiology of hallucinations in the clinical and non-clinical populations is also the subject of much research and debate (see Collerton, Perry, & McKeith, 2005, and accompanying commentaries) The prevailing models for hallucination generally involve deficiencies or malfunctions in attributing the source of images in short term memory (Bentall, 2000; Collerton, Perry, & McKeith, 2005). In these models, images from internal sources are incorrectly attributed to external sensory input. More recently, speculation has grown that waking hallucinations may have their origins in the same mechanisms that underlie dreaming (Gottesmann, 2005; Ingle, 2005; Mahowald, Woods, & Schenck, 1998; Pace-Schott, 2005).

However hallucinations are triggered, there is little doubt that the images are drawn from, or constructed from, schema held in long-term memory. In psychic hallucinations, what is it that selects the particular memory images that convey the message? At this stage the answer to that question can only be speculative, but, again, Damasio's somatic marker hypothesis provides some intriguing clues. A fundamental component of his model is the role of the emotional system in selecting the images to which we attend, and the evolutionary roots of this system are in that part of the brain concerned with threat detection and survival reactions. That system has evolved mechanisms to bias and influence the attentional resources we deploy to the images that represent our options for action (Damasio, 1994, 1996). Once again, returning to the evolutionary context, if evolution has provided humans with a system designed for fast automatic processing of survival-related information, would it not make sense for it to incorporate

[3] The various collections contain a number of cases that seem to straddle the border between intuitive/emotional and hallucinatory. These are the so-called "somatic cases" in which a person experiences strong and typically rather specific pains that prove to be related to the death or injury of a loved one. As with the intuitive cases, the somatic cases suggest that the relevant anomalous information is communicated either to the body or the relevant pain centers of the brain without engaging any cognitive processes.

psychic information if and when it is available? Evolution may simply have found that the way to present psi information during ordinary waking consciousness may be to "superimpose" suitable memory information on ongoing sensory processing.

ESP AND BEHAVIOUR

The chief feature of most spontaneous cases in the collections is that they seem to convey information, although in many of them the information subsequently results in changes in behaviour. This has lead to a not unreasonable assumption that the primary purpose of ESP is to convey anomalous information to consciousness. However, a case can be made that, in an evolutionary context, a principle function of ESP might be to guide or change an individual's behaviour in adaptive and survival-oriented ways (Broughton, 1988). The most thoroughly developed version of this view is Stanford's psi-mediated instrumental response (PMIR) model (Stanford, 1974, 1990).

The PMIR model begins from a fundamental assumption that psi operates at an unconscious level to serve human needs by disposing an individual toward adaptive responses to environmental situations based on the acquisition of need-relevant information through a non-sensory channel. The model views psi as an active component of human behaviour, in that it will make use of whatever relevant information it can acquire to serve the needs of the organism. In that respect, psi is similar to our sensory systems, and the needs that Stanford sees psi serving are the same needs that the organism would respond to if sensory information were available (Stanford, 1990, p 60 ff.).

Within the PMIR model there are a variety of ways in which psi can accomplish its goal. It can involve changes in motivational or emotional arousal, or the focusing of attention, and it happens unconsciously and generally without awareness of anything extraordinary taking place. Stanford states,

> PMIR is accomplished through psi-mediated facilitation, release or triggering of behaviors, feelings, images, associations, desires, or memories that are already in the repertory of the organism and that can aid in the production of an instrumental response or that can be such a response. (Stanford, 1990, p. 102)

Although PMIR consists of assumptions, albeit very reasonable ones if one accepts the basic premise that psi is meant to be evolutionarily useful, Stanford has also amassed a large amount of experimental and anecdotal evidence that provides support for his model (for a full account see Stanford, 1990). At the time of its genesis, it was difficult to conceive of a brain system with which psi information could interact so as to effect such a wide range of behaviours. Today, thanks largely to the pioneering work of Antonio Damasio, it appears that there is a brain system that would fit the job quite nicely—the emotional system.

The emotional system has long been known to underpin defensive, survival-related reactive behaviour, as in the fight or flight response, and more recently, the general role of the emotional system in matching bodily responses to environmental demands through interactions with higher cortical areas is beginning to be understood (LeDoux, 1996). The important work of Damasio and his colleagues highlighted the crucial role the emotional system plays in decision making, a realm that has heretofore been considered the province of the rational (cortical) mind (Damasio, 1994). Formalized as his somatic marker hypothesis (Bechara, Damasio, & Damasio, 2000; Damasio, 1994, 1996), Damasio's model shows how various components of our emotional system interact with memory and other brain systems to produce a highly efficient, rapid-responding, decision-making system ideally suited to the evolutionary survival of humans.

In the somatic marker hypothesis, whenever stimuli are encountered in the environment, the memory of that encounter includes not just the sensory and cognitive aspects, but also the state of the body (the viscera, primarily) that was associated with the emotional reaction to that encounter. This is the somatic marker for that mental datum. An encounter with a snake is likely to be associated with a somatic state that includes all aspects of a fear response (sweaty palms, racing heart, queasy stomach), while an encounter with an individual of possible romantic interest might engender a different set of positive emotional responses in the body. When the images of that encounter are recalled, so are the somatic markers (though this is probably not conscious). The somatic marker hypothesis posits that one of the inputs to human reasoning and decision-making is a memory or re-experiencing of the emotional body states (feelings) that prior experience has associated with the specific aspects of the decision or matter under consideration.

Somatic markers serve to generate order and priorities even in the most subtle reasoning processes by biasing the amount of attention we pay to the contents of the images that we hold in working memory for fleeting instants in the process. By thus constraining the options available for any given decision the emotional system reduces a potentially very large number of options to a range that is more manageable for a logical and cost-benefit analysis. The process is likely to be unconscious, and fast, and it would feel very much like intuition.

This in no way is meant to suggest that the somatic-marker hypothesis in some way explains ESP, or that ESP is part of the process. It is simply one model based on a growing body of knowledge about the workings of the emotional system that suggests emotions could play at least as large a role as memory in the process of translating anomalous information into useful knowledge or adaptive behaviour in humans. The operations of the emotional systems, as revealed by the work of LeDoux, Damasio, and others shows that it plays a key role in the selection of the memory images that could form the substrate of the informational spontaneous cases, and equally it plays a role in the decisions and behaviour that would represent psi operating within Stanford's PMIR.

The operation of the emotional system is, of course, unconscious, thus conforming to one of the characteristics commonly imputed to the psi process. Furthermore, an intriguing suggestion lies in what we often think of as one of the great problems with research in this area—our inability to control the use of psychic information. Spontaneous cases are just that—spontaneous. They come of their own accord—one does not make them happen. In the laboratory psi is notoriously elusive and uncontrollable, and this is often attributed to its unconscious nature. In my evolutionary view of psi I argued that one of the characteristics we could expect of evolved psychic abilities would be that they are not subject to conscious control, because if they were they would be too easy to misuse in a way that was not conducive to survival in evolutionary terms (Broughton, 1988). At the time I could not think of a mechanism, but recently Dolan has noted that emotions "…are less susceptible to our intentions than other psychological states insofar as they are often triggered, in the words of James, 'in advance of, and often in direct opposition of our deliberate reason concerning them'" (Dolan, 2002, p. 1191). Indeed, it seems the very nature of the emotional system's operation as a survival response system and decision-making system is that it is *unconscious and independent of our intentions*. That is precisely the type of system by which psi information may best serve survival-related needs.

EXPERIMENTAL APPROACHES

Considerable research on the relationship between memory function and ESP followed Roll's initial proposal (See Blackmore, 1980, for a review.). Typically these experiments tested participants' memory abilities using standard memory tests of the time and compared this with ESP performance, usually tested via ESP cards. It is doubtful that most of this research provides any insight into the functional relationship suggested by Irwin's (1979) model or this paper. If anything, the most convincing evidence of the relationship between ESP and memory comes from the informal observations of experimenters using the ganzfeld technique. Virtually by design, the imagery produced in a ganzfeld session arises from the participant's memory, and the striking hits that are observed are due to the participant bringing forth a particular memory or image that "matches" the target material.

There has also been considerable research on aspects of emotion and ESP. Much of this research deals with the affective quality of target material and its influence on ESP scores, which is probably of little relevance to the role of the emotional system proposed in this paper. More promising is the presentiment research that suggests that emotionally driven components of the autonomic nervous system can anticipate unpleasant or threatening future events (Bierman & Radin, 1997; Bierman & Scholte, 2002; Radin, 2000, 2004), though alternative interpretations have not been ruled out (May, Paulinyi, & Vassy, 2005).

Clearly there is a need for new and creative experimental approaches that examine the role of memory in the psi process, and the possible, perhaps even likely, role that the emotional system plays in the selection of psi-relevant memory images. These experiments should be ecologically valid, especially in an evolutionary sense. Also needed is research into the role that the emotional system may play in generating the adaptive responses predicted by the PMIR model. Experiments examining the role of the emotional system in ESP-based intuitive decision-making is currently under way at our laboratory and that of Professor Bierman in Amsterdam (Bierman, 2004), but additional independent research approaches are needed.

Conclusions

Within the context of the two-stage model of receptive psi it should be expected that evolution would have adapted existing brain systems to capitalize on anomalous, psi-based information in order to serve survival goals. The memory system has been identified as the brain system that mediates anomalous information into conscious awareness, but the issue of how the particular memory images are selected remained unaddressed. The recent and rapidly growing understanding of the role that the emotional system plays in determining the imagery contents of consciousness through its interaction with memory suggests that this system could play a key part in getting the psi "message" through. Furthermore, the emotional system is now understood to be a fundamental component of our decision-making at all levels, thus providing a plausible connection with the psi-mediated adaptive behaviour predicted by the PMIR model. Finally, the substantial number of spontaneous cases that seem to consist solely of emotional feelings further suggests that the emotional system may be the "root" system by which anomalous information can begin to effect change in the human system via multiple pathways. Some pathways might involve interaction with the emotional system and memory, or the direct triggering of the feeling component of emotions, or by the biasing of decisions in an adaptive or need-serving manner. If emotion and memory have been selected by evolution to make use of anomalous information then the emotional system component would go a long way to explaining the unconscious and uncontrollable nature of receptive psi and together they may advance the understanding of stage two of the receptive psi process.

References

Bechara, A., Damasio, H., & Damasio, A. R. (2000). Emotion, decision making and the orbitofrontal cortex. *Cerebral Cortex, 10*(3), 295–307.

Bentall, R. P. (2000). Hallucinatory experiences. In E. Cardeña, S. J. Lynn & S. Krippner (Eds.), *Varieties of anomalous experience: Examining the scientific evidence* (pp. 85–120). Washington, DC: American Psychological Association.

Bierman, D. J. (2004). *Non conscious processes preceding intuitive decisions.* Paper presented at the Bial Foundation 5th Annual Symposium: Aquém e Além do Cérebro (Behind and Beyond the Brain), Porto, Portugal.

Bierman, D. J., & Radin, D. I. (1997). Anomalous anticipatory response on randomized future conditions. *Perceptual and Motor Skills, 84,* 689–690.

Bierman, D. J., & Scholte, H. S. (2002, August 5–8). *Anomalous anticipatory brain activation preceding exposure to emotional and neutral pictures.* Paper presented at the Parapsychological Association, 45th Annual Convention, Paris.

Blackmore, S. J. (1980). Correlations between ESP and memory. *European Journal of Parapsychology, 3,* 127–147.

Braun, A. R., Balkin, T. J., Wesensten, N. J., Gwadry, F., Carson, R. E., Varga, M., et al. (1998). Dissociated pattern of activity in visual cortices and their projections during human rapid eye movement sleep. *Science, 279*(5347), 91–95.

Broughton, R. S. (1988). If you want to know how it works, first find out what it's for. In D. H. Weiner & R. L. Morris (Eds.), *Research in Parapsychology 1987* (pp. 187–202). Metuchen, N.J.: Scarecrow Press.

Broughton, R. S. (1991). *Parapsychology: The controversial science*. New York: Ballantine.

Broughton, R. S. (2000). From caveman to the Second Foundation: Making sense of exceptional experiences. In *Aquém e Além do Cérebro Symposium (Behind and Beyond the Brain)* (pp. 69–82). Porto, Portugal: Fundação Bial.

Broughton, R. S. (2002). Telepathy: Revisiting its Roots. In *4º Simpósio da Fundação Bial: Aquém e Além do Cérebro: Relações Interpessoais Excepcionais.* (pp. 131–146). Porto: Fundação Bial.

Collerton, D., Perry, E., & McKeith, I. (2005). Why people see things that are not there: A novel Perception and Attention Deficit model for recurrent complex visual hallucinations. *Behavioral and Brain Sciences, 28* (06), 737.

Damasio, A. R. (1994). *Descartes' error: Emotion, reason, and the human brain*. New York: G. P. Putnam's Sons.

Damasio, A. R. (1996). The somatic marker hypothesis and the possible functions of the prefrontal cortex. *Philosophical Transactions of the Royal Society of London, B, 351*, 1413–1420.

Dolan, R. J. (2002). Emotion, Cognition, and Behavior. *Science, 298* (5596), 1191–1194.

Edge, H. L., Morris, R. L., Palmer, J., & Rush, J. H. (1986). *Foundations of Parapsychology*. Boston, MA: Routledge & Kegan Paul.

Gottesmann, C. (2005). Waking hallucinations could correspond to a mild form of dreaming sleep stage hallucinatory activity. *Behavioral and Brain Sciences, 28*(06), 766.

Gurney, E., Myers, F. W. H., & Podmore, F. (1886). *Phantasms of the living* (Vol. 1). London: Trubner.

Hobson, J. A., Pace-Schott, E. F., & Stickgold, R. (2000). Dreaming and the brain: Toward a cognitive neuroscience of conscious states. *Behavioral and Brain Sciences, 23* (06), 793.

Ingle, D. (2005). Two kinds of "memory images": Experimental models for hallucinations? *Behavioral and Brain Sciences, 28*(06), 768.

Irwin, H. J. (1979). *Psi and the mind*. Metchen, N.J.: Scarecrow Press.

Irwin, H. J. (1980). Information processing theory and psi phenomena. In B. Shapin & L. Coly (Eds.), *Communication and parapsychology* (pp. 25–43). New York: Parapsychology Foundation.

Irwin, H. J. (1999). *An introduction to parapsychology* (Third ed.). Jefferson, NC: McFarland & Company, Inc.

LeDoux, J. (1996). *The emotional brain: The mysterious underpinnings of emotional life*. New York: Touchstone.

Mahowald, M. W., Woods, S. R., & Schenck, C. H. (1998). Sleeping dreams, waking hallucinations, and the central nervous system. *Dreaming, 8* (2), 89–102.

May, E. C., Paulinyi, T., & Vassy, Z. (2005). Anomalous Anticipatory Skin Conductance Response to Acoustic Stimuli: Experimental Results and Speculation About a Mechanism. *Journal of Alternative and Complementary Medicine, 11* (4), 695–702.

Myers, F. W. H. (1903). *Human personality and its survival of bodily death* (Vol. 1). London: Longmans, Green, and Co.

Nielsen, T. A., & Stenstrom, P. (2005). What are the memory sources of dreaming? *Nature, 437*, 1286–1289.

Pace-Schott, E. F. (2005). Complex hallucinations in waking suggest mechanisms of dream construction. *Behavioral and Brain Sciences, 28* (06), 771.

Paller, K. A., & Voss, J. L. (2004). Memory reactivation and consolidation during sleep. *Learning & Memory, 11* (6), 664–670.

Radin, D. I. (2000, 7/19/00). Evidence for an anomalous anticipatory effect in the autonomic nervous system. Retrieved July 22, 2002, from http://www.boundaryinstitute.org/articles/presentiment99.pdf

Radin, D. I. (2004). Electrodermal Presentiments of Future Emotions. *Journal of Scientific Exploration, 18*(2), 253–273.

Revonsuo, A. (2000). The reinterpretation of dreams: An evolutionary hypothesis of the function of dreaming. *Behavioral and Brain Sciences, 23*(06), 877.

Rhine, L. E. (1961). *Hidden Channels of the Mind*. New York: William Morrow.

Rhine, L. E. (1978). The psi process in spontaneous cases. *Journal of Parapsychology, 42,* 20–32.

Roll, W. G. (1966). ESP and memory. *International Journal of Neuropsychiatry, 2*, 505–521.

Roll, W. G., & Persinger, M. A. (1998, August 6–9). *Is ESP a form of perception? Contributions from a study of Sean Harribance*. Paper presented at the Parapsychological Association 41st Annual Convention, Halifax, Nova Scotia.

Roney-Dougal, S. M. (1986). Subliminal and psi perception: A review of the literature. *Journal of the Society for Psychical Research, 53*, 405–434.

Schmeidler, G. R. (1986). Subliminal perception and ESP: Order in diversity? *Journal of the American Society for Psychical Research, 80*, 241–264.

Schmeidler, G. R. (1991). Perceptual processing of psi: A model. *Journal of the American Society for Psychical Research, 85*, 217–236.

Sinclair, U. (1962). *Mental radio* (2nd ed.). Springfield, Il: Charles C. Thomas.

Stanford, R. G. (1974). An experimentally testable model for spontaneous psi events: I. Extrasensory events. *Journal of the American Society for Psychical Research, 68*, 34–57.

Stanford, R. G. (1990). An experimentally testable model for spontaneous psi events: A review of related evidence and concepts from parapsychology and other sciences. In S. Krippner (Ed.), *Advances in Parapsychological Research 6* (pp. 54–167). Jefferson, N.C.: McFarland.

Stevenson, I. (1970). *Telepathic impressions: A review and report of thirty-five new cases*. Charlottesville, VA: University Press of Virginia.

Stickgold, R., Hobson, J. A., Fosse, R., & Fosse, M. (2001). Sleep, Learning, and Dreams: Off-line Memory Reprocessing. *Science, 294*(5544), 1052–1057.

Stokes, D. M. (1997). Spontaneous psi phenomena. In S. Krippner (Ed.), *Advances in parapsychological research 8* (pp. 6–87). Jefferson, N.C.: McFarland.

Tyrrell, G. N. M. (1946). The *modus operandi* of paranormal cognition. *Proceedings of the Society for Psychical Research, 48*(173), 65–120.

Ullman, M., Krippner, S., & Vaughan, A. (1989). *Dream telepathy: Experiments in nocturnal ESP*. Jefferson, N.C.: McFarland.

Wagner, U., Gais, S., Haider, H., Verleger, R., & Born, J. (2004). Sleep inspires insight. *Nature, 427*(6972), 352–355.

Warcollier, R. (1939). *Experiments in telepathy*. London: George Allen & Unwin.

Wilson, S. (2002). Psi, perception without awareness, and false recognition. *Journal of Parapsychology, 66*(September), 271–289.

ANOMALOUS EXPERIENCES AND HYPNOSIS

Etzel Cardeña, Ph.D.

Lund University, Sweden

ABSTRACT

Throughout its history, mesmerism and its later development as hypnosis have been related to reputed psi-phenomena and to various alterations of consciousness. Although most of the older literature would not stand up to current methodological strictures, there are some reports that are still baffling and both the consistency of the reports and more recent meta-analytic work suggest that we should investigate the psi-hypnosis relationship more programmatically. With respect to alterations of consciousness within the hypnotic context, most previous work has had the confound of specific suggestions. In this paper I review the literature on hypnotic phenomenology, point out its limitations, and present recently published data that supports specific alterations associated with experienced depth: mostly relaxation during a resting baseline, mild to moderate changes in sensations and body image during light/medium hypnosis, and radical alterations of body image (e.g., floating, sinking), and dreamlike and transcendental (e. g,, merging with a light) during deep and very deep hypnosis. Many of these phenomena have also been observed during other altered states such as OBEs and NDEs, which have been of great interest to the parapsychology field.

MESMERISM, HYPNOSIS, AND PSI PHENOMENA

Ever since the exuberant collective healings of Mesmer in the Paris of the late eighteenth century, much has been speculated and researched about the collection of phenomena and techniques that we refer to as hypnosis. While there is growing interest on topics such as the therapeutic uses of hypnosis, other areas have been neglected in contemporary research, among them spontaneous anomalous experiences within the hypnotic context. An anomalous experience can be defined as a statistically uncommon alteration of consciousness (e.g., synesthesia), or one that, although not uncommon, seems to deviate from the culture's conception of reality (e.g., psi phenomena; Cardeña, Lynn, & Krippner, 2000). The gist of this paper will focus on spontaneous alterations of consciousness within the hypnotic context, including some recently published data, after a brief discussion of mesmerism, hypnosis and psi phenomena.

It is typically assumed that what we acknowledge as hypnotic phenomena and procedures derive from the techniques of the 18th Century physician Franz Anton Mesmer, albeit not from his theory of animal magnetism. This is debatable since Mesmer's procedures differed greatly from current hypnosis. They could involve music and a grand entrance by Mesmer himself, "magnetic passes" of the mesmerist's hands over the patient's body, or indirect contact through rods immersed in "magnetized" water. These sessions occurred in an emotionally charged setting in which there might be crying, fainting, and other dramatic behaviors, not very unlike the exorcisms that Mesmer wished to replace (Laurence & Perry, 1988). These manifestations became far more subdued after one of his disciples, the Marquis de Puységur, discovered that one of his "magnetized" peasants, Victor Race, went into what looked like a sleep-like state, in which he seemed to manifest a "wiser" self. Eventually, a model of physical quiescence and suggestions to relax and enter a sleep-like state became what we call nowadays hypnosis, although physically active inductions are effective and have their applications (Cardeña et al., 1998).

From its inception, reports started pouring in that mesmerism/hypnosis enhanced the creativity and paranormal abilities of hypnotically gifted individuals, allowing them to diagnose and prescribe for their own and others' maladies, demonstrate telepathy and clairvoyance, be hypnotized at a distance, and so on (Crabtree, 1988; Gauld, 1992). With few exceptions, such as the demonstrations by Alexis Didier and Mme. B in 19th century France, most earlier reports of enhanced paranormal abilities would not meet contemporary criteria for good scientific reporting and control (Gauld, 1992). There were enough suggestive observations, however, to justify Dingwall's (1967-68) remark concerning a possible connection between psi phenomena and hypnosis that "(A) n attitude of suspended judgment both as regards the past and the present is perhaps the most judicial" (V. 1, p. 297).

Most hypnosis researchers in the 20th Century made a concerted effort to eliminate any whiff of paranormality or esoterism, but there were still various controlled studies, although not programmatic research, on the reputed link between psi phenomena and hypnosis. Two meta-analyses of all published studies to that date provide a strong support of Gauld's assertion (1992) that the early mesmerism/hypnosis authors were "certainly on to something." Among the conclusions of the meta-analyses (Schechter, 1984; Stanford, 1992) are:

1) Psi scoring was higher in hypnosis than control conditions in 16 of 20 studies (p<.006, one tailed)

2) In 19 studies, psi scoring in the hypnosis condition was significantly higher than MCE (mean chance expectation) in 9 studies, and non-significantly higher in 6 others.

3) Methodological flaws did not relate significantly to results, although, as in some other areas of psi, there seems to be a significant experimenter effect (Stanford, 1992).

The possible relationship between hypnosis and psi was identified by Palmer (1987) as one of the strongest findings in parapsychology and deserves a full paper of its own. It is puzzling that it has not received more recent attention from the field. For instance, a question that deserves further research is whether reputed enhanced psi phenomena depend on a trait (high hypnotizability), a state (the hypnotic context), or an interaction between the two.

MESMERISM, HYPNOSIS, AND ALTERATIONS OF CONSCIOUSNESS

Whether or not interpreted as referring to psi phenomena, reports of alterations of consciousness were yoked to mesmeric and hypnotic procedures from the beginning, and there were attempts to categorize them. One of the most important hypnosis authors of the 19th Century, Kluge, described six degrees (what would be now called "levels") of the magnetic state, including phenomena such as "darkness", "self-contemplation," and "universal clarity" (Ellenberger, 1970). However, when reviewing the literature on phenomena described within hypnosis, a distinction must be made between consciousness alterations in response to specific suggestions and those occurring spontaneously. The former, such as in inductions of quasi-mystical experiences (e.g., euphoria, expansion of time and space, unspeakable beauty; Aaronson, 1967; Sacerdote, 1977) are of great interest, but they do not distinguish between the "artifact" (e.g., response to specific suggestions) of hypnosis and its "essence" (i.e., phenomena presumably intrinsic to hypnosis; Orne, 1959). Multifactorial experiential models of hypnosis involving increased suggestibility, lack of reflective awareness/dissociation, and alterations in consciousness/ absorption have been developed (Ås & Ostvold, 1968; Cardeña & Spiegel, 1991; Evans, 1963; Field, 1965), but there has been little research on hypnotic phenomenology, especially among very responsive individuals (Weitzenhoffer, 2000). This is a basic issue in the study of consciousness because hypnotizability has been positively correlated with mystical, psi-related, near-death, and other anomalous experiences (Cardeña, Lynn, & Krippner, 2000).

Gill and Brenman (1959) reported that while entering hypnosis many participants reported changes in body image (e.g., swelling of the head, mouth and arms) and body sensations (e.g., dizziness and sensations of floating), and a fading of the sense of external reality. As hypnosis continued, the specific configuration of the changes became more idiosyncratic. Ludwig (1965) gave a questionnaire to participants before and after a long hypnotic challenge procedure. In contrast with no-hypnosis, hypnosis fostered reports of phenomena such as a sense of unreality, merging with the surroundings, and unusual sensations, which the author interpreted as alterations in thinking and time sense, sense of loss of control, increased meaning, decreased affect, and changes in body image and somatic sensations. Ernest Hilgard (1968) interviewed 159 participants after their first standard hypnotic induction. Reports of unsuggested experiences included disinclination to speak, move or think, feelings of compulsion in response to suggestions, changes in body image (in appearance and size), changes in body sensations (e.g. dizziness, floating, spinning) and a similarity to sleep. More recently, Pekala (1991), using his standardized questionnaire, also found alterations associated with hypnosis in the following areas: body image and sensations, time sense, perception, meaning, affect, and imagery, besides a general sense of alterations in consciousness. As compared to hetero-hypnosis, self-hypnosis is characterized by greater imagery, free-floating attention, and receptivity to "internal stimuli" (Fromm et al., 1981).

Besides hypnotic experience in general, some authors have taken seriously the notion of levels of hypnosis and have researched alterations of highly hypnotizable people during "deep" levels of hypnosis. Perhaps the first well-known modern author to dedicate a work specifically to deep hypnosis was Milton Erickson (1952), who defined it as an "unconscious level of awareness without interference by the conscious mind." He described loss of contact with the body during plenary (very deep) hypnosis and explained it as a pattern of retarded psychological and physiological functioning with lack of spontaneity. In a later paper, Erickson (1965) wrote about the experiences of hypnosis and other altered states of the eminent consciousness author Aldous Huxley. The latter described the beginning of hypnotic experience as a withdrawal from outer reality concerns, characterized at later stages by changes in body sensation ending in synesthesia, a sense of loss of personal identity, and lack of mental content.

More systematically, Tart (1970) devised a deep hypnosis procedure (i.e., asking a participant to go as deeply as possible into hypnosis without any other overt suggestions or instructions) and published a report about the phenomenology of a hypnotic "virtuoso." He described the participant's progression into self-assessed deep hypnosis without any specific suggestions along various dimensions: 1) his body became very relaxed until awareness of the body was lost, 2) awareness of breathing gradually disappeared, 3) absolute blackness was perceived, 4) sense of identity and ego-awareness waned and gave rise to a sense of potentiality, 5) time slowed down until it became meaningless, 6) spontaneous mental activity was lost, and 7) a feeling of oneness with the universe ensued.

Tart's case study was subsequently replicated in within-subject designs. Sherman (1971) found statistically significant clusters of phenomena related to deep hypnosis. The deepest level of hypnosis included difficulties in talking, feeling oneness with everything, loss of individual identity, episodes of absolute mental quiet and voidness, feeling in a different level of reality, and great brightness. The very deep hypnotic state was also correlated with occurrences of reductions in EEG amplitude. A medium level of hypnosis was characterized by pleasant emotional experiences, simple images, and body sensation (e.g., relaxation, wavelike experiences, motion). Ideas, worries, and "normal verbal thinking" were reported during light hypnosis.

Feldman (1976) obtained a similar pattern of results as Sherman (at the beginning of hypnosis mainly changes in body image and bodily sensations; in deeper hypnosis, phenomena such as feeling one with the surroundings, being immersed in blackness, a sense of awe and wonder). He also found that participants' expectations were negligible predictors of deep hypnotic phenomena. Ernest Hilgard (1986) carried out some informal research and stated that deeply hypnotized individuals spontaneously reported losing contact with their body, an altered sense of time and mystical phenomena such as a sense of oneness and ineffability.

Despite the consistency of the findings on the phenomenology of deep hypnosis, they have had various methodological shortcomings, including: a) no control for relaxation effects (all studies reviewed), b) no quantitative analysis published and reliance on case studies (Erickson, Hilgard, and Tart), c) no comparison conditions (Sherman, Tart; Feldman used a baseline condition as "control"), and d) lack of a previously validated instrument to evaluate alterations in consciousness (except for Feldman, who administered the rarely-used Linton-Langs questionnaire).

To reduce or eliminate some of these shortcomings and investigate the effect of physical activity on phenomenal experience, I carried out a study (Cardeña, 2005) using a "neutral" hypnosis procedure (i.e., no specific suggestions other than asking the person to go into a very deep, and undefined, state of hypnosis) with highly hypnotizable participants.

Sample. Out of an initial sample of about 150 undergraduates, 12 individuals were selected (mean age = 20.42, SD=2.54, all of them European-American, 8 women). The criteria for selection included scoring very highly on standardized hypnotizability scales and not manifesting overt pathology, as measured by the Minnesota Multiphasic Personality Inventory (MMPI). As can be seen in Tables 1a-b, this group had very high scores in hypnotizability and the related construct of absorption. Furthermore, as evaluated by the Myers-Briggs Inventory, 10 out of the 12 participants tended to have a global, intuitive type of perception, consistent with proposals that hypnotic virtuosos tend to be imaginative and creative (Hilgard, J., 1979), and that hypnosis involves a holistic type of thought (Crawford, 1981).

TABLE 1A:
DEMOGRAPHIC AND PERSONALITY VARIABLES

Participant	Age	Sex	Major	Personality type	Ego-strength
#1	18	M	Physics	INTP	50
#2	23	M	Psych/Stat	ENFJ	51
#3	20	M	Undeclared	ISFJ	41
#4	20	M	Physics	ENTP	46
#5	27	F	Linguistics	INTJ	54
#6	18	F	Zool/Psych	ENFP	49
#7	19	F	Biochemistry	ENFP	45
#8	20	F	English	INFP	47
#9	21	F	English	INFP	50
#10	21	F	Psychology	ENFP	49
#11	18	F	Psychology	ENTP	50
#12	20	F	Biochemistry	ESTJ	31
Means	20.42				46.92

* According to the Myers-Briggs Inventory, where E=extraverted, I=introverted, S=sensing, N=intuition, T=thinking, F=feeling, J=judging, P=perceptive. The result of 10 out of 12 participants having an intuitive style of perception would be statistically significant assuming a binomial probability of 50% or even 55% for the distribution of "Ns" among this sample (p=.0193 for 50% probability, p=.0421 for 55% probability, one tailed test)

** Barron's Ego-Strength Scale of the MMPI

TABLE 1B:
HYPNOTIZABILITY AND RELATED VARIABLES

	HGSHS:A	IS	SHSS:C	SPS:1	SPS:2	DPQ	PAS
Group means	10.58	26.75	10.58	19.5	21.08	25.5	8.08

HGSHS:A= Harvard Group Scale of Hypnotic Susceptibility, Form A, score range = 0-12.
IS= Field's Inventory Scale of Hypnotic Depth, score range = 0-38.
SHSS:C= Stanford Hypnotic Susceptibility Scale, Form C, score range = 0-12.
SPS:1= Stanford Profile Scale of Hypnotic Susceptibility, Form 1-Revised, score range = 0-27.
SPS:2= Stanford Profile Scale of Hypnotic Susceptibility, Form2-Revised, score range = 0-27.
DPQ= Absorption Scale of the Differential Personality Questionnaire, score range = 0-34.
PAS= Perceptual Alterations Scale of the MMPI, score range = 0-25.

Design

This study was repeated-measures factorial, with 2 (hypnosis versus no hypnosis) x 3 factors (types of physical stimulation: motionless on a bed or "quiescent," "pedaling" a stationary bicycle at a comfortable rate, and having a "motor" do the pedaling at a comfortable rate). This paper focuses only on hypnotic phenomenology during deep states; further details about the statistical analyses and the effect of physical activity can be found elsewhere (Cardeña, 2005).

Procedure

After participant selection, three hypnosis training sessions were conducted to familiarize participants with the laboratory and physical conditions, and let them practice going in and coming out of hypnosis by themselves. They also practiced a numerical self-report scale of hypnotic depth (0=wide awake… 41= very deep hypnosis), which previous research has shown to be a valid indicator of changes in subjective experience (Laurence & Nadon, 1986). The experiment took place in a silent and dimly lighted room. In the three hypnosis sessions physical conditions were administered in counterbalanced order, with a 1-30 induction count; the only suggestion was that as the count progressed participants would go into an increasingly deeper level of hypnosis, until they "came out" of hypnosis by themselves. At the end of the induction and at 5 minute intervals the experimenter repeated the word "state," to elicit a numerical depth report, and asked "what are you experiencing?" Participants were free to report their experience at any other point if they so desired. The length of the hypnosis sessions was not predetermined. After the hypnosis session, control sessions were conducted with a 1-30 count, but without the suggestion to go into deep hypnosis. The sessions were recorded and later transcribed.

After every session participants were interviewed about their experience and completed the Phenomenology of Consciousness Inventory (PCI; Pekala, 1991) for their "deepest state," and a comprehensive checklist of psychological phenomena for each level of hypnosis (including no hypnosis). This paper reports the comparison between the hypnosis and control conditions, as measured by the dependent variables of the PCI, and descriptions of different levels of hypnosis as evaluated by depth reports, in-session verbalizations, and phenomena significantly more frequently endorsed for each level, as measured by chi squares.

Results

As Table 2 shows, during very deep hypnosis participants mentioned alterations in body image, time sense, perception and meaning, and the sense of being in an altered state of awareness. They also reported increases in affect, attentional focus, and amount and vividness of imagery, but less self- awareness, rationality, voluntary control, and memory. Variables that seem irrelevant to hypnosis such as "sexual excitement" showed no differences between conditions.

TABLE 2:
MEAN SCORES AND SDS IN THE PHENOMENOLOGY OF CONSCIOUSNESS INVENTORY*

Dimension	Hypnosis	Control	F (df = 1,10)	d
Altered Experience	3.70 (.86)	0.61 (.99)	56.0***	3.49
Body image	3.89 (1.10)	0.95 (1.36)	29.9 ***	2.49
Time sense	4.13 (1.45)	0.59 (1.25)	57.5 ***	2.74
Perception	4.06 (1.52)	0.51 (.89)	70.0 ***	2.99
Meaning	3.07 (1.52)	0.46 (.97)	25.5 ***	2.15
Positive Affect	2.27 (1.06)	1.18 (1.44)	9.8 *	0.9
Joy	3.39 (1.56)	1.47 (1.83)	10.8**	1.18
Sexual Excitement	0.8 (1.03)	0.91 (1.92)	0.0	-0.07
Love	2.62 (1.63)	1.17 (1.52)	14.0 **	0.96
Negative Affect	1.1 (1.02)	0.29 (.53)	20.6 **	1.05
Anger	0.79 (1.32)	0.29 (.70)	4.1	0.5
Sadness	1.29 (1.30)	0.27 (.59)	10.5 **	1.06
Fear	1.29 (1.43)	0.31 (.67)	24.7 **	0.92
Attention	4.68 (.81)	3.83 (1.28)	3.5	0.83
Direction	4.76 (.79)	3.47 (1.60)	7.0 *	1.07
Absorption	4.57 (1.36)	4.36 (1.42)	0.1	0.16
Visual Imagery	4.87 (1.06)	2.26 (1.64)	29.98 ***	1.98
Amount	5.33 (.83)	2.03 (1.53)	80.89 ***	2.81
Vividness	4.5 (1.50)	2.47 (1.93)	15.95 **	1.23
Self Awareness	2.87(1.06)	4.83 (1.20)	24.18 ***	-1.82
A.S. of Awareness	4.97 (.94)	1.05 (1.22)	50.47 ***	3.78
Arousal	1.53 (1.40)	1.52 (1.41)	0.0	0.01
Rationality	3.76 (1.42)	5.04 (1.24)	9.1 **	1.01
Voluntary control	1.83 (1.08)	3.89 (1.66)	16.8 **	-1.54
Memory	4.81 (.89)	5.42 (.71)	19.3 ***	-0.79
Internal Dialogue	2.62 (1.77)	3.46 (2.05)	1.3	-0.46

***= p<.001; **= p .01; *= p<.05

Reprinted with kind permission from "The Phenomenology of Deep Hypnosis: Quiescent and Physically Active," by Etzel Cardeña, 2005, *International Journal of Clinical and Experimental Hypnosis,* p. 47.

The experience sampling during the sessions and the checklist provide specific information on the content of these alterations and are arranged by the level of hypnosis in which they were typically reported. At the level of no hypnosis and feeling slightly different than normal, participants did not report any change other than some relaxation. The next level, light/medium hypnosis, was typically mentioned at the beginning of the hypnosis sessions and involved body sensations and, less frequently, changes in body image. Relaxation increased, especially in the quiescent condition (e.g., participant #11: "Slowly relaxed. I can't really feel my body"), along with tingling (e.g., P #12: "Darkness, tingling sensations"), "feeling light," and "spinning." There were also changes in body image (e.g., P#2: “My hands have been growing, they are like big rocks”) and an increasing sense of well-being (e.g., P #1: "Feeling mellow, both physical and emotional"). Respondents also mentioned increased concentration on their inner experience and losing touch with the external environment.

Most anomalous phenomena were related to deep and very deep hypnosis. The sensation of "lightness" became more pronounced, such as the body floating, flying, leaving the physical body, and so on (e.g., P #9: "It's just sort of me floating," P #2 "I don't have a physical body anymore"). There were also, paradoxically, frequent reports of the body falling down (e.g., P#3: "sinking deep, deep"), sometimes into a dark liquid. In any case, at this level if there was an experience of a body it was of a phenomenal, not physical, body. Somatic sensations were often incorporated into ongoing, imaginal events (e.g., P #8: “walking down in a spiral staircase”).

Overall there was a change of modality from concepts to spontaneous imagery, often including geometric designs such as prisms, grids and tunnels (e.g., P #10: “(Pictures) like nothing else in this world: geometric”), which became more elaborate and vivid, sometimes in a cross-modal or synesthetic way (e.g., P #4: “lines of different colors that stretch infinitely… making music that I have never heard before”). There were also common reports of “having no thoughts” (e.g., P #9: "For a while I was just total nothing"). Various categories referring to imagery were endorsed at this level: “increased quality,” “sustained sequences,” spontaneous imagery,” “greater realness,” and “imagery not referable to a sensory modality,” sometimes interpreted as similar to “dreaming” (although no one was observed to have fallen asleep). There were ubiquitous reports of both “flashes of light” and “brightness” (e.g., P #5: "Colors with lots of light and energy"), and also, paradoxically, “great obscurity” (e.g., P #3: "Complete black, no sense of clearness").

Emotions were generally very positive (e.g., P #4: "All the feelings that are good just surround me"), although a few respondents also mentioned some fear about the unusualness of the experiences encountered. With respect to cognition, participants mentioned “difficulties remembering” everyday activities but “suddenly remembering” forgotten events, along with “greater control” over their mental states while maintaining “free floating” attention. Many transpersonal/spiritual experiences were reported including a sense of timelessness, “being one with everything,” “greater relatedness,” “loss of identity,” but being “in touch with one’s inner self" (e.g., P #5: "I'm not matter anymore… just energy"). There was as well a sense of “being in a different reality” that entailed “profound personal insight,” “increased sense of potentiality,” and “increased meaningfulness.”

A general sequence of hypnosis experience (see Table 3) is that at the beginning, participants just felt more relaxed. Light/medium hypnosis was mostly characterized by alterations in body sensations and body image, which later became experiences of floating/flying (and sometime sinking), and an increasing disconnection from the body and the environment. As hypnosis became "deeper," there was a shift from conceptual thinking to spontaneous imagery, which became dreamlike (and experienced as very real) or gave rise to timeless experiences of pure light and love, no thoughts and cognitive emptiness, and an overall sense of euphoria, potentiality, meaningfulness, insight, and connectedness with all.

TABLE 3:
CHARACTERISTIC PHENOMENA ACCORDING TO HYPNOTIC DEPTH

	No	Light /Medium	Deep/very deep
Body sensation	Same	Deep relaxation, spinning, etc.	Disembodiedness
Emotion	Same	Mildly positive	None or more intense (e.g., "awe, wonder")
Attention	Same	Focused on body changes	Free-floating
Memory	Same	Same	Infrequent retrieval of forgotten material
Thought	Same	Decrease of "mental chatter"	Totally absorbed in event, or absent
Imagery	Poor	Simple (e.g. geometric forms) light, blackness	Complex imagery
Time sense	Normal	Slow	Timelessness
State of Consciousness (SOC)	Same	Trance	Akin to lucid dream; or transcendent SOC
Transpersonal experiences	None	Well-being	Merging, becoming one with all; "void"

In interviews at the end of the experiments and 8 months later there was no mention of any negative effects, but of various positive sequelae (e.g., greater perceptual vividness and dream recall, increased personal insight and inner peace, decrease in anxiety and nightmares). This suggests that, in addition to its research potential, deep hypnotic experiences may be of great benefit in therapeutic and self-growth contexts.

CONCLUSIONS

With respect to a possible connection between mesmerism/hypnosis and psi phenomena, earlier reports of enhanced psi abilities would not, in general, stand up to current evidential requirements, however a few observations with exceptional participants are suggestive of actual psi. More recent meta-analytic studies make a stronger case for a connection between a hypnotic context and psi performance, although two important hypotheses require further testing. The first one would evaluate to what extent the apparent increase in psi performance is due to a general mechanism (e.g., decrease in exteroceptive stimulation and greater focus on “internal” stimuli; Honorton, 1977), or to a specific interaction between a trait (high hypnotizability) and a state (the hypnotic context), considering the evidence that highly hypnotizables tend to experience anomalous experiences. The second hypothesis would test whether an experimenter effect, and not hypnosis, may explain previous significant findings. In any event, the meta-analyses are based on mostly older data that require replication with more sophisticated methodology.

The patterns of spontaneous anomalous experiences by high hypnotizables in a hypnotic context are remarkably consistent and also resemble descriptions of various anomalous experiences. For instance, deep hypnosis reports included a sense of the reality of connectedness with everything (the landmark of a mystical experience; Wulff, 2000); a bright light and a sense of pervading well-being (as in near-death experiences; Greyson, 2000); a sense of floating out of the body (as in OBEs; Alvarado, 2000); geometric constants that, in some cases, became part of more elaborate imaginal events (as in experiences with psychedelics; Siegel, 1977); and even specific shamanic phenomena such as seeing one’s body as a skeleton (Cardeña, 1987).

These results are unlikely to be attributable to religious beliefs (the context was secular and participants seemed to be truly surprised at what they were experiencing), expectations (that, when measured, have not seemed to account for most phenomena; Cardeña, 2005; Feldman, 1976), to experimenter effects or demand characteristics (which were intentionally minimized), nor to such events as use of psychoactive drugs or life-threatening circumstances. Rather, they seem to manifest basic aspects of mental states, at least among a highly select group. The results support the notion that anomalous experiences (and their likely neurological underpinnings, see Newberg & D’Aquilli, 2000) may give rise to mystical beliefs (the "Perennial Philosophy" of Huxley, 1946), rather than the converse (Katz, 1983).

Also, the results of the projects reviewed strongly suggest that different modalities of experience are consistently manifested according to self-assessed levels of hypnotic depth. The similarity of reports amongst different participants and with those from other contexts evidence identifiable states of consciousness. The studies reviewed also belie the concept of a single "hypnotic state." The participants' reports and an inspection of the cluster of phenomena according to depth level suggests that different levels of hypnosis (e.g., light vs. very deep) are better conceptualized as discreetly distinct modes of experiencing (Tart, 1975) than as variations in intensity (Singer, 1977). The non-linearity of certain phenomena (e.g. emotional intensity) and the emergence of occurrences (e.g. "merging with a light") only at a very deep level support this contention. A model of levels of hypnotic experience is consistent with different phenomena mediated by increasing absorption as mentioned in the classical meditation literature (Holroyd, 2003). For instance, experiences during “deep states” of meditation (e.g., “there was no sense of my physical body… no thought,” “you’ve fallen into a hole that’s so deep,” “utterly serene;” Gifford-May & Thompson, 1994) are interchangeable with those derived from deep hypnosis. It also bears mentioning that a study with meditators found significant changes in meaning, time sense, love, and state of awareness (Venkatesh, Raju, Shivani, Tompkins, & Meti, 1997). Thus, the phenomena reported in the study are not exclusive to a hypnosis context but are consistent with other findings that hypnotic virtuosos have a propensity to report various anomalous experiences (Pekala & Cardeña, 2000).

Which brings us to the philosophical question of the nature of deep hypnotic experience. While avoiding the pitfalls of positing a somewhat pejorative "regression" terminology, some authors maintain that a form of cognition similar to that expressed during deep hypnosis may be common during infancy, and could underlie ordinary consciousness (e.g., Hunt, 1985). Some of the imagery (e.g., falling through a tunnel, finding viscous substances) are consistent with the notion of neurological (Newberg & D'Aquilli, 2000) and psychological (Groff, 1985) predispositions and deserve further investigation. In any case, research in this area seems unlikely to be explained in terms of "faulty brains" (cf. Rose, 1988), but suggests a basic aspect of consciousness that may be life-changing and have evolutionary implications (McClennon, 2001).

References

Aaronson, B. S. (1967). Mystic and schizophreniform states and the experience of depth. *Journal for the Scientific Study of Religion, 6,* 246-252.

Alvarado, C. S. (2000). Out-of-body experiences. In E. Cardeña, S. J. Lynn, & S. Krippner (Eds.), *The varieties of anomalous experience* (pp. 183-218). Washington, DC: American Psychological Association.

Ås, A., & Ostvold, S. (1968). Hypnosis as subjective experience. *Scandinavian Journal of Psychology, 9,* 33-38.

Cardeña, E. (1987). Deep hypnosis and shamanism. Convergences and divergences. In R. I. Heinze (Ed.) *Proceedings of the Fourth International Conference on Shamanism and Alternate Forms of Healing.* California: Southeast Asia Scholars.

Cardeña, E. (2005). The phenomenology of deep hypnosis: Quiescent and physically active. *International Journal of Clinical & Experimental Hypnosis, 53,* 37-59.

Cardeña, E., Alarcón, A., Capafons, A., & Bayot, A. (1998). Effects on suggestibility of a new method of active-alert hypnosis. *International Journal of Clinical and Experimental Hypnosis, 3,* 280-294.

Cardeña, E., Lynn, S. J., & Krippner, S. (Eds.). (2000). *Varieties of anomalous experience: Examining the scientific evidence*. Washington, DC: American Psychological Association.

Cardeña, E., & Spiegel, D. (1991). Suggestibility, absorption, and dissociation: An integrative model of hypnosis. In John F. Schumaker (Ed.) *Human suggestibility: Advances in theory, research and application* (pp. 93-107). New York: Routledge.

Crabtree, A. (1988). *Animal magnetism, early hypnotism, and psychical research 1766-1925. An annotated bibliography.* New York: Kraus International Publications.

Crawford, H. J. (1981). Hypnotic susceptibility as related to gestalt closure. *Journal of Personality and Social Psychology, 40,* 376-383.

Dingwall, E. J. (Ed.) (1967-8). *Abnormal hypnotic phenomena: A survey of nineteenth-century cases,* 4 Vols. London: J, & A. Churchill.

Ellenberger, H. F. (1970). *The discovery of the unconscious.* New York: Basic Books.

Erickson, M. H. (1952). Deep hypnosis and its induction. In L. M. LeCron (Ed.), *Experimental Hypnosis (*pp. 70-114). New York: Macmillan.

Erickson, M. H. (1965). A special inquiry with Aldous Huxley into the nature and character of various altered states of consciousness. *American Journal of Clinical Hypnosis, 8,* 17-33.

Evans, Frederick J. *The structure of hypnosis: A factor analytic investigation.* Unpublished doctoral dissertation. University of Sidney, Australia, 1963.

Feldman, B. E. (1976). *A phenomenological and clinical inquiry into deep hypnosis.* Unpublished doctoral dissertation, University of California, Berkeley, CA.

Field, P. B. (1965). An inventory scale of hypnotic depth. *International Journal of Clinical and Experimental Hypnosis, 13,* 238-249.

Fromm, E., Brown, D. P., Hurt, S. W., Oberlander, J. Z., Boxer, A. M., & Pfeifer, G. (1981). The phenomena and characteristics of self-hypnosis. *International Journal of Clinical and Experimental Hypnosis, 29,* 189-246.

Gauld, A. (1992). *A history of hypnotism.* Cambridge, UK: Cambridge University Press.

Gifford-May D., & Thompson N. L. (1994). "Deep states" of meditation: Phenomenological reports of experience. *Journal of Transpersonal Psychology, 26,* 117-138.

Gill, M., & Brenman, M. (1959). *Hypnosis and related states.* New York: International Universities Press.

Greyson, B. (2000). Near-death experiences. In E. Cardeña, S. J. Lynn., & S. Krippner (Eds.), *The varieties of anomalous experience* (pp. 315-352). Washington, DC: American Psychological Association.

Grof, S. (1985). *Beyond the brain. Birth, death and transcendence in psychotherapy.* New York: State University of New York.

Hilgard, E. R. (1968). *The experience of hypnosis.* New York: Harcourt, Brace & World.

Hilgard, E. R. (1986). *Divided consciousness*. (Expanded edition). New York: Wiley.

Hilgard, J. R. (1979). *Personality and hypnosis. A study of imaginative involvement.* (Second Edition). Chicago: University of Chicago Press.

Holroyd, J. (2003). The science of meditation and the state of hypnosis. *American Journal of Clinical Hypnosis, 46,* 109-128.

Honorton, C. (1977). Psi and internal attention states. In B. B. Wolman (Ed.) *Handbook of parapsychology* (pp. 435-472). New York: Van Nostrand Reinhold.

Hunt, H. T. (1985). Relations between the phenomena of religious mysticism (altered states of consciousness) and the psychology of thought: A cognitive psychology of states of consciousness and the necessity of subjective states for cognitive theory. *Perceptual and Motor Skills, 61,* 911-961.

Huxley, A. (1946). *The perennial philosophy*. London: Chatto & Windus.

Katz, S. T. (Ed.). (1983). *Mysticism and religious traditions.* New York: Oxford University Press.

Laurence, J. R., & Perry. C. (1988). *Hypnosis, will and memory.* New York: Guilford.

Laurence, J. R., & Nadon, R. (1986). Reports of hypnotic depth: Are they more than mere words? *International Journal of Clinical and Experimental Hypnosis, 34,* 215-233.

Ludwig, A. M. Alterations in consciousness produced by hypnosis. *Journal of Nervous and Mental Disease,* 1965, 140(2), 146-153.

McClennon, J. (2001). *Wondrous healing. Shamanism, human evolution, and the origin of religion.* DeKalb, IL: University of Northern Illinois Press.

Newberg, A. B. & d'Aguili, E. G. (2000). The neuropsychology of religious and spiritual experience, *Journal of Consciousness Studies, 11-12*, 251-266.

Orne, M. T. (1959). The nature of hypnosis: Artifact and essence. *Journal of Abnormal and Social Psychology, 58,* 277-299.

Palmer, J. (1987). Have we established psi? Journal of the American Society for Psychical Research, 81, 111-123.Pekala, R. J. (1991). *Quantifying consciousness: An empirical approach.* New York: Plenum.

Pekala, R., & Cardeña, E. (2000). Methodological issues in the study of altered states of consciousness and anomalous experiences. In E. Cardeña, S. J. Lynn, & S. Krippner (Eds.), *The varieties of anomalous experience* (pp. 47-81). Washington, DC: American Psychological Association.

Rose, S. P. (1988). *The conscious brain*. (Revised edition), New York; Paragon.

Sacerdote, P. (1977). Applications of hypnotically induced mystical states to the treatment of physical and emotional pain. *International Journal of Clinical and Experimental Hypnosis, 25,* 309-324.

Schechter, E. I. (1984). Hypnotic induction vs. control conditions: Illustrating an approach to the evaluation of replicability in parapsychological data. *Journal of the American Society for Psychical Research, 78,* 1-27.

Sherman, S. E. (1971). *Very deep hypnosis: An experiential and electro- encephalographic investigation.* Unpublished doctoral dissertation. Stanford University, California..

Siegel, R. K. (1977). Hallucinations. *Scientific American, 237,* 137-140.

Singer, J. L. (1977). Ongoing thought: The normative baseline of altered states of consciousness. In N. E. Zinberg (Ed.) *Alternate states of consciousness.* New York: Free University Press.

Stanford, R. G. (1992). Experimental hypnosis-ESP literature: A review from the hypothesis-testing perspective. *Journal of Parapsychology, 56,* 39-56.

Tart, C. T. (1970) Transpersonal potentialities of deep hypnosis. *Journal of Transpersonal Psychology, 2,* 27-40.

Tart, C. T. (1975). *States of consciousness.* New York: Dutton.

Venkatesh, S., Raju, T. R., Shivani, Y., Tompkins, G., & Meti, B. L. (1997). A study of structure of phenomenology of consciousness in meditative and non-meditative states. *Indian Journal of Physiological Pharmacology, 41,* 149-153.

Weitzenhoffer, A. M. (2000). *The practice of hypnotism.* Second edition. New York: Wiley.

Wulff, D. M. (2000). Mystical experience. In E. Cardeña, S. J. Lynn, & S. Krippner (Eds.), *The varieties of anomalous experience* (pp. 397-440). Washington, DC: American Psychological Association

RELATIONS BETWEEN ESP AND MEMORY IN LIGHT OF THE *FIRST SIGHT* MODEL OF PSI

James C. Carpenter, Ph.D.
Rhine Research Center
Durham, NC, USA

ABSTRACT

Although less active recently, the study of ESP in relation to memory has been a relatively active concern for parapsychology. Methods, questions and findings have been varied, and in need of clearer conceptualization for work to proceed usefully. The *First Sight* model of psi functioning is proposed as having promise in this regard. I sketch the basic premises of the model (by which psi transactions are presumed to begin the developmental processes of all experience), and argue here that various findings, including the positive correlation of long-term memory with ESP, the negative correlation of working memory with ESP, the importance of alerting participants to the pertinence of ESP in the context of memory tests, the additive and subtractive effects of attempts to influence recall with ESP, and the effect of degree of familiarity of test material on ESP, among other trends, are congruent with the expectations arising from the model.

INTRODUCTION

During a roughly 20-year period beginning in 1967, the problem of the relation between memory and ESP was a relatively active research topic for our small field, with over 40 studies accumulating. There were many different operations used for both memory and ESP, and several different kinds of questions were asked. The work developed idiosyncratically within parapsychology, and unfortunately made little reference to the burgeoning field of memory research in mainstream cognitive psychology. The various results reported appeared contradictory, at least if viewed superficially, and this, along with the loss of interest in forced-choice ESP test methods (upon which the studies mostly relied) may have led to a decline of activity in this area. The current paper reviews this collection of reports in light of the *First Sight* model of psi functioning (Carpenter, 2004, 2005b).

BACKGROUND

Psi/Memory Theory and Phenomenology

Theories of psi proposed by Roll (1966) and Irwin (1979) have emphasized the importance of memory traces as vehicles for psi expression. Roll's ideas were influenced by H. H. Price (1949/1967) who stressed that memory traces are essential for all experience, including psychic. By this concept, ESP has no medium of its own for carrying information. A psychic stimulus evokes a memory trace, and this bit of memory is what carries the psychic information to consciousness. An implication of this idea is that the more strongly an item is placed within the associative network, the more likely it can carry ESP information.

This paper explores the relation between ESP and memory by reviewing most of the experimental literature on the topic, and by offering some possible syntheses of that literature in terms of the *First Sight* model of psi.

Sketch of the First Sight Model

The basic premise of this model is that all experience begins at the psi level of functioning; thus psi is *first sight*. Just as every perception is known to have a process of development that is largely preconscious (Gollwitzer, 1990, Solley & Murphy, 1960), all other modes of experience are assumed to develop similarly. The chain of preconscious development is assumed to begin with the psi level of engagement with the extended world. This model further assumes that all organisms are preconsciously engaged with reality beyond their physical, sensory boundaries. All such distal engagements are termed "psi." These engagements are preconscious and anticipatory. They are the leading edge of the preconscious processes by which the mind assembles all its experience.

Like other preconscious processes, psi is assumed to be personal and purposeful, not mechanical and impersonally automatic. Even though unconscious, it is more aptly viewed as part of what an organism *does* than as something that merely happens to it.

It is assumed that the psi level of engagement is constantly active. We use it to help efficiently anticipate and understand our developing experience. By it we also are helped to avoid undesirable circumstances and find desirable ones. Psi is not a degraded or disguised form of consciousness. It is an aspect of the preconscious process that leads to consciousness.

Generally, psi apprehensions are invisible to consciousness. However, like subliminal apprehensions, they arouse nexi of meaning and feeling that anticipate developing experience. If the process of the development of an experience is interrupted (as by showing a stimulus too briefly to be perceived, or keeping a potential experience locked away in another room) then these activated networks can be seen to be inadvertently expressed in fantasies, associations, spontaneous behaviors, moods, dreams, etc. Such material may be seen as alluding to the potential meaning apprehended extrasensorily (or sometimes alluding away from it). Some states of mind are better for expressing and noticing these inadvertent expressions than others.

The model assumes that the mind democratically and unconsciously draws upon all available sources of information in arriving at an orientation to developing experience. That is, psi experiences are expected to be drawn upon, along with memories, subliminal stimuli, and elements of imagination in contributing to the formation of the ongoing flow of experience.

Psi is assumed to be bimodal. In regard to any potential experience, one's stance either may be toward the thing or away from it (a posture of approach or avoidance). A stance toward the thing will lead it to contribute additively to experience. A stance away-from will lead to a subtractive contribution to experience (the potential meaning will be decisively avoided in the forming experience). The terms *assimilation* and *contrast*, drawn from general psychology, are useful in this context. Another term for additive participation of an element is *assimilation.* Subtractive participation is termed *contrast.* Assimilation and contrast are well studied in the formation of judgements (e.g. DeCoster & Claypool, 2004), and in the gestalt study of percepts (e.g. Kohler, 1947). Events outside the focal boundary of an experience may be thought of as parts of its *context*. The model assumes that patterns of assimilation and contrast should often apply similarly whether the elements of context are subliminal, remembered or extrasensory. It is known that elements of context sensed to be more similar to the experience that is forming, or to the intentions guiding it, are more likely to be assimilated (Schwartz and Bless, 1992). On the contrary, elements sensed to be dissimilar, are dis-assimilated (or rendered into contrast and excluded). The more well-defined an experience is, the more likely it is that contextual elements will not be assimilated. This is because a more precise and highly defined experience implies a stricter criterion for "similar enough," leading to the exclusion of more potential elements. Conversely, a vaguely-defined experience will evoke looser criteria, and be less exclusive, leading to more liberal assimilation. In an ESP experiment, assimilation will be expressed as psi-hitting scores, and contrast as psi-missing scores. A state of mind that is unfocused and receptive is more amenable to the assimilative expression of extrasensory apprehensions. States that are highly focused and characterised by clear, cognitive work will make it likely that such apprehensions will be subject to contrast and excluded from expression. If this latter situation involves an ESP test, the contrast will express as psi missing.

At least in regard to extrasensory apprehensions, in terms of any potential experience these two modes tend to switch at some rate. They may be relatively stable, or they may switch rapidly. The more slowly they switch, the more behavior is likely to express some reference to the potential experience that is psi-apprehended (the reference may be additive or subtractive). Conversely, rapid switching will make it very unlikely that any discernable reference will be made to the experience. In an ESP test, this rate of switching will effect the size of scoring deviations. If switching is slow or stable, the deviations will be large. If switching is rapid, the deviations will be small. If some extrasensory apprehension continues to seem relevant to forming experience, switching will be slow and either an assimilative or dis-assimilative expression of the apprehension may be discerned. Potential meanings that are important in terms of a person's central concerns are likely to evoke slow switching and, in an ESP test, extreme scoring. If an apprehension seen as irrelevant continues to seem irrelevant, switching is expected to become rapid, and no expression of it will be permitted. This potential meaning will be "bound“ outside of expression and awareness. The model assumes that most such potential meanings are "bound“ in this manner at each moment.

Similar Function of Memory and Psi in the First Sight Model

This model hypothesizes that ESP mingles with other preconscious processes in shaping experience. Psi is not assumed to function uniquely in the human psyche, like an unpredictable "wildcard“ with magical properties. To the contrary, the model assumes that both memory and ESP (and other preconscious functions) all work together smoothly and continuously, and should show many similar patterns of functioning. It also assumes that remembered material and extrasensory material should be drawn upon conjointly in anticipating and shaping experience, although their mutual influence may sometimes be additive and sometimes subtractive as a functon of different conditions..

The questions that have been studied in past reports will be grouped in 3 general categories.

1. Are ESP and memory similar processes? If so they should be positively correlated when tested in the same or similar situations, and should follow similar internal patterns of functioning.
2. Can ESP “stimuli“ influence memory retrieval? Testing this involves adding some element of ESP to a memory task.
3. Does remembered information influence the attempt to retrieve ESP information? Testing this involves adding some variable of memory to an ESP task.

ARE ESP AND MEMORY SIMILAR PROCESSES?

If memory and extrasensory perception are similar processes, then they should be positively correlated within the performance of given participants tested in similar situations. They should also show similar patterns of functioning in terms of other variables.

Are ESP and Memory Correlated Capacities?

The first report on this question described 3 series that attempted to confirm a serendipitous observation of a positive correlation between participants' scores on memory and ESP tests. Feather was carrying out a pilot study in which she was intending to arouse some frustration in her participants by asking them to carry out a memory test prior to their ESP test, thinking that the frustration might lower their scores. ESP scores were not lowered, but she noticed that they were positively correlated with scores on the memory test, and then planned her series to see if the relationship was replicab le. The effect was significantly confirmed (Feather, 1967). Attempts at replication by other investigators gave mixed results. Two studies produced significantly positive confirmations (Kanthamani & Rao, 1974; Rao, 1978), and 2 yielded significant negative relationships (Parker, 1976; Rao, Morrison & Davis, 1977). Several other studies yielded non-significant trends in both directions. A review at the time (Palmer, 1978) noted that this mixed-picture was provocative and seemed potentially important, but the researchers themselves had offered little conceptual clarity.

Some clarification of the mixed findings that had accumulated by the late 1970's was suggested in a subsequent review by H. J. Irwin (1979), who noted that researchers had not made reference to the important distinction between primary (or short-term) and secondary (long-term) memory. Primary memory (now generally referred to as *working memory)* is a relatively conscious, effortful matter in which one is actively holding some item in mind through rehearsal and then attempting to reproduce it. Long-term memory is a less consciously effortful process of calling up or otherwise responding to some item of information previously learned. One important operational difference in assessing the two types is the use of some interpolated task between memorization and recall in tests of long-term memory, while tests of working memory are given immediately after learning without an interpolated distraction. When the studies that had been reported were broken down in terms of this distinction, tests of long-term memory (like Feather's original studies) tended to confirm the positive correlation, while tests of working memory tended to show negative relationships. Some other studies used designs that Irwin thought gave room for participants to rely on either memory strategy, depending upon their personal proclivities; these studies tended to give mixed or null relationships. While Irwin was not sure at the time how best to interpret this pattern of results, we may say in retrospect that they are consistent with the expectations that would be drawn from the *First Sight* model.

Expectations of First Sight Model

The model assumes that psi apprehensions are available for positive influence of inadvertent pre-conscious processes, and hence for possible inclusion into the formation of experience, if the unconscious posture toward the event is predominantly "toward" and if any switching of directional tendency is relatively slow. A "toward" posture requires that the content of the apprehension seems pertinent to the person's needs and interests in the moment and seems relatively congruent with the primary nature of the experience as it is developing. A slow rate of switching requires that this sense of positive pertinence is relatively unitary or stable. An open, "free-floating", relatively undefined state of mind facilitates these conditions, whereas cognitive work on clear, conscious content inhibits them (the better defined an experience is, the less likely it is that elements of context will be sensed as pertinent and assimilated). Assimilation of psi-based material is highly similar then, to the activity of retrieving or responding to elements from long-term memory; whereas the consciously effortful process of retaining and reproducing working memory should act to exclude the extrasensory.[1]

We may distinguish among 4 different situations, and state the model's expectations in regard to each.

- In *working (primary or short-term) memory*, active cognitive effort is required for successful recall of material. Hence, anyone carrying out successfully a task primarily involving working memory should be excluding extraneous implicit contextual elements (including extrasensory) at the same time. However, if someone is doing poorly at such a task they are presumably being less successful or employing less concentration, and they might be expected to be more amenable to extraneous influence in their responses. Hence a negative relation is expected between these two tasks in a given situation.
- In *long-term (secondary) memory*, reproduction or recognition of material previously learned requires a more passive inner searching of experience, associations, images, etc. In the context of an ill-defined ultimate experience, this posture facilitates a broadly inclusive sampling of contextual elements, making assimilation of potentially pertinent material (from whatever source) more likely. Someone carrying it out successfully must be rather passively and openly searching a broad range of inner associations, images, and sensations, looking for some sense of fit, and this is the same sort of posture most likely to facilitate the expression of extrasensory apprehensions. Hence, in a given situation, the two tasks should be positively correlated.

[1] A great deal has been learned in recent decades about the neurological substrate of memory (for overviews see Schacter 1996 and Posner, Petersen & Fox, 2002). All of this knowledge suggests a host of interesting questions about psi and memory that could be raised from that level of observation. However, for the sake of conciseness, only the psychological aspects of memory and psi are examined in this paper.

- However, if some information is very securely learned, other considerations enter in. In the extreme case, highly rehearsed memorization is called *over-learned.* An example is one's own name. In this case, the item to be recalled is so well learned that any cue toward it calls the information up immediately with no searching required. In this case, the task to remember leads to immediate cognitive closure. Cognitive closure is assumed by the model to elicit the exclusion of extraneous information by either contrast or by rapid switching of directional tendencies. In this case then, being tested successfully with such material should be *exclusive* of the expression of psi apprehensions, and high memory scores should be accompanied by negative ESP scores, while in the unusual instances in which one may be amnestic about such material, a posture of inner searching might be expected. Hence, a negative correlation between ESP and memory of over-learned material is expected.
- In the opposite extreme, material to which one was never conscious of being exposed has never been consciously rehearsed at all, and is termed *incidental memory*. This type of unrehearsed, long-term memory is generally assessed by noting inadvertent responses to information to which one has been exposed incidentally (like recalling the items in a room through which one recently passed without paying attention). In this case, trying to consciously recognize the information is experienced as mere guessing, similar to the experience of taking an ESP test. Since success at this task requires a posture that is the same as that assumed to facilitate extrasensory expressions, a positive correlation between the two is expected.

Summing up then, the model leads us to expect that tests of working memory should be correlated negatively with measures of extrasensory perception. Tests of long-term memory should generally be positively correlated with extrasensory perception, but how well-learned the material is (or strength of association) is an additional consideration. Positive correlations are most strongly expected when material is rather poorly learned (as in incidental memory, in the extreme case), whereas material that is overlearned should show a negative relationship.

Reported Patterns of Correlation

By way of further confirmation of this hypothesis, and of Irwin's observation, two subsequent reports (Kreiman, 1978; Weiner & Haight, 1980) both used designs testing working memory without an interpolated task, and both yielded significant negative relationships. One study (Stanford, 1970) looked for a relationship between ESP and incidental memory, and it reported a significant positive relationship, as this model would predict.

All the studies just cited examined the relation between independent tests of ESP and memory given in the same situation. A different line of work examined the correlation of ESP and memory not only in the same situation, but in the same response (Kanthamani & Rao, 1974, 1975), and our model would expect that the same pattern of results should hold there as well. These were dual-aspect tests, in which participants were given lists of paired associates to memorize, and then tested on their recall with a response sheet that also required a binary choice in the manner of responding, the latter aspect serving as an ESP test. For example, a listt of trigrams (such as FAM or QEN) were each paired with meaningful words and memorized. Then in the memory test, the trigrams alone were presented, with the participant asked to write the associated word. The additional aspect was provided by two possibilities of writing the response, as, for example, in one of two adjoining spaces next to the trigram. The choice of space, participants were told, would serve as an ESP test, as one of the spaces had been picked randomly as a target. One additional variable was sometimes controlled in these studies: association strength. Some of the trigram-word pairs had high association strength (e.g. SOS – help) and some had low association strength (e.g. JUQ – tree). The experimenters expected that ESP and memory would be positively correlated within the trial, that is that memory responses that were correct would tend to be paired with ESP responses that were also correct, and vice versa. Their expectations were born out in a generally consistent way across several series. Palmer (2006) calculated tests for overall significance from their series and found that recall-correct trials were associated with significant psi-hitting, and recall-incorrect trials were associated with significant psi-missing, and the two differed significantly from each other. These series all employed a distraction task of several minutes between memorization and recall, and also provided additional distraction with each trial by the requirement of the ESP response in terms of a placement decision. This makes it appear likely that long-term memory was primarily being sampled. An important additional finding was that in studies in which association strength was controlled, the effect was contributed entirely by the pairs with low association strength. Again, as the model would predict, when something is not too securely learned, the pertinence of the ESP target appears to be enhanced, and it is more likely to be positively expressed in the response.

This effect of a within-trial correlation of memory and ESP was significantly confirmed in one of two series reported by O'Brien (1976). Instead of controlling association-strength, O'Brien controlled degree of normative usage in his word lists. He found that the correlation was evident only with the more rarely used words. Emmerich (1976) also reported a conceptual replication, in that he asked participants to give both a primary and secondary associate to each cue word (they had previously studied a list of jokes from which the cue words were drawn) and also elicited an ESP response in terms of the choice of writing the associates in one of two spaces. He found that memory and ESP correlated significantly and positively when considering the secondary associates, but not the primary associates, as he predicted. This showed again that less securely learned material, evoking less immediate responding, was more likely to carry ESP information. A failure to confirm the effect in a design closely modeled after that of Kanthamani & Rao was reported by Lieberman (1975). Harary (1976) also failed to confirm the effect in a study that departed from all the others in using group testing, suggesting that the heightened meaningfulness provided by individual testing may be important for the expression of the effect. Gambale (1976) and Gambale, Margolis & Cruci, 1976) also failed to confirm the effect, although they used a design that would have permitted participants to make their ESP responses after and separately from their memory responses if they chose, and this would seem likely to bring in the problem highlighted by Irwin (1979) in mixing working and long-term memory.

Summing up this last line of work, it appears that there is considerable evidence that long-term memory and ESP are positively correlated within-the-response, particularly when memory is not very strong, and that expression of the effect may be heightened by experimental designs that preclude the employment of working memory, and by heightening the meaningfulness of the experimental situation by individual attention.

The Importance of ESP Priming in the Context of Long-term Memory

It may be an important matter whether or not participants are informed that they are taking a test of ESP. If they are told, we may say that this extrasensory aspect of potential experience is being primed by the information. Such contextual priming has been found to be important in the processing of subliminal or implicit cues (Blair, 2002), and the logic of our model leads us to expect a similar pattern with ESP. This issue may be examined in a series of studies of the relationship between memory and ESP scores in which ESP items (with unfamiliar content) were imbedded in the context of academic examinations. Students were asked to indicate with each response whether they were completely certain of the correct answer or not. The initial study found a positive correlation between scores on the real items for which answers were not certain, and the scores on the ESP items (Rao & O'Brien, 1977). This confirms the relationship described above, in that ESP and long-term memory were positively correlated as long as recall was not so certain as to be immediate. A number of attempts to replicate this effect were reported with mixed results. Rammohan (1990) reviewed this literature, and although she did not carry out a meta-analysis, she detected a strong trend in which the positive relationship was found in studies in which students were alerted to the presence of the non-academic, ESP questions, but negative relationships tended to be found when the ESP aspect of the situation was not revealed. The 3 significant positive relationships reported were all designs in which the ESP aspect of the situation was revealed, while the 1 significant reversal was in a study in which that was not revealed. Rammohan then carried out two more series to test this hypothesis, one in which the information was revealed and one in which it was not. In both series she found significant relationships in the directions she predicted.

This pattern appears sensible in light of the *First Sight* model. If ESP is not understood to be pertinent (and perhaps particularly in the anxiety-arousing context of an academic examination), preconscious contextual material sensed to be irrelevant to the task at hand would be expected to be subjected to contrast and expressed subtractively in responses by those who are remembering their academic material effectively (high memory accompanied by low ESP). On the other hand, those who are remembering poorly might well cast about for inner "hints" about right answers, and these persons would preconsciously cast a broader net, assimilating more contextual material. Such a situation would produce a negative correlation. However, if extrasensory material is made more salient by the information that some items will be testing for it, then this information should serve as a prime leading that type of apprehension to be sensed as being pertinent, and assimilated additively. Given that ESP apprehensions are understood to be important in the situation, those recalling uncertain but previously seen information effectively would be expected to be responding equally well to extrasensory apprehensions, while those remembering poorly should be equally poor with ESP – hance a positive relationship should obtain. It would be interesting to replicate Rammohan's finding by comparing academic test performance to another testing situation that is more playful in which the results hold no personal consequences. We might predict that in the latter case, not knowing about the extrasensory element might not arouse such a strict contrast response in those remembering well.

Similar Patterns of Functioning

Use of Association. When attempting to recall something about which one is not certain, one searches inwardly, holding open a certain anticipatory "space" in which images, thoughts, associations and feelings are scrutinized for a sense of correctness or pertinence. One consults the internal associative structure of images and feelings, looking for a doorway to the lost item. Actually, both memory studies and parapsychological ones suggest that such associative scanning is a matter of degree, and subject to individual differences. One line of ESP research elicited measures of strength-of-association among a set of target and response words, and used this set in both memory and ESP tests. The investigators were particularly interested in responses that were incorrect. Some participants, in their wrong memory answers, tended to use instead some close associate to the correct response, as if their memories were not exactly right, but were searching the correct neighborhood. Other participants showed no such tendency to rely on close associates when their memories were in error. Then the investigators examined the ESP performance of these two groups of participants. In several studies it was found that those who responded incorrectly with close associates on the memory test, tended to do likewise on their ESP tests when incorrect responses there were examined. Likewise, participants who did not respond with close associates in one situation, did not so in the other as well (Rao, 1978; Rao, Morrison & Davis, 1977; Rao, Morrison, Davis & Freeman, 1977). Partial confirmation was also reported in a further study (Rao, Kanthamani & Palmer, 1990). Palmer (2006) has pointed out that a possible artifact may have inflated some of these results (although not all), but if the effect is found to be reliable, it may be taken as one indication of similar processing of ESP apprehensions and long-term memory.

DOES ESP AFFECT MEMORY RETRIEVAL?

The *First Sight* model predicts that extrasensory apprehensions commingle with memory "traces" at a preconscious level, and should often be discernable either additively or subtractively in the experience of remembering. By the logic of our model, this is in a sense an untestable proposition, since we are assuming that extrasensory apprehensions are always available, and no control condition can be devised in which they are not. But it is still an empirical question how such apprehensions might be used in the effort to remember, and what things might influence such usage. What happens when an experimenter inserts an ESP "source" into a memory task? Several considerations are probably important, among them whether the information "primed" by ESP (for example, a sending agent) is congruent with what was learned or contrary to it, whether or not the participant is told about the ESP dimension of the situation, and how important and desirable correct remembering and ESP-guessing are to the participant in that situation. In all the reports discussed in this section, participants were given memory tests in which certain questions were also "loaded" by having ESP targets associated with them as well, sometimes congruent with the material to be remembered, and sometimes contrary to it.

One line of work was begun by Johnson (1973) on the contribution of ESP to performance in academic examinations, a "real-life" test of memory. In his 3 series, he attached sealed envelopes to the response sheets of essay tests in his psychology courses. In all series he deceived the students about the unusual envelopes, explaining them as something that would speed up test scoring. In two series, the envelopes contained typed information that was correct, applying to half the test questions (chosen randomly). No information was provided pertinent to the other questions. In the third series, half the questions contained misleading information associated with half the questions, and no information pertinent to the others. He found that the students performed better when they were "primed" by correct information relative to no information, and performed more poorly when they were "primed" by incorrect information. Some confirmations of the effect of correct ESP targets '"boosting" the efficiency of memory of the appropriate items have been provided by Braud (1975) and Schechter (1977). The negative effect of ESP targets that are contrary to correct memory targets was also demonstrated by Stanford (1970). In this complex study, ESP targets were assigned to multiple-choice memory items, sometimes congruent with information that had been viewed previously, and sometime incongruent. His participants showed significantly poorer memory performance when the ESP targets were incorrect in terms of memory. Also, when they erred in terms of memory, they gave the ESP target as their response significantly more often than the other incorrect alternatives.

Kreiman (1978) reported a similar intrusion of ESP targets into memory performance in a non-academic test situation. His participants were students in a parapsychology course, and he knew them to be highly interested in the topic of ESP. They were given a short time to memorize a list of words and then tested on their recall. Twenty of the 50 words were randomly picked for each participant to be ESP targets, and this list was given to them in a sealed, opaque envelope. Thinking that the psi-intrusion should be greatest when memory is poorer, he divided each participant's response list in half, and predicted psi-missing on the ESP items in the first halves, and psi-hitting in the second halves. Participants knew that some items would represent an ESP test as well as a memory test, but not which were which, and they were not told of his plan to split their responses. His predictions were confirmed. Some non-significant trends toward confirming this effect were reported by Weiner & Haight (1980) (who used precognition targets with no "prime" in the form of a target list) and Schmeidler (1980, 1981). However, Schmeidler also found that when she carried out a study with participants that were most like Kreiman's (believers in ESP who found the test interesting) the effect was confirmed significantly. She later refined the hypothesis further, and found that when she tested ESP believers who were in a good mood, and restricted the psi-hitting prediction to the bottom quarter of their response lists, the prediction was confirmed significantly in 2 of her 3 series, and in all 3 series pooled. The one non-significant trend was produced by a series in which the ESP aspect of the test was not revealed to the participants, suggesting again that alerting participants to the importance of ESP information seems to facilitate its expression. Lieberman (1976), using a different design, also confirmed the expectation that ESP hitting should be better when memory is weaker, and negative when memory is stronger, but only when his subjects were tested individually (the effect reversed to a non-significant degree when groups were tested). We might speculate that the individual testing situation heightened the participants' interest in the task, making their motivation more comparable to Kreiman's and Schmeidler's more highly engaged participants.

While more work in this area needs to be done, this collection of findings suggests several things. First, information intended by an experimenter (or teacher) to serve as ESP targets can be inadvertently expressed in participants' responses to a memory test. When memory is strong, the expression is likely to be subtractive, as if the unneeded psi information is being subjected to contrast and avoided. When memory is relatively poor, the expression is likely to be additive, as if in the context of uncertainty, the participant consults the ESP apprehensions with more positive, unconscious interest. Additional priming seems to make the intrusion more likely, whether priming the source by attaching odd and somehow important envelopes to answer sheets, or by alerting participants to the presence of a test of ESP that is somehow part of the situation. The latter factor seems to most influence participants who are personally and positively engaged by that possibility. However such priming apparently is not always necessary, as shown by the results of Stanford (1970).

DOES MEMORY AFFECT ESP PERFORMANCE?

How might memory enter as a variable into a person's attempt to express and recognize some information that has been apprehended extrasensorily? The *First Sight* model holds that previously learned information must mingle somehow with extrasensory apprehensions, at least when the learned material is sensed to be pertinent to the ESP task. In tests of ESP that are not also memory tests, the material used for targets will always have some degree of familiarity to participants, depending upon each person's history of exposure to the material, and personal use of it. Material that is familiar enough to feel relevant to the task at hand should be eligible for assimilation. However, ideas so well learned that they predictably evoke fixed associations and patterns of response, should be associated with rapid cognitive closure and cause ESP apprehensions to be turned away. Some work pertinent to this question has just been reviewed in the last section, in which the same items on a test served as responses to both remembered material and ESP targets. One generalization that can be drawn from that is that some exposure may be helpful to ESP hitting but material that is so well learned as to be immediately and accurately retrieved is more likely to be associated with psi-missing.

Some studies suggest that some prior exposure to material to be used as ESP targets, as opposed to no exposure at all, can be helpful to psi-hitting. Kanthamani (1965) found that English-speaking participants who were unfamiliar with Hindi scored positively in ESP tests using English targets and negatively with Hindi targets (the test involved blindly matching sealed cards, so no linguistic understanding was involved in the response with either type of target). In a later study she found (Kanthamani& Rao, 1975) that meaningful 3-letter syllables (e.g. UFO) evoked psi-hitting as targets, and nonsense syllables (e.g. KEQ) evoked psi-missing. Nash & Nash (1968) tested participants with personally meaningful words and with digits picked by the experimenter, and found better performance on the words. In some cases, targets that were more meaningful to the participants (and in that sense, better known to them) evoked psi-hitting relative to arbitrarily provided targets. Dean (1962) found that participants reacted physiologically to names of friends when they were used as targets, but did not react to names of persons known to the experimenter or to names drawn randomly from a phone book. Rao (1962) compared targets chosen by participants to ESP cards, and found hitting with the personal targets and missing with the arbitrary symbols. However, this pattern of preference has sometimes been found in reverse. Skibinsky's (1950) participants were tested with symbols and with names of intimates and they scored significantly negatively (and more extremely) with the names and at chance with the symbols, and Rao (1963, 1964) found that chosen or otherwise more meaningful targets sometimes seemed to induce missing rather than hitting, depending upon other variables. Their responses were made by consciously guessing target content.

Our model suggests that some of these targets (e.g. Skibinsky's names of intimates) may have been too meaningful to evoke positive scoring as targets, inasmuch as they may have evoked instead a clear set of conscious meanings that served to exclude extrasensory material. In this case, more meaningful material would be expected to evoke more extreme scoring (as it did for Skibinsky), but sometimes in a negative direction.

Evidence for a different but perhaps related negative effect has come from a series of studies initiated by Stanford (1967) on response bias. Stanford reasoned that when participants demonstrate an associative bias, such that some target alternative comes much more readily to mind than others, ESP guesses that conform with that bias are less likely to be correct than calls that use the response alternatives that are biased against. He drew an anology to signal-detection theory (the weak ESP signal is drowned out by the "louder noise" of the strong associative habit), and related this to the common experience of noticing some unusual element in a familiar situation. He carried out analyses of data from some high-scoring participants in past research, and found evidence for the hypothesis. For example, the remarkably-scoring Pavel Stepanek, who called the colors green and white, called green more frequently than white. Although his scoring was highly significant on both types of call, it was much higher on the less frequent white calls. Stanford went on to produce some data of his own in several studies to support the hypothesis (Stanford 1967, 1970, 1973), and others have confirmed it as well (Glidden, 1974; Morris, 1971; Palmer & Johnson, 1991; Sargent, 1982). However, some studies have found no effect (e.g. Shrager, 1978). No meta-analysis has been reported, but the negative effect of strong response tendencies has been found often enough that it would seem to represent a frequent if not invariable phenomenon. Pertinent evidence is also provided by several earlier studies that introduced new test material into a series of ESP tests that had been ongoing with small sets of forced-choice material that had become very familiar. In most cases, the fresh material (which had not accrued any associative habits) quickly and significantly produced improved scoring (Cadoret, 1952; Hallett, 1952; Pratt & Woodruff, 1939; Thouless, 1949).

Putting these two lines of work together, we have evidence that psi-hitting in an ESP test is made more likely by some associative familiarity or meaningfulness to the participant, but if it is so entrenched that it evokes a responsive rigidity, it is likely to be associated with negative scoring. One study by Stanford (1973) demonstrated both these effects at once in an interesting way. He gave his participants a word-association test, using cue words that had strong norms for a primary (most frequent) and secondary (next most frequent) associate. He randomly assigned an ESP target to each trial, either the primary or secondary associate (trials were only scored for ESP if one of the two was given). He predicted that some degree of associative strength would facilitate ESP, and expected this to be demonstrated by superior hitting when the target was the primary associate. The results bore out this expectation. However, he also expected a response-bias effect. He expected that the opposite trend, hitting on secondaries and missing on primaries, would be found with participants who gave a preponderance of primary responses (those who had a strong response bias for primaries). This prediction also bore out in the form of a significant interaction effect between type of participant and type of response.

In sum, the studies reported on the effect of degree of prior learning on ESP performance do conform in large measure to the expectations that arise from the *First Sight* model. Some degree of familiarity with target material facilitates a sense of pertinence to the task at hand and makes psi-hitting more likely. An extreme degree of familiarity, accompanied by highly predictable cognitive associates and behavioral responses, leads to such rapid closure that psi-missing is likely. It might be noted here that this expectation is different from the one that might be drawn from signal-detection theory (e.g. Stanford, 1966). A weak signal lost in noise should exert no effect on behavior, not a subtractive (psi-missing) effect. The *First* Sight model suggests that with cognitive closure, the target material is subjected to the process of contrast, and held decisively outside of the response, as evidenced by deviations significantly below chance in that situation. The meaningfulness of target material, inasmuch as this reflects personal familiarity and pertinence, may often predict hitting, but actually the model predicts (Carpenter, 2005b) more generally that scoring with particularly meaningful material should generally be more extreme, and in a positive direction only if other factors make the content seem desirable in the task context. Most of the research reviewed has not reported scoring extremity, however, so this expectation could not be evaluated.

DISCUSSION

In our research literature, the idea that ESP and memory might be related processes arose serendipitously in an unpredicted correlation observed in a pilot study that had other objectives (Feather, 1967). Attempts to confirm the relationship led to interesting but conflicting results, and efforts to conceptualize the matter began trying to catch up.

The *First Sight* model holds that psi apprehensions are continually ongoing, and in their ordinary, everyday functioning, serve unconsciously to anticipate and guide the development of all of our experience. As the mind constructs its experience toward the end of usefully construing it, it unconsciously consults incoming information from whatever source in the light of implicit questions that were posed by earlier sources in the process. These preconscious processes have been studied for a long time, at least since the Wurzburg school of the early 20th century (Gollwitzer, 1990). This model asserts that the earliest source of guiding questions comes from our non-local engagement with reality that we term psi. All of this preconscious processing occurs very quickly as conscious experience flows along. Psi in its most common expression is thus assumed to be quite a normal process, quickly deployed and quickly abandoned, and normally invisible to conscious experience.

The normalization of psi is one aim of the model. I hope with it to suggest ways that the problems of parapsychology should be studied within the context of all that is known of cognitive, sensory and perceptive functions. It implies that the study of such normal psychological processes cannot be complete without reference to psi processes.

As we attempt to know what we are perceiving (or remembering, or creating, or feeling, or intending) the anticipatory questions of any one stage call up ideas from our personal associative network of images, words and feelings for what help they might offer. Thus, in this model psi questions, and memory attempts to answer, all in the light of other input that might be developing in the moment.

At this preconscious stage of experience then, psi and memory must work hand-in-glove. The general expectation that arises from this model is that before experience has been construed, while it is still uncertain and moving toward meaning, both psi and memory should be seen to be contributing their parts, harmoniously and efficiently. Thus, they should be found to correlate positively (if one is contributing effectively, the other should be also), and their contributions should be generally additive, *until the point that some step in the assertion of meaning has made one or the other seem less pertinent to what is developing*. Then they will diverge, and one will contribute positively to the experience (be assimilated) while the other will contribute negatively (be subject to contrast).[2] The various results just reviewed all appear to conform to this basic expectation.

Since psi apprehensions are assumed to begin the process of the development of experience, they should in one sense be the weakest source of influence. They pose the initial questions in the light of which preconscious information is examined; but as soon as some information from the more definitive sources (memory, sensation, desire) appear to contradict their implications, they will retreat obediently into the shadows of contrast, and from thence into the "bound" state of directional balance, where they will not disturb the further development of meaning. Thus the mind protects the "theater of consciousness" (Baars, 1997) from the infinite surround of things that might distract it.

The various findings of parapsychology sometimes have been thought to be so contradictory and disorderly that they must represent an unwitting exercise in self-deception (Blackmore, 1987), or else be a futile attempt to pin down some phenomena that are intrinsically elusive (Kennedy, 2001). It seems likely that our findings are not meaningless but still inchoate. If psi exists, it must be almost thoroughly unconscious in its functioning. If so we are like blind persons studying sight. It is a small wonder that our findings are inductive and groping. We can advance if we can imagine models or theories that tie together what we know and guide it forward. It is in this spirit that the *First Sight* model is proposed. In a recent publication (Carpenter, 2005b) I have sketched how the model has some promise for organizing findings about psi in its relation to memory, perception-without-awareness, and creativity. This paper is a further elaboration of its utility in the area of psi and memory.

REFERENCES

Anderson, M.C., & Green, C. (2001). Suppressing unwanted memories by executive control. *Nature, 410*, 366-369.

Baars, B. J. (1997). *In the theater of consciousness.* New York: Oxford University Press.

Blackmore, S.J. (1987). The elusive open mind: Ten years of negative research in parapsychology *The Skeptical Inquirer, 11*, 244-255.

[2] Can memory contribute negatively to developing experience in a way analogous to psi-missing? Studies on repression and motivated forgetting suggest that this may be so (e.g. Anderson & Green, 2001; Brewin & Andrews, 2000; Singer, 1995).

Blair, I. (2002). The malleability of automatic stereotypes and prejudice. *Personality and Social Psychology Review, 6*, 242-261.

Braud, W.G. (1975). Conscious versus unconscious clairvoyance in the context of an academic examination. *Journal of Parapsychology, 39,* 277-288.

Brewin, C.R., & Andrews, B. (2000). Psychological defense mechanisms: The example of repression. *Psychologist, 13*, 615-617.

Cadoret, R.J. (1952). Effect of novelty in test conditions on ESP performance. *Journal of Parapsychology, 16***,** 192-203.

Carpenter, J.C. (2004). First Sight: Part one, A model of psi and the mind. *Journal of Parapsychology, 68,* 217-254.

Carpenter, J.C. (2005a). Implicit measures of participants' experiences in the ganzfeld: Confirmation of previous relationships in a new sample. *Proceedings of Presented Papers: The Parapsychological Association 48th Annual Convention*, 36-45.

Carpenter, J.C. (2005b). First Sight: Part two, Elaborations of a model of psi and the mind. *Journal of Parapsychology, 69***,** in press.

Dean, E.D. (1962). The plethysmograph as an indicator of ESP. *Journal of the Society for Psychical Research, 41*, 351-353.

DeCoster, J., & Claypool, H.M. (2004). A meta-analysis of priming effects on impression formation supporting a general model of information biases. *Personality and Social Psychology Review, 8*, 2-27.

Emmerich, D. (1976). The effects of word associations on psi-memory interaction. *Journal of Parapsychology, 40,* 56-57.

Feather, S. R. (1967). A quantitative comparison of memory and ESP. *Journal of Parapsychology, 31*, 93-98.

Gambale, J. (1976). Word frequency and association strength in memory-ESP interaction: A failure to replicate [Abstract]. *Journal of Parapsychology, 40*, 339-340.

Gambale, J, Margolis, F., & Cruci, K. (1976). The relationship between ESP and memory – and attempted replication with modifications [Abstract]. *Journal of Parapsychology, 40*, 340.

Glidden, S.H. (1974). A random-behavior maze test for humans. *Journal of Parapsychology, 38*, 324-331.

Gollwitzer, P. M. (1990). Action phases and mind-sets. In E. T. Higgins & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition*, (Vol. 2, pp. 53-92). New York: Guilford Press.

Hallett, S. J. (1952). A study of the effect of conditioning on multiple-aspect ESP scoring. *Journal of Parapsychology*, 16, 204-211.

Harary, S. B. (1976). A study of psi, memory and expectancy. In J. D. Morris, W. G. Roll & R. L. Morris (Eds.), *Research in Parapsychology 1975. (*pp. 121-126). Metuchen, NJ: Scarecrow Press.

Irwin, H. J. (1979). *Psi and the mind.* Metuchen, NJ: Scarecrow Press.

Johnson, M. (1973. A written academic exam as a disguised test of clairvoyance. In W.G. Roll, J.D. Morris, & R.L. Morris (Eds.) *Research in parapsychology 1972* (pp. 28-30). Metuchen, NJ: Scarecrow Press.

Kanthamani, B.K. (H.) (1965). A study of the differential response in language ESP tests. *Journal of Parapsychology, 29,* 27-34.

Kanthamani, H., & Rao, H. H. (1974). A study of memory-ESP relationships using linguistic forms. *Journal of Parapsychology, 38*, 286-300.

Kanthamani, H., & Rao, H. H. (1975). Response tendencies and stimulus structure. In J. D. Morris, W. G. Roll & R. L. Morris (Eds.), *Research in Parapsychology 1974. (*pp. 154-177). Metuchen, NJ: Scarecrow Press.

Kennedy , J.E. (2001). Why is Psi so Elusive? A Review and Proposed Model. Journal of Parapsychology, *65,* 219-245

Kohler, W. (1947). *Gestalt psychology: An introduction to new concepts in modern psychology.* New York: Liveright Publishing.

Kreiman, N. (1978). Memoria secundario y ESP. *Cuadernosde Parapsicología, 3,* 3-12.

Lieberman, R. (1976). Role of varied time interval and association strength I memory-ESP interaction for group and individual testing. In J. D. Morris, W. G. Roll & R. L. Morris (Eds.), *Research in Parapsychology 1975. (*pp. 126-129). Metuchen, NJ: Scarecrow Press.

Morris, R.L. (1971). Guessing habits and ESP. *Journal of Parapsychology*, *35,* 335-336.

Nash, C.B., & Nash, C.S. (1968). Effect of target selection, field dependence, and body concept on ESP performance. *Journal of Parapsychology, 32,* 249-257.

O'Brien, D.P. (1976). Recall and recognition processes in a memory-ESP paired-associate task. *Journal of Parapsychology, 40*, 57-58.

Palmer, J. (1978). Extrasensory perception: Research findings. In S. Krippner (Ed.), *Advances in parapsychological research 2* (pp. 59-243). New York: Plenum Press.

Palmer, J. (1982). ESP research findings: 1976-1978. In S. Krippner (Ed.), *Advances in parapsychological research 3* (pp. 41-82). New York: Plenum Press.

Palmer, J. (2006). Memory and ESP: A review of the experimental literature. *6 Simposio da Fundação Bial: Behind and Beyond the Brain.* Porto: Casa do Médico.

Palmer, J., & Johnson, M. (1991). Defensiveness and brain hemisphere stimulation in a perceptually mediated ESP task. *Journal of Parapsychology, 55,* 329-348.

Parker, K. (1976). A study of immediate memory and ESP. In J. D. Morris, W. G. Roll & R. L. Morris (Eds.), *Research in Parapsychology 1975. (*pp. 130-134). Metuchen, NJ: Scarecrow Press.

Posner, M.I., Petersen, S.E., & Fox, P.T. (2002). . Localization of cognitive functions in the human brain. In D.J. Levitin (Ed.), *Foundations of cognitive psychology: Core readings.* (pp. 819-830). Cambridge, MA: MIT Press.

Pratt, J.G., & Woodruff, J.L. (1939). Size of stimulus symbols in extrasensory perception. *Journal of Parapsychology*, *3***,** 121-158.

Price, H. H. (1949). Psychical research and human personality. *Hibbert Journal*, *47*, 105-130. (Reprinted in J. R. Smythies (Ed.), *Science and ESP*. New York: Humanities Press, 1967.)

Rammohan, V.G. (1990). Psi in the academic context: Two further studies. *Journal of Parapsychology, 54,* 229-244.

Rao, K.R. (1962). The preferential effect in ESP. *Journal of Parapsychology*, *26*, 252-259.

Rao, K.R. (1963). Studies in the preferential effect. I. Target preference with types of targets unknown. *Journal of Parapsychology, 27*, 23-32.

Rao, K.R. (1964). The differential response in three new situations. *Journal of Parapsychology, 28,* 81-92.

Rao, K. R. (1978). Further studies of memory and ESP. *Journal of Parapsychology*, *42*, 167-178.

Rao, K.R., Kanthamani, H., & Palmer, J. (1990). Exploring normal/paranormal interaction within a memory-ESP testing paradigm . *Journal of Parapsychology*, *54*, 245-259.

Rao, K.R., Morrison, M., & Davis, J.W. (1977). Paired-associates recall and ESP: A study of memory and psi-missing. *Journal of Parapsychology*, *41*, 165-189.

Rao, K.R., Morrison, M., Davis, J.W., & Freeman, J.A. (1977). The role of association in memory recall and ESP. *Journal of Parapsychology, 41*, 190-197.

Rao, K.R., & O'Brien, J.T. (1977). ESP performance in classroom and examination settings. *Journal of Parapsychology, 41,* 1-9.

Roll, W.G. (1966). ESP and memory. *International Journal of Neuropsychiatry, 2,* 505-521.

Sargent, C.L. (1982). An unusually powerful response-bias effect. *Parapsychology Review, 13,* 8-10.

Sarason, I.G. (1984). Stress, anxiety, and cognitive interference. *Journal of Personality and Social Psychology, 46,* 929-938.

Schacter, D.L. (1996). *Searching for memory: The brain, the mind and the past.* New York: Basic Books.

Schechter, E.I. (1977). Nonintentional ESP: A review and replication. *Journal of the American Society for Psychical Research***,** *71*, 337-374.

Schmeidler, G.R. (1980). Does ESP influence the recall of partially learned words? [Abstract]. In W.G. Roll (Ed.), *Research in parapsychology 1979* (pp 54-57). Metuchen, NJ: Scarecrow Press.

Schmeidler, G.R. (1981). ESP and memory: Support for Kreiman's summary hypothesis [Abstract]. In W. G. Roll (Ed.), *Research in parapsychology 1980* (pp. 118-120). Metuchen, NJ: Scarecrow Press.

Schmeidler, G.R. (1988). *Parapsychology and psychology: Matches and mismatches.* Jefferson, NC: McFarland.

Schwartz, N., & Bless, H. (1992). Constructing reality and its alternatives: An inclusion/exclusion model of assimilation and contrast effects in social judgments. In L. L. Martin & A. Tesser (Eds.), *The construction of social judgments* (pp. 217-245). Hillsdale, NJ: Lawrence Erlbaum Associates.

Shrager, E.F. (1978). The effect of sender-receiver relationship and associated personality variables on ESP scoring in young children. *Journal of the Society for Psychical Research, 72,* 35-47.

Singer, J.L. (1995). Repression and dissociation: Implications for personality theory, psychopathology, and health. Chicago: University of Chicago Press.

Skibinsky, M. (1950). A comparison of names and symbols in a distance ESP test. *Journal of Parapsychology, 14,* 140-156.

Solley, C. M., & Murphy, G. (1960). *Development of the perceptual world.* New York: Basic Books.

Stanford, R.G. (1966). The effect of restriction of calling upon run-score variance. *Journal of Parapsychology, 30,* 160-170.

Stanford, R.G. (1967). Response bias and the correctness of ESP test responses. *Journal of Parapsychology, 31,* 280-289.

Stanford, R. G. (1970). Extrasensory effects upon "memory." *Journal of the American Society for Psychical Research.* 64, 161-186.

Stanford, R.G. (1973). Extrasensory effects upon associative processes in a directed free-response task. *Journal of the American Society for Psychical Research, 67*, 147-190.

Thouless, R.H. (1949). A comparative study of performance in three psi tasks. *Journal of Parapsychology, 13***,** 263-273.

Weiner, D.H., & Haight, J. (1980). Psi within a test of memory: A partial replication. In W.G. Roll (Ed.), *Research in parapsychology 1979* (pp. 52-53). Metuchen, NJ: Scarecrow Press.

THE SLIDE-SHOW PRESENTIMENT EFFECT DISCOVERED IN BRAIN ELECTRICAL ACTIVITY

Thilo Hinterberger[1,2], Petra Studer[2], Marco Jäger[2], Colette Haverty-Stacke[1], & Harald Walach[1]

[1]Division of Social Sciences, University of Northampton, UK

[2]Instituteof Medical Psychology and Behavioral Neurobiology, University of Tübingen, Germany

ABSTRACT

The presentation of pictures evokes clearly detectable responses in the electroencephalogram (EEG). Here, the question is addressed whether people show, as a paranormal effect, a pre-stimulus response prior to a sudden appearance of pictures. This presentiment effect could be visible in EEG activity even when people are not consciously aware of it. A study was carried out with 20 participants being exposed at randomised times to affective and non-affective pictures and to checkerboard stimuli. The pre-stimulus epochs for these stimuli were compared to pre-stimulus epochs before a hidden stimulation. A non-parametric statistical approach was chosen for the analysis of the one-second pre-stimulus interval. With checkerboard stimulation, only a marginally significant presentiment effect could be detected at the Pz electrode. Considering all picture stimuli, the analysis of all cortical channels merged revealed a significant increase of the EEG activity (z=1.71). Considering the affective pictures only, the significance was z=2.02. The difference between affective and neutral pictures revealed significant z-scores greater than z=2.0 at four of the six electrode positions. A control condition in which the monitor was covered showed no significant difference between the affective and neutral targets. The contrast of visible and covered picture stimulation revealed significance at C3 with $p<0.02$. For the visible pictures, the amplitude rankings at Cz were shifted towards higher ranks with p=0.01. The power in the delta band was significantly decreased with p=0.006 in picture stimulation. The checkerboard stimulation remained non-significant in the comparison between visible and covered conditions. The significant decrease in the eye movement channel during the pre-stimulus period for the visible conditions can be explained by a systematic eye blink of the participants at or after stimulus presentation which was less frequent before.

The results suggest the possible existence of an abnormal presentiment effect. As it is not visible in the averaged EEG curves this effect may not be time-locked to the stimulus and different for each participant. The missing significances for neutral pictures and checkerboard stimuli suggest that emotional affectivity is important for a presentiment reaction in the EEG. A tendency towards compensatory behaviour of pre-stimulus activity can be explained by theories such as the decision augmentation theory or the weak quantum theory.

INTRODUCTION

The investigation of anomalous anticipatory nervous system responses, was, as noted by E.C. May (2005), initiated by Z. Vassy in the 1960s (Vassy 1978). Vassy's controlled study, which combined searches for anticipatory and telepathic phenomena, found significant skin conductance increases in receiver participants on their having been sent telepathic warning messages prior to receiving mild electric shocks, compared to controls. Vassy later successfully replicated this result (Vassy 2003). However, his 2005 study, with some equipment and protocol changes showed no significant results.

J.W. Hartwell (1978) used electroencephalographic measurements (EEG) to look for anomalous occurrences of the CNV (Contingent Negative Variation) anticipatory response to randomly presented pictures of male or female faces but did not find any significant effects.

Almost two decades after Vassy's 1978 publication Dean I.Radin (1997) carried out a series of three physiological studies, adding heart rate and fingertip blood volume to galvanic skin response (GSR) measurements to provide an array of autonomic nervous system responses for examination. In all three studies, involving randomly presented stimuli of pictures with either calm or emotional images, significantly different autonomic responses were found prior to stimulus exposure, according to whether the as yet unseen picture was calm or emotional. The effect was greatest for the skin conductance variable.

Radin and Bierman as well as a third independent colleague tested a range of normal explanations for the results and concluded that they did not apply, and that therefore the findings suggested a genuine occurrence of an anomalous phenomenon, which Radin labeled the “presentiment effect“.

Bierman later performed a replication experiment (Bierman and Radin, 1998) involving three studies which used the same method and similar picture stimuli (with the emotional variable now sub-divided between violent and erotic categories), but completely different hardware, software and randomization procedures, to reduce the likelihood of repetition of undiscovered influences from technical artifacts or randomization.

Significant positive GSR differences between emotional versus calm results were again obtained for all three studies, although the effect size was almost three times greater for the first than for the subsequent two studies. There was a significant effect also for the erotic-violent variable but the direction of effect was inconsistent across the two participant groups.

There were some differences in procedures between Studies 1, 2 and 3 and in the participant groups between Studies 1 and Studies 2 and 3. It is possible that gender, age and attitude differences between the two groups of participants could account for the strikingly different result patterns between the first and the second and third studies as the participants in Study 1 (N = 16, 3 male, 13 female) were drawn from a group of health care professionals studying Therapeutic Touch while those who participated in both Studies 2 and 3 were 32 university students, 16 male, 16 female and 7 of whom rated themselves as skeptical about paranormal phenomena.

Bierman also found a presentiment effect predominantly in affective pictures in the BOLD response using functional MRI (Bierman & Scholte, 2000). Broughton (2004) reported an unsuccessful presentiment replication attempt.

In the present study a possible presentiment effect is investigated in the variability of EEG activity during a one second pre-stimulus interval. Therefore, similarly to Bierman, affective and neutral pictures were presented and, additionally, meaningless checkerboard stimuli. The analysis focuses on the increase or decrease of the EEG activity in averaged stimulus epochs in the time-series as well as different frequency bands compared to arbitrarily averaged epochs of the same EEG. As the time-series of different participants are not just averaged, this method is also sensitive to different effect curves for individual participants.

METHODS

Participants

This study was part of a larger study, which investigated stimulus-related EEG activity in a non-stimulated participant sitting in a different room from the stimulated participant. To investigate a possible presentiment effect before stimulation we focus on the EEG activity of only the stimulated participants. Each of 20 healthy participants (13 females, 7 males, age 19 to 51, mean 26 years) attended one session in which they were exposed to picture or checkerboard stimuli. All participants gave informed consent to the experiment.

Experimental Setup

The participants were seated in a small electromagnetically shielded room. For presentation of the stimuli they were seated in front of a 17 inch TFT computer monitor which was placed approximately 1 meter in front of them. Eleven sintered Ag/AgCl electrodes were affixed to the participant’s head with Elefix electrode paste to measure the EEG at the following positions: Cz, C3, C4, Fz, Pz, Oz, left and right mastoid, two electrodes, one above and one beneath the right eye for recording the electrooculogram (EOG), and one ground electrode on the forehead. The vertical EOG was recorded for offline correction of eye-movement artifacts such as blinks. Skin/electrode impedance was kept below 5kOhm. The participants were asked to wear ear plugs in order to minimize possible acoustic disturbances by external sounds. An 8 channel EEG8 amplifier (Contact Precision Instruments, Inc.) was connected to a 16 bit A/D converter in a PC running with Windows 2000 operating system. The PC was housed in a separate control room. The Thought-Translation-Device Software (Hinterberger et al 2003) was used for displaying the stimuli as well as for data acquisition and storage. A photo diode, registering precise onset of visual stimuli, was positioned at the monitor of the stimulated participant. EEG recordings were within an amplitude range of +/- 1mV at a sampling rate of 512Hz. An analogue band pass filter with cut-off frequencies at 0.01 and 40 Hz and a notch filter were applied. In addition to the photo diode, digital markers generated by the stimulation program were recorded synchronously with the EEG data in order to mark stimulus onsets.

Stimulation

Each participant was exposed to various stimulus conditions which were encapsulated in different runs. One run comprised 80 stimuli and lasted for approximately 8 minutes. The conditions were visible and covered stimulus presentation with stimuli including the alternating checkerboard images, affective and neutral pictures and black screen.

Visibility conditions: The control condition in which no effect would be expected was defined as the participant not being stimulated. This was achieved by covering the presenting monitor with a black and opaque sheet of paper. It should be noted that the whole environmental setup (electromagnetic fields, etc.) is otherwise kept the same for the covered condition, thereby controlling for possible artifacts from factors unrelated to the visual stimulation of the participants.

In a second type of control condition no pictures were presented on the hidden screen. If the results of the covered condition showed no effect, the blank screen and covered picture trials could be merged and compared with the visible picture condition.

Stimulus types: The participant was presented with either alternating checkerboard stimuli or images from the International Affective Picture System (IAPS). Each stimulus epoch consisted of a one-second pre-stimulus interval and either a one-second picture presentation or a 1.2s checkerboard presentation. Inter-stimulus intervals varied randomly from 3 to 6 seconds. The randomization was carried out before the start of the experiment. For each run and each participant an individual set of 80 stimulus onset times was chosen. An eighty-first black screen stimulus was included right at the beginning of each run.

The checkerboard stimuli were chosen according to a study done by Wackermann et al. (2003, 2004). The checkerboard pattern consisted of an array of 16 x 12 black and white squares. The stimulus interval was 1.2s long comprising the pattern presentation and three pattern reversals, following each other after 250ms, while the last pattern remained visible for another 200ms. 80 of these stimuli were presented within one run.

For the picture stimulation a randomized set of 40 affective and 40 neutral pictures was presented to the participant in each run. The stimuli were randomly chosen out of a set of 120 affective and 120 neutral pictures. An IAPS picture was regarded as ‘affective’ when rated as unpleasant showing a high arousal and negative valence. A picture was regarded as ‘neutral’ when rated as pleasant or neutral by showing a low arousal and positive valence. Each picture was presented for one second after a one second pre-stimulus interval. Table 1 gives an overview of the experimental conditions and the stimuli.

TABLE 1:

OVERVIEW OF THE STIMULI PRESENTED TO THE 20 PARTICIPANTS

Visibility condition	Visible		Covered (control condition)		
Stimulation type	checkerboard	mixed pictures	checkerboard	mixed pictures	black
Number of stimuli	80	80 affective 80 neutral	80	40 affective 40 neutral	80
Run no.	1, 2, or 3	2 runs from 1-3	4, 5, or 6	4, 5, or 6	4, 5, or 6

Procedure

One session consisted of the following phases as illustrated in Figure 2.

As this study was part of a study with two participants sitting in different rooms, the presentiment study participant had to first spend 10 minutes either together with a non-stimulated participant for tuning in or alone just relaxing. Each participant was exposed to three runs of 80 stimuli, two runs showing pictures and one run showing the checkerboard stimuli. Prior to the experiment the sequence of the runs was chosen randomly for each participant and differently for each run. After a break of about 20 minutes the participants carried out a second tune-in phase. Then, for the following three runs, the monitor was covered with a black paperboard. The stimuli presented on the screen could not be seen, although the system and the electromagnetic environment were kept the same as before. Three randomized runs, one of checkerboard stimuli, one of picture stimuli, and one without any stimuli (blank screen), were presented behind the black paperboard – again in randomized sequence. Instead of a second run with covered picture stimulation a run with black screen pictures was inserted. This reduced the statistical power of the covered picture condition. However, as the covered condition elicited no visible post-stimulus evoked response, it was intended to serve as control condition in which the type of hidden stimulus would not be important. Pooling all picture stimuli leads to the same statistical power for the visual and covered condition.

Analysis

Data analysis was performed similarly to the method developed by Wackermann et al. (2003, 2004) using Matlab 7.2 (The Math Works, Inc. Natick, MA, USA).

Pre-processing

The data from each condition (uncovered/covered) for each participant were pre-processed separately. In a first step the data of the seven data channels (A1, A2, C3, C4, Fz, Pz, and Oz) and the vEOG channel were transformed into their microvolt equivalents. The following signal processing steps were carried out in sequence:

1. Down sampling: all data sets were down sampled from 512 to 256 samples/s.
2. EOG artifact correction: For each participant and EEG channel a correction factor was determined by taking into account the influence of eye movements and blinks recorded in the EOG on each electrode. All EEG data were corrected by subtracting the weighted EOG from each channel. For detailed description of the method see Hinterberger et al. (2005).
3. Signal Merging: All cortical electrodes have a non-negligible interdependency. As the comparison of highly independent measures was preferred, we merged the signals of all cortical electrodes (Cz, Fz, Pz,C3, C4) and referenced them to the mastoids (A1 and A2).
4. Band pass filter 1: Despite the EEG having been recorded in a range from 0.01 Hz to 40 Hz, the slow cortical potentials below 1 Hz were not of interest for this analysis and therefore filtered out. A 24dB/octave Butterworth band-pass filter was applied from 1 to 30 Hz. A low pass filter with cut-off at 10 Hz was applied to the EOG.
5. Detection of artifacts: High amplitude artifacts in the EEG were defined as amplitude values higher than +/-5 standard deviations of the signal. The EEG was limited to these amplitudes.
6. Re-referencing: In the recordings Cz was selected as the reference electrode. To conform with standard EEG analysis all cortical electrodes were re-referenced to the mastoids at A1 and A2. This led to a set of the following 8 channels being used for further analysis:

   1. Merged 6 cortical EEG electrodes referenced to mastoids, 2. Cz – mastoids, 3. C3 – mastoids, 4. C4 – mastoids, 5. Fz – mastoids, 6. Pz – mastoids, 7. Oz – mastoids, 8. Vertical EOG.

The whole data set was then separated according to the conditions of visibility (visible, covered) and stimulation type (affective and neutral pictures, checkerboard or black screen).

Statistical Analysis

The whole epoch duration of one second backward from stimulus onset was chosen for the search of a pre-stimulus response as we do not know when the presentiment effect might occur. For peripheral physiological measures such as skin conductance a presentiment effect was observed more than one second before the stimulus onset. Usually, shorter latencies are expected with EEG. As a pre-assumption in this experiment, we therefore search the anomalous effect during the one second before stimulus onset.

Grand average: In a first step the grand average A_t over all stimuli N of each condition was calculated after subtraction of its mean amplitude:

$$(1) \quad A_t = \frac{1}{N}\sum_{n=1}^{N}(u_{n,t} - \bar{u}_n) \quad \text{with } \bar{u}_n = \frac{1}{T}\sum_{t=-1}^{-T} u_{n,t} \qquad (t = -1, ..., -T)$$

where $u_{n,t}$ is the preprocessed signal amplitude of the nth data epoch at sample time index t in the analysis epoch T which was chosen one second backward from stimulus onset (T=256 samples, i.e. 1s). N is the total number of stimuli for a certain condition.

Comparison to arbitrary onsets: A non-parametric statistical approach was used to compare average amplitudes in the stimulus epoch to amplitudes in averaged epochs of the same length but arbitrary starting points, starting from 1000 randomly chosen sets of virtual stimulus onsets which have not been used as real stimulus onsets. These 1000 arbitrary virtual epochs were calculated in the same fashion as the real onsets from 1000 randomly chosen onset points from among the whole range of data: A random starting point in the file was chosen as first virtual stimulus. Consecutive virtual stimulus onsets followed after random virtual inter-stimulus-onset intervals of between 4 to 7 s. The data files of each condition were then averaged according to equation (1) resulting in a set of 1000 arbitrary $A_{t,i}$ with i=1..1000.

To exclude the possibly higher signal amplitudes during the stimulus presentation in the EEG which would disturb the comparability of pre-stimulus and random intervals the whole analysis was also done with random selections excluding the two seconds after stimulus onset. This method led to similar results, therefore, we report the results from using the first approach for the non-visible conditions and the second approach for the visible conditions.

The *absolute amplitude* $\hat{A}_t$ of the average signal of the 'real' stimulus epochs as well as of the 1000 selections of 'arbitrary periods' was computed by taking the square root of the squared values time points t

$$(2) \quad \hat{A}_t = \sqrt{A_t^2} \text{ and } \hat{A}_{t,i} = \sqrt{A_{t,i}^2} \text{ with i=1..1000}$$

Normalization: In order to make the absolute amplitudes comparable within one participant as well as inter-individually, a reference value was calculated as the median of $\hat{A}_t$ of the 1000 arbitrary periods for all t. For normalization Q_t ratios were calculated according

$$(3) \quad Q_t = \hat{A}_t \big/ \hat{A}_{\mathrm{Ref}} \quad \text{with } \hat{A}_{\mathrm{Ref}} = \frac{1}{T}\sum_{t=1}^{T}\hat{A}_t \ .$$

The same was done for all I = 1000 selections leading to $Q_{t,i}$.

Sorting and ranking: The $Q_{t,i}$ of each condition and each time t were sorted according to their magnitude. $Q_{t,1}$ now carries the lowest and $Q_{t,1000}$ the highest value. A rank R_t was defined by the index i whose $Q_{t,i}$ was closest to the Q_t of the real stimulus sequence. With a rank higher than 950 the corresponding averaged amplitude $\hat{A}_t$ can be regarded as being significantly higher than chance, because less than 5% of the arbitrary averages reached higher levels. In a two-sided test of increase or decrease of the amplitude, the rank has to be greater than 975 or smaller than 25 to achieve significance on a 5% level. Therefore, the rank can be used to determine the probability of a given amplitude having been obtained by chance with the same dataset.

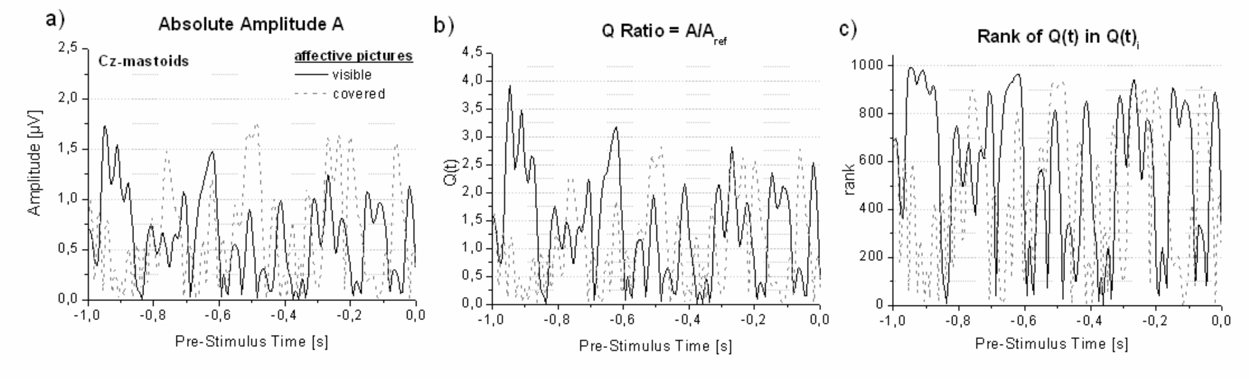

Figure 1 Illustration of 3 analysis steps exemplarily shown for participant 1 and for the 1 second pre-stimulus window. In a) the absolute amplitude A at Cz is depicted for the visible and covered affective pictures separately. The corresponding Q ratios are shown in b) and the rankings into the 1000 arbitrary selected Q_i are plotted in c).

Epochal analysis: The ranking statistics was performed separately for each time in the analysis epoch. The question arises: How can the ranking of the whole epoch be merged into one significance value?

Solution 1: Integration of the whole epoch: The most comprehensive way to include all the rankings in the analysis epoch is to calculate the average $Q' = \frac{1}{T}\sum_{t=1}^{T} Q_t$ during the one second pre-stimulus interval. Then, a further ranking procedure was needed that gives the significance for the average pre-stimulus response being greater or smaller than the average rank of 500. Therefore, the 1000 arbitrary one second Q_j needed to be averaged into Q'_j. and ranked as described above.

Merging of all participants:

To merge all participants the ranks for each condition and participant had to be transformed into *z*-scores. These *z*-transformed values were averaged across all participants resulting in z^{rank}:

$$(4) \quad z^{rank} = \frac{1}{\sqrt{M}} \sum_{j=1}^{M} \Phi^{-1}(r_j)$$

where r_j denotes the rank of the j-th participant rank and M the number of participants (M=20). Φ^{-1} denotes the inverse Gaussian cumulative distribution function, which is calculated using the probability density function of a normalized Gaussian distribution as well as the cumulative distribution function of a normalized Gaussian distribution calculated by means of the error as well as complementary error function . These statistics were calculated separately for both conditions ‘visible’ (z_{vis}^{rank}) and ‘covered’ (z_{cov}^{rank}) and for each electrode site. The two conditions were compared by calculating the normalized difference:

$$(5) \quad z^{diff} = \frac{z_{vis}^{rank} - z_{\mathrm{cov}}^{rank}}{\sqrt{2}}$$

again for each electrode site individually.

Solution 2: Histogram of ranks: To express the significance for the amplitudes during the pre-stimulus interval being greater or lower, a second approach can be followed which should lead in principle to a similar result. This second approach was chosen as we were interested in the distribution of the rankings. A histogram of the ranks of *Q(t)* as shown in Figure 1c) can be calculated by sorting the number of ranks for all samples and participants into bins which are in a certain range. 40 bins were defined ranging from 1 to 1000 resulting in a range of 25 per bin. E.g., bin 40 contains the number of rankings from 976 to 1000.

On average, each bin should contain 20 participants * 256 samples / 40 bins = 128 counts. For the stimulus *Q(t)* not being different from the arbitrary selections, the histogram should show no trend towards higher or lower bins. Therefore, an abnormal pre-stimulus response should be detectable in a linear trend of frequencies across the bins in the histogram curves. However, as the ranks are not equally distributed, they either have to be transformed into *z*-scores, or to use a non-parametric statistics, the regression coefficients have to be ranked into again 1000 histogram regression coefficients from the arbitrary rankings. The latter method was chosen to obtain a significance value for the regression of the rankings histogram.

Post-hoc inclusion of frequencies

After the first analysis of the time series data as defined prior to the study we decided to include a frequency band power analysis on the merged cortical EEG channel data. The following bands were separated: Delta (1-4Hz), Theta (4-8Hz), Alpha (8-12Hz), Beta1 (12-20Hz), Beta2 (20-30Hz), Gamma (30-40Hz). In order to analyze changes in the frequency domain a series of steep (48dB/octave) band bass filters were applied to separate oscillations in the Delta-band, Theta-band, Alpha-band, Beta-1-band which also includes the sensory motor rhythm, the Beta-2-band, and the Gamma-band. The band intensity was obtained by taking the square root of the squared amplitudes. In contrast to the time-series analysis, the band power artifacts were limited to ten times its average amplitude in each frequency band. Additionally, a smoothing Savitzky-Golay filter was applied on the amplitudes of each band for smoothing the data without producing phase shifts. The further analysis is done in the same manner as the time series analysis.

RESULTS

Qualitative Inspection of Grand Average

The visual inspection of the one second pre-stimulus epochs for the different stimulus conditions, electrodes and participants revealed no obvious response. Figure 1 exemplarily shows for the Cz electrode and the affective picture stimulation the grand average curves over all participants.

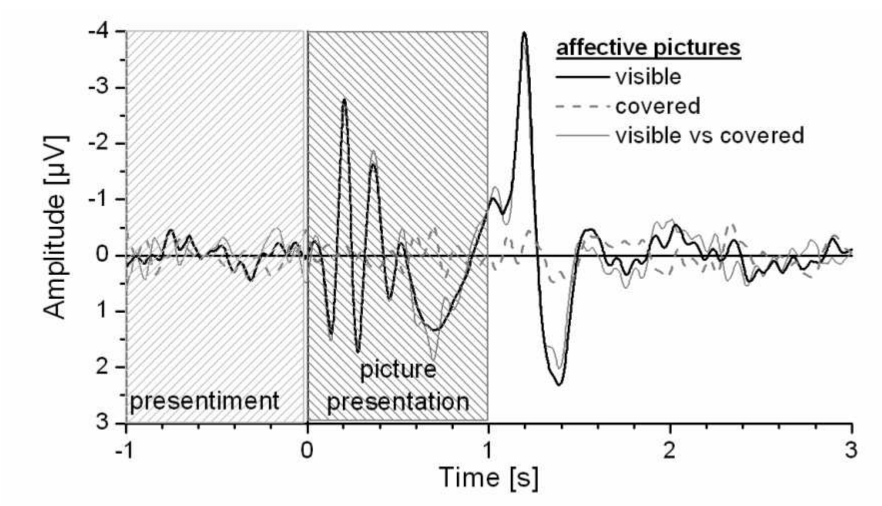

Figure 2 Grand average of the EEG electrode Cz vs. mastoids over all stimulus epochs of the affective pictures and all 20 participants. In the visible condition 1600 stimulus epochs were averaged; the covered condition comprised 800 epochs. The evoked response on the disappearing picture showed a even higher amplitude. A presentiment effect during the second before the stimulus onset at zero seconds is not obvious.

Solution 1: Ranks of z-scores

The results from Solution 1 for merged rankings are shown in Table 2. Positive *z*-scores indicate that the average relative amplitudes during the pre-stimulus interval are higher than those in arbitrary intervals. Negative *z*-scores indicate decreased amplitudes.

TABLE 2:

RESULTS OF Z-SCORES FOR THE RANKINGS FOR ALL 20 PARTICIPANTS MERGED.

***Z*-scores**	**Visible**				**Covered**				
Stimulus type	**All Pix**	**Affective Pix**	**Neutral Pix**	**Check**	**All Pix**	**Affective Pix**	**Neutral Pix**	**Check**	**Black**
All electrodes	***1,71***	***2,02***	-0,42	-0,12	-0,85	-0,33	0,66	0,85	0,42
Cz-mastoids	1,57	***1,84***	-1,03	-0,13	-1,17	-0,70	0,68	1,12	0,59
C3-mastoids	0,42	1,38	-1,73	0,64	-0,85	-0,76	1,09	0,87	0,46
C4-mastoids	1,30	1,31	-0,62	0,29	-1,11	0,12	0,42	0,40	0,90
Fz-mastoids	0,47	-0,51	-0,19	0,98	-0,69	-0,15	0,43	1,22	0,99
Pz-mastoids	1,29	***2,12***	-1,10	0,49	-0,56	-0,55	-0,09	***1,69***	1,38
Oz-mastoids	0,65	***2,19***	-0,82	-1,04	-0,58	0,36	-0,85	0,58	0,73
Vertical EOG	***-1,99***	***-2,66***	-1,15	***-2,54***	-1,12	-0,80	0,30	0,45	-0,54

The two-tailed significance threshold for *p*<0.05 is +/-1.96, the one-tailed threshold is 1.65.

TABLE 3:

CONTRASTS BETWEEN DIFFERENT CONDITIONS. Z-SCORES FOR THE RANKINGS FOR ALL 20 PARTICIPANTS MERGED.

***Z*-scores**	**Visible**	**Covered**	**Visible vs Covered**				
Stimulus type	**Affect-Neutral Pix**	**Affect-Neutral Pix**	**Aff-Neu Pix**	**All Pix**	**Affective Pix**	**Neutral Pix**	**Check**
All electrodes	***1,72***	-0,70	***1,71***	***1,81***	***1,66***	-0,76	-0,69
Cz-mastoids	***2,03***	-0,97	***2,12***	***1,94***	***1,79***	-1,21	-0,89
C3-mastoids	***2,20***	-1,31	***2,48***	0,89	1,52	***-1,99***	-0,16
C4-mastoids	1,37	-0,21	1,11	***1,70***	0,84	-0,73	-0,08
Fz-mastoids	-0,23	-0,41	0,13	0,82	-0,26	-0,44	-0,17
Pz-mastoids	***2,28***	-0,32	***1,84***	1,31	***1,88***	-0,72	-0,85
Oz-mastoids	***2,13***	0,85	0,90	0,87	1,30	0,02	-1,15
Vertical EOG	-1,07	-0,77	-0,21	-0,62	-1,32	-1,03	***-2,11***

The two-tailed significance threshold for p<0.05 is +/-1.96, the one-tailed threshold is 1.65.

Considering all picture stimuli, the analysis of all cortical channels merged revealed a significant increase of the EEG activity before presentation of an affective picture (*z*=2.02) compared to the 1000 arbitrary intervals. Remember that this increased activity is not visible in the grand average over all participants (cf. Fig. 2). A significant *z*-score could also be seen at the Cz electrode with the affective pictures (*z*=1.84). No significant change in the EEG activity was found in the covered stimulation. The contrast between affective and neutral picture presentation was significant with *z*-scores greater than 2 at Cz, C3, Pz, and Oz electrode positions. The covered condition showed no significant change in any channel for the contrast between affective and neutral stimuli. No significant presentiment effect could be detected with checkerboard stimulation during the one second pre-stimulus interval. A classically explainable decrease of activity before stimulation could be detected in the visible stimulation when not contrasting the conditions.

Solution 2: Histogram of ranks

For the visible pictures, the amplitude rankings at Cz were shifted towards higher ranks with p=0.01. A highly significant decrease of the power in the delta band (p=0.002) in picture stimulation was accompanied by an increased power in the covered condition which is hardly explainable by classical theories.

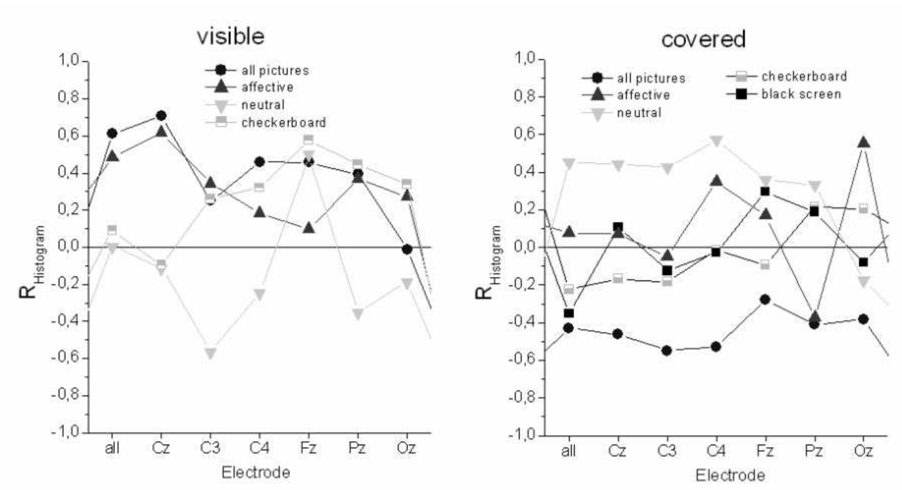

Figure 3 The regression coefficients of the histogram of ranks including all participants are depicted for each electrode and condition. The left side displays the visible stimuli which tend to show higher or more positive coefficients than in the covered condition. This is not true for the neutral pictures.

TABLE 4

.*P*-values	Visible	Covered	Visible	Covered
Stimulus type	**All pix p (rank)**	**All pix p (rank)**	**Checkerboard p (rank)**	**Checkerboard p (rank)**
All electrodes	***0.074 (962)***	0.35 (174)	0.78 (608)	0.63 (313)
Cz-mastoids	***0.01 (995)***	0.27 (134)	0.90 (447)	0.78 (391)
C3-mastoids	0.52 (742)	0.14 (71)	0.48 (756)	0.72(359)
C4-mastoids	0.21 (893)	0.19 (95)	0.44 (783)	0.98 (509)
Fz-mastoids	0.20 (899)	0.53 (265)	0.1 (949)	0.90 (448)
Pz-mastoids	0.33 (835)	0.38 (190)	0.24 (884)	0.58 (711)
Oz-mastoids	0.86 (520)	0.39 (196)	0.42 (785)	0.62 (688)
vertical EOG	0.14 (68)	0.06 (29)	***0.006 (3)***	0.89 (554)
Delta 1-4 Hz	***0.006 (3)***	0.51 (744)	0.16 (80)	***0.10 (952)***
Theta 4-8 Hz	0.64 (320)	0.15 (927)	0.94 (532)	0.06 (28)
Alpha 8-12 Hz	0.73 (367)	0.79 (605)	0.07 (35)	0.39 (196)
Beta112-20 Hz	0.47 (234)	0.37 (813)	0.73 (367)	0.90 (551)
Beta2 20-30 Hz	0.63 (317)	0.34 (831)	0.25 (126)	0.53 (266)
Gamma 30-40 Hz	0.42 (787)	0.59 (295)	***0.03 (15)***	0.82 (588)

The *p*-values for a two-tailed test of significance of the regression coefficients are calculated from the rankings mentioned in brackets behind. All values in italics are significant, those not in bold are significant at a 5% level only in a one-tailed test.

To obtain the significances for the regression coefficients displayed in Figure 3 a ranking statistic was performed leading to the *p*-values for a two-tailed test as Table 3 shows. The figure also shows the significances of the frequency analysis added post-hoc. The ranks as printed in brackets are regarded significant when being larger than 975 or smaller than 25. A highly significant shift of ranks of the Q' towards higher ranks was detected for the visible condition in the Cz channel (*p*=0.01) as well as for the delta band (*p*=0.006). A significant decrease of delta activity was discovered for visible checkerboard stimulation. The result for all electrodes merged was only significant in a one-tailed test (rank=962). In a two-tailed test, no significant shift of ranks can be observed. The vertical EOG is only significant in the checkerboard stimulation compared to solution 1.

Single subject analysis

For testing the influence of each participant on the result we focus on the overall significant ‘all electrodes’ channel in the condition “all pictures” and the combined rankings of the whole pre-stimulus interval (see Figure 4). A t-test for the average rankings being different from the expected mean of 500 resulted in $t(19)=2.24$ ($p<0.05$) for the visible stimulation. The ranks of the covered condition are not significantly different from 500. As Figure 4 illustrates for the visible condition, 9/20 participants showed an average rank in the top 25% of the scale and only one was in the bottom 25%. For the covered condition 9 participants were in the lower quarter and 6 in the top quarter of the scale which is more balanced and tends to an opposite behavior. 17/20 ranks were higher in the visible than in the covered condition.

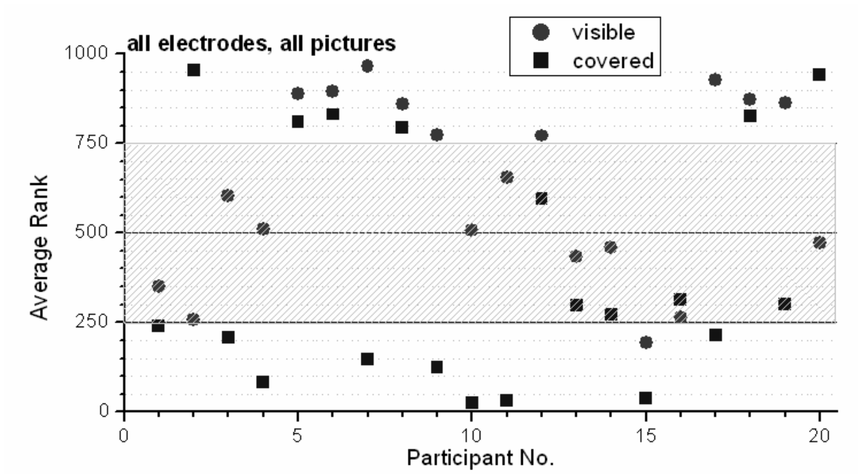

Figure 4 The average rank for each participant is shown for the ‘all electrodes’ channel and all pictures separately for the visible and covered stimulation.

DISCUSSION

Grand Average

The fact that the grand average as shown in Figure 1 could not reveal a visible presentiment response suggests that this effect, if relevant at all, is either not time locked to the stimulus or different for each participant. The results suggest the existence of an abnormal presentiment effect. As it is not visible in the averaged EEG curves as shown in Figure 1 this effect seems to be not time-locked to the stimulus and different for each participant. Its waveform is still not known.

It is certainly not easy to discover an effect of large magnitude which would be apparent without statistical analysis.

Statistical Results

Because of the high interdependence between electrodes a correction for multiple testing regarding different electrode positions was not applied as an over-correction would probably mask the effect.In order to circumvent the problem of the multiplicity of tests, we averaged all electrodes onto one channel. The analysis used a strictly non-parametric approach using distributions generated from each participant, hence maximising statistical power while minimising artefacts. Only through such an individualised, highly sensitive analysis were effects visible at all, suggesting that they are individual and potentially average out over the whole study. The effect seems to be stronger in the condition with affective pictures, hence affectivity of picture content seems to be an important factor, supporting results from previous studies (e.g., Bierman et al., 2000). Interestingly enough, high and negative *z*-scores in the EOG can be observed in all visible conditions, which suggests systematic blinking of participants at or after presentation of the stimulus as compared to before. As the interstimulus interval was of variable length determined by randomisation, it is not plausible to assume a learning process here. Rather an anticipation of visual material seems to have been picked up by the EOG, which was not the primary target of our analysis.

One point of criticism is that the stimuli were not completely unexpected. They occurred systematically after each 4 to 7 seconds. Therefore, the results could also be interpreted as a symptom of expectancy or anticipation. However, the clear effect only in the affective and not in the neutral condition does reject this possibility. An analysis of the slow potentials below 1 Hz revealed no significant effect. Therefore, the activation at Cz is not a preparative contingent negative variation (CNV, Walter et. al, 1964). In a next study the length of the inter-stimulus intervals could be varied from 3 to 15 seconds, for example to rule out any effect of expectancy.

The classical explanation for the effect at Cz as an artifact produced by incorrect EOG-compensation is not applicable, since then the effect should be negative as in the EOG channel and similar for both picture conditions. Also, the strong EOG blinking artifact should then be visible in the grand average. However, it is not. Thus we seem to have discovered a genuine presentiment effect here.

One explanation for the fact that merged electrodes show a smaller presentiment effect than many separate electrodes (see Table 3) is that the effect is partly averaged out in the merging process. The central, parietal and occipital significances suggest that the visual system could be involved in pre-stimulus responses of visual stimuli.

The single subject analysis shows that the significant effect was not created by a few participants only. It is an effect in most subjects, which exhibits a similar trend, while in the covered condition no such trend is visible.

Interpretation

The missing significances for neutral pictures and checkerboard stimuli suggest that emotional affectivity is important for a presentiment reaction in the EEG. This is in line with a study published by Bierman & Scholte (2000) who discovered the presentiment effect in BOLD (blood oxygen level dependent) response measured by fMRI. They also used affective and neutral picture stimuli and found a higher pre-stimulus effect in affective violent and erotic pictures than in neutral pictures. A biological interpretation would be that such a presentiment effect is a potential rudimentary warning system for imminent affectively salient stimuli, thus supporting the proposal that biological systems might have made use of non-classical effects to enhance their chances of survival (Josephson & Pallikari-Viras, 1991).

We observed a tendency towards compensatory behaviour of pre-stimulus activity (compare the visible and covered condition in Figure 3). This could be explained by the decision augmentation theory (DAT). A number of theories have been proposed to account for anomalous mental phenomena that seem to support ESP and Psychokinesis. DAT has been supported by a body of statistical studies (May and Spottiswoode 1995, May 2004) but also challenged according to a series of studies analysed by May et al 1995 and according to a survey by York H. Dobyns in 2000, having found the scales tipped in favour of an influence model. According to DAT, the researcher's or the subjects' psi ability enables them to unconsciously obtain information about the content of, say, a random process. This information then contributes to their choosing the time to initiate the data collection that will produce better correlations with the experimental target. However, when applied across a whole ensemble of data, no deviation from physical expectation values are observed, and no physical laws are violated. Applied to Presentiment research, a DAT model would substitute anomalous precognition on the part of the experimenter, when choosing starting points for experimental test series, for participant presentiment. Such an analysis would contradict the above mentioned suggestion that presentiment effects are biologically useful rudimentary warning systems. Along the lines of the DAT model, it is difficult to see why salient pictures should produce a stronger effect than neutral or checkerboard stimuli, except for the expectation of the experimenters. However, it is difficult to see how the experimenter's choice of starting the experiment could have triggered the whole fluctuation for a highly complex mix of randomized starting points, stimulus presentations, and inter-stimulus intervals as used in this experiment.

Systems theoretical models like the Model of Pragmatic Information (MPI; Lucadou 1995) or Weak Quantum Theory (WQT, Atmanspacher, Römer & Walach, 2002; Lucadou, Römer & Walach, 2006) would predict a meaningful deviation from randomness that transports meaning on an individual basis, which, however, would not necessarily be visible in a full ensemble of data. We observed no obvious effect in the grand average of all data, suggesting that any effect, if present at all, occurs on an individual basis. Please note that it was only by a highly complex, completely individualised and sensitive analysis that the presentiment effect reported here was discovered. Also, we can observe some compensatory behaviour of the system between stimulus and covered conditions (see above and Figure 3), suggesting some balancing of information between conditions.

One corollary of such systems theoretical approaches as the MPI and WQT is that the deviations of material systems or correlations between mental and physical systems are to be taken as correlations and not as causal signals, and that, if treated as causal signals, these correlations break down. We assume that an extremely complex experimental system such as EEG analysis of brain electrical signals in correspondence to a random pattern of stimulation observes at least some border conditions for potentially non-classical deviations from randomness to occur. An analysis along the lines of WQT would assume that individual states of a biological system are non-locally coupled over time. The theoretical preconditions for such coupling, complementarity between local and global observables, are realised by individual states (local observables) belonging to one global system (global observable), with individuality and connectedness being the complementary parts. (Another, more philosophical, analysis would emphasise the complementarity between process and substance, which can be reduced to the basic canonical variables of time and energy, see Römer (2006) for a more detailed analysis. Both ways of analysing the situation seem equivalent to us). Hence the theoretical analysis would lead us to expect non-local, temporal coupling between states of one system, both forward and backwards in time, which, however, must not be usable as signals, else the coupling collapses. A corollary of this statement would be that post-sentiment effects should also be obtainable from experimental data in paradigms like the one used by us and possibly by others, provided the post-stimulus epochs are technically symmetrical to the pre-stimulus epochs. Potentially, this might also be an elegant way of determining whether a DAT model or systems theoretical information-enhancement model such as MPI or WQT would be more adequate. This question will have to await further analysis of our own data set, and potentially the data of other experiments.

We believe that our experiment obeys theoretical boundary conditions of correlational, systems and offers theoretical models sufficiently robust to allow for replication. At least the analysis of single cases (cf. Figure 4) does not seem to imply a decline of the effect over time other than a sinusoidal oscillation. One way of testing this would be through experiments with randomly chosen numbers of participants. Since the sensitivity of our experiment derives mainly from the sensitivity of the single case statistics, strictly speaking, an experiment with more than one participant in a series of replications, and hence, experiments with more participants could explore the well known prediction of correlational systems theoretical models such as MPI and WQT of a decline effect under the condition that a signal can be distilled out of the results. Our analysis suggests that this is not the case in our experimental setting. Hence we would not expect a correlation of number of replications/number of participants with the size of the effect, neither positively in the sense of a signal theoretical increase in precision, nor negatively, in the sense of a decline effect.

To detect a totally non-time locked effect, an analysis method could be chosen which is not based on averaged waveforms but works on a single trial basis. Such a method would have to be developed. Meanwhile, we conclude from our data that presentiment effects can be discovered in EEG data of people about to be stimulated with affective visual material. This effect is unlikely to be understandable along the lines of an anomalous information transfer paradigm. Instead we have offered an interpretation that understands these effects as non-local coupling of individual states of one system over time. They do not seem to be time-locked, act on an individual basis, and are likely to be very small deviations from expected random fluctuations. Magnitude and impressiveness of effects, as seen in real-time and real-life situations of precognition, seem to be indirectly proportional to experimental reproducibility and stability. We hope to have presented a paradigm that fosters the latter at the expense of the former in order to produce better scientific understanding of such effects.

As a conclusion, we could state from the perspective of this analysis that affective slides seem to show a pre-stimulus response in the second before presentation when compared to the presentation of neutral pictures. The non-significant results when covering the monitor can be seen as a proof of the validity of the analysis method.

ACKNOWLEDGEMENT

This experiment was supported by a grant from the Samueli Institute (www.siib.org). Colette Haverty-Stacke is supported by a PhD bursary from the School of Social Sciences at the University of Northampton.

REFERENCES

Atmanspacher, H., Römer, H., & Walach, H. (2002). Weak quantum theory: Complementarity and entanglement in physics and beyond. *Foundations of Physics, 32*, 379-406.

Bierman, D.J. & Radin, D.I. (1997). Anomalous anticipatory response on randomized future conditions. *Perceptual and Motor Skills*, *84*, 689-690.

Bierman, D. J. & Radin, D. I. (1998). Conscious and anomalous non-conscious emotional processes: A reversal of the arrow of time? *Toward a Science of Consciousness, Tucson III*. MIT Press, 1999, 367-386

Bierman, D. J. & Scholte, H. S. (2000). Anomalous anticipatory brain activation preceding exposure of emotional and neutral pictures. *Journal of Parapsychology, 64 (3*), pp.239 ff.

Broughton, R. (2004). Exploring the reliability of the 'presentiment effect'. *Proceedings of Presented Papers. The 47th Annual Convention of the Parapsychological Association*, 15-26.

Dobyns, Y. H (2000). Overview of several theoretical models on PEAR data. *Journal of Scientific Exploration 14*(2) 167-194.

Hartwell, J.W. (1978) Contingent negative variation as an index of precognitive information. *European Journal of parapsychology, 2*, 83-103.

Hinterberger, T., Wilhelm, B., Mellinger, J., Kotchoubey, B., and Birbaumer, N. (2005), A Device for the Detection of Cognitive Brain Functions in Completely Paralyzed or Unresponsive Patients. *IEEE Transactions. on Biomedical Engineering, 52*(2), 211-220.

Hinterberger, T., Mellinger, J., and Birbaumer, N. (2003), The Thought Translation Device: Structure of a multimodal brain-computer communication system. *Proceedings of the 1st International IEEE EMBS Conference on Neural Engineering*, Capri Island, Italy, March 20-22, 603-606.

Josephson, B. D., & Pallikari-Viras, F. (1991). Biological utilization of quantum nonlocality..*Foundations of Physics, 21*, 197-207.

Lucadou, W. V. (1995). The model of pragmatic information (MPI). *European Journal of Parapsychology, 11*, 58-75.

Lucadou, W. v., Römer, H., & Walach, H. (2006). Synchronistic Phenomena as Entanglement Correlations in Generalized Quantum Theory. *unpublished manuscript*.

May, (2004). Anticipatory skin-conductance responses: A possible example of decision augmentation theory. *Proceedings of Presented Papers. The 47th Annual Convention of the Parapsychological Association*, 113-120.

May, E. C., J. M. Utts, S. J. P. Spottiswoode and C. J. James (1995). Applications of decision augmentation theory. *Journal of Parapsychology*, 59(3), 221-250.

May, E. C., Utts, J. M., & Spottiswoode, S. J. P. (1995). Decision augmentation theory: Toward a model for anomalous mental phenomena. *Journal of Parapsychology*, *59*, 195-220.

Radin, Dean L. (1997). Unconscious perception of future emotions: an experiment in presentiment. *Journal of Scientific Exploration, 11*(2), 163-180.

Römer, H. (2006). Complementarity of substance and process. *Mind and Matter, submitted.*

Vassy Z. (1978). Method of measuring the probability of 1-bit extrasensory information transfer between living organisms. *Journal of Parapsychology*, *43*(2), 158-160.

Wackermann, J., Seiter, C., Keibel, H. & Walach, H. (2003). Correlations between brain electrical activities of two spatially separated human subjects. *Neuroscience Letters, 336*, 60-64.

Wackermann, J., Muradas, J.R.N. & Puetz, P. (2004). Event-related correlations between brain electrical activities of separated human subjects: preliminary results of a replication study, *Proceedings of presented papers. The 47th Annual Convention of the Parapsychological Association*, 465-468.

Walter, W.G., Cooper, R., Aldridge, V.J., McCallum, W.C., & Winter, A.L. (1964). Contingent negative variation: An electric sign of sensorimotor association and expectancy in the human brain. *Nature*, *203*, 380-384.

EXPERIMENTER EFFECTS AND VOLITIONAL STRATEGIES IN THE MIND-MACHINE INTERACTION REPLICATION

Joop M. Houtkooper
Center for Psychobiology and Behavioral Medicine
Justus Liebig University of Giessen
Otto-Behaghel-Strasse 10, 35394 Giessen, Germany
email: joophoutkooper@gmail.com

ABSTRACT

Volitional strategies in PK experiments have been reported by early experimenters acting as their own subjects. A study by Gissurarson, in which he obtained volitional strategies from the participants after the PK task, put this on a broader basis. In the present experiment, part of the Mind Machine Interaction (MMI) replication study, 74 subjects participated, contributing a total of 271 sessions. In the PK task, volitional strategies have been freely chosen by the participants before starting each run. The preliminary findings of this study confirmed Gissurarson's finding, that the "resonance" strategy was associated with the best PK performance. This strategy is also linked to subjective reports of "effortless effort" as a psi-conducive state of mind. In the present paper, the differences between the experimenters in the same study are analyzed. Apart from the interest in experimenter effects per se, this is relevant for the expected reproducibility of the findings. The finding of the resonance strategy turns out to be less robust, than the earier report suggested. However, major differences, specific to individual experimenters have been found. These differences are particularly striking for the "confidence" volitional strategy, where one experimenter obtained highly significant psi-hitting (p-2t<.002), whereas the other two experimenters both obtained significant psi-missing (*p*-2t<.02 and <.003). The interaction effect between experimenters and volitional strategies on PK-scoring is highly significant (*p*=.000024). Comparison of analyses by run and by session provides evidence that PK performance varies on a time-scale of minutes, dependent on the consciously chosen volitional strategy, but also dependent on the person of the experimenter.

INTRODUCTION

Quite often in PK experiments, the participants are naive with regard to explicit PK tasks. So it might be surprising that almost everybody, when asked to mentally influence a random process, sits down without much ado and does something. However, this may signify that people are used to mental efforts to influence events in ordinary life. For instance, they wish that an accidentally falling teacup survives hitting the floor. Nevertheless, the question remains: What do people do when a mental influence is called for? Even if they do individually very different things, what do they do and what brain states might correspond with these different modes of mental effort?

The present study is concerned with part of the second question, that is, what "volitional strategies" are employed by participants in a PK experiment. About the description of beneficial psychological conditions in a PK experiment, the early experimenters, who often acted as their own subjects, have reported some introspective and anecdotal material. For instance, Thouless (1951) and Forwald (1952, 1969) have been such experimenters. In this tradition, of the experimenters taking part in their own experiments, also belongs the Princeton Engineering Anomalies Research (PEAR) group (Jahn & Dunne, 1987, p.142). Of particular interest is a common element in these different descriptions of a successful volitional strategy, namely that there is a state of mind, described as "effortless effort" or "resonance" with the apparatus, which is associated with success in a PK task.

There have been other indications, that being relaxed works better than intense striving for an effect. Stanford (1977) has reviewed a broader range of psychological factors which might be associated with success in PK experiments, while Irwin (1985, 2004) more specifically has discussed states of consciousness associated with success in PK tasks, pointing to an unforced state of absorption in the goal of the task facilitating PK performance. Consistent with these reports is a study by Schmidt (1997) in which he observed psi-missing under a variety of stressful circumstances.

Another view on successful PK might be gleaned from the spontaneous cases, such as those described by Irwin (2004, p.114) and the poltergeist cases, in which PK occurs without conscious effort.

A systematic approach to volitional strategies has been Gissurarson's (1997) study. He interviewed his participants after the PK session about their mental efforts. A result was an inventory of volitional strategies and their associated PK performance. The most successful strategy has indeed been one described as "resonance". Gissurarson adds the following description of resonance: *"immersion in the process to the point of some loss of awareness. Perhaps closely related here is the descriptive concept of effortless effort -- in that the subject avoids attempting direct influence over the device yet he or she wants the device to produce certain results"*. Gissurarson's inventory of volitional strategies was the source for the choice of strategies in the present experiment. An important methodological difference with Gissurarson's study is that the present experiment concerns the prospective effect of volitional strategies: Instead of being interviewed after the session, in the present study the participants chose a volitional strategy for the PK run that they started immediately afterward.

The experiment was carried out as Phase 2 of the Giessen part of the multicenter PEAR/IGPP Mind Machine Interaction (MMI) replication study. The MMI replication study has been reported extensively with regard to Phase 1, in which 250 experimental sessions were carried out in each of the three laboratories, in Princeton, Freiburg and Giessen (Jahn et al., 2000). The overall results of this study have been, first, the expected scoring level falling short of significance, and second, definite indications of scoring patterns in the data, which unfortunately had not been predicted. Both in Freiburg and Giessen a second phase of similar size has been conducted. The reason to use the term "mind machine interaction" has been that when the participants may choose the target or intention of a run, a positive outcome could be produced by precognition as well as by PK. However, the theoretical - not the psychological - distinction between these processes may be a moot point (Houtkooper, 2002). Nevertheless, the experiment was presented to the participants primarily as a PK task.

The present study, Phase 2 of the MMI replication in Giessen, included the study of volitional strategies. Scoring patterns were observed in the Giessen data, as has been reported earlier (Houtkooper, 2000, 2004). To give two examples of findings for the combined phases in Giessen, PK scoring increased significantly from participants' first session to the second ($z = 2.322$, $p = .02$, two-tailed) and secondly, within sessions a U-shape, or salience, scoring pattern was observed ($z = 2.349$, $p < .02$, two-tailed). Although these post hoc findings may be not too impressive with regard to the effect sizes involved, they were considered as indications for the presence of a PK effect in the data. Therefore, it is all the more interesting to see whether different volitional strategies result in differences in scoring.

The findings, reported at the 2004 PA convention (Houtkooper, 2004), may be summarized as follows: The study involved 74 participants who took part in 271 PK (or MMI-) sessions of about an hour. The overall PK scoring was in the intended direction, that is, the difference of the RNG output between "High" and "Low" intentions was positive, but it fell short of significance ($p=.24$).

The participants recorded their volitional strategy before each PK-run, from a list of 5 choices, namely "Imagery", "Relaxed", "Confidence", "Resonance" and "Guessing", as well as the option to employ their own strategy. The consensus in the literature, that a strategy involving "effortless effort" or "resonance", would be the most successful, could be confirmed ($p=.03$).

Furthermore, it appears that the choice of a volitional strategy is related to several psychological variables. Participants who rated themselves high on Luckiness, chose more often the resonance strategy or their own strategy. They obtained also significant above chance PK scores on runs in which they used the resonance strategy ($p<.03$), or their own strategies ($p<.03$). On the other hand, those with a high ability to visualize chose less often their own strategy, but scored significantly on those runs ($p<.01$). Participants who scored high on the Conscientiousness scale of the NEO-FFI chose the resonance strategy less often, but scored very significantly ($p<.001$) on the runs in which the resonance strategy was employed.

An item in the questionnaire relevant for absorption showed a positive correlation with the preference for the resonance strategy. Therefore, choosing the resonance strategy more often in the experiment is related to generally being more absorbed.

As long as certain findings are the result of the efforts of a single experimenter, the question of experimenter differences cannot be answered. However, the existence of both psychological and parapsychological experimenter effects is well documented (Kennedy and Taddonio, 1976; White, 1976a, b, 1977; Smith, 2003). Therefore it was a lucky circumstance that the present experiment was conducted by three experimenters, the author and two student assistants. The study of the differences between the experimenters in this study is a post hoc analysis. Nevertheless, the analysis of these differences, with regard to the prevalence of experimental conditions, the prevalence of volitional strategies and the PK scoring while employing different volitional strategies is of interest for the question of the reproducibility of the overall findings. Moreover, experimenter effects are of interest in their own right and may shed some light of the psychological factors that play a role in successful PK-scoring.

METHODS

Software and hardware

The experiment was carried out using the computer software of the multi-center PEAR/IGPP study (Jahn et al., 2000), the PortREG computer program, run on a PC. The random number generator (RNG) used was the PEAR benchmark electronic Random Event Generator. This generator resulted in one 200-bit sample, or trial, being registered in a little less than one second. A short run, consisting of 100 trials, lasts about 85 seconds, while a long, 1000-trial run lasts almost 15 minutes. The PortREG program enabled the choice between sessions of 30 short runs or 3 long runs. (In the following, where "run-score" is used, it means score of a 100-trial section. Long runs were for analysis divided into 10 such sections.) Runs were balanced among the three different intentions, namely "High", "Low", or "Baseline" (in the following called H-, L- and B-runs, respectively). Furthermore the participant had the option of chosing the intention, or target direction, of each run him- or herself, or having the choice of intention made by the computer, using a pseudo-random algorithm, with a starting point derived from the computer clock, so that the sequence of intentions was different in each session. The pseudo-random algorithm produced a "well-shuffled closed deck" of the 30 intentions. Another option was the feedback mode of the random process. The standard condition of graphic feedback resulted in a graph depicting the cumulative deviation from chance expectancy from the beginning of the run, at the left edge of the screen, to the right edge of the screen at the end. The vertical deviation was proportional to the deviation from chance, so that a trial which consisted of 100 0's and 100 1's produced a horizontal stroke; if there were more than 100 1's the slope was upward, with more than 100 0's the slope was downward. This cumulative graph was colored red (on a black background) if the assigned intention, or target direction, was "High", blue if the intention was "Low" and green if it was "Baseline".

Presentation

The first session by each participant (Pt) employed the standard condition of graphic feedback, short runs and choice of intention by the Pt. In later sessions, the Pt could choose another condition freely. After the condition for the session had been chosen and put in by the experimenter, the experimenter left the Pt alone for the rest of the session. At the end of the session, the overall score of the session and any particular experiences of the Pt was discussed with the experimenter.

Experimenters

The experimenters in this study were the author (male, 56 years old) in about half of the sessions, a 24-year old female student assistant for a about a third and the remaining roughly one sixth of the sessions were conducted by a 33-year old male student assistant. Henceforth they will be indicated as E1, E2 and E3, respectively. The student assistants had taken part in Phase 1 of the Mind-machine Interaction

Replication, so they were familiar with the PK-task and its different experimental conditions. Moreover they were instructed extensively about the volitional strategies, so that it might be surmised that the differences between conditions as regards the experimenters were minimized.

Volitional strategies

First of all, the Pt was given an instruction by the experimenter about the 'willing' or 'wishing' he or she was going to do, and that people in earlier experiments had given their subjective impressions. The Pt was asked to keep a record of his or her performance on a form which has columns for intention and volitional strategy, both to be filled out before the run started, and the mean score of the run, which was a number around 100, and an optional column for comments. The volitional strategies to choose from were given as:

A: Imagery
B: Relaxed
C: Confident
D: Resonance
E: Guessing
X: Other, please describe your own strategy.

The text of the instruction was also given to the Pt in writing, see Appendix 1. The above choice of strategies was made, based on the most successful strategies in Gissurarson's study, as will be discussed later. It was emphasized that Pts were free to choose for each run the strategy they liked best. It was deemed important to leave the protocol rather flexible, as a study of protocol-rigidity has indicated (Schneider, 1999). The volitional strategies were recorded by means of a protocol.

Participants

In Phase 2 of the MMI-replication the participants (Pts) were recruited by advertisements in a local newspaper, for an ESP experiment. One session was conducted, consisting of filling out a questionnaire and a 40-trial, forced-choice ESP test. The questionnaire has been described earlier (Houtkooper, 2003). The 88 participants in this ESP experiment were invited to take part in the MMI experiment: 26 males and 48 females volunteered. Their ages ranged from 19-60, while the mean age was 29 years (SD=8.1) with a median of 26.4 years. Per session, which typically lasted about an hour, the participants were rewarded with 15 DM or about 8 Euros.

Data collection

Data were collected from January to October 1999. The number of sessions per Pt was voluntary, up to 5. The 74 participants in the MMI experiment took part in a minimum of one session, the mean number of sessions being 3.66, for a total of 271 sessions. Volitional strategies were recorded appropriately, with very little missing data (less than 1% of the runs). Some Pts recorded volitional strategies also for the baseline runs, but this had little meaning for this study.

Analysis

The hypothesis for the present study was that the runs in which the Pt chose the "resonance" strategy, would produce the best PK performance. In order to avoid confusion with a salience effect, this strategy was not put at the beginning or the end of the list, but rather in the middle (see Appendix 1). Student's t-test is applicable in overall and single experimenter analyses. Comparing experimenters has been done by ANOVA's, using the Multivariate General Linear Hypothesis procedure of the SYSTAT statistical package (Wilkinson, 1990). This procedure uses a least squares algorithm that is also suitable for unbalanced designs.

RESULTS

The reason for the present analysis was that a cursory examination revealed differences in PK-scoring between the sessions conducted by different experimenters in this study. Two-sample t-tests between the run-scores of H- and L-runs revealed for experimenter E1 a t-score of $t=+1.14$ ($df=2698$, $p(2\text{-}t)=.25$), for E2 $t=-1.46$ ($df=2098$, $p(2\text{-}t)=.14$) and for E3 $t=+2.42$ ($df=618$, $p(2\text{-}t)=.016$). These results suggest a significant variance between experimenters, and this was confirmed by a one-way ANOVA ($F(2,5377)=4.29$, $p=.014$). As this result might be regarded as the catch of a wide-ranging fishing expedition, we might take it with a grain of salt, Bonferroni-wise. This might be taken for granted, but nevertheless there is good reason to explore further differences between the experimenters.

Although PK-scores are the main interest, the fact that the design of this study implied a free choice by the Pt of experimental conditions and volitional strategies, results in concomitant variables, characterizing the behaviour of the Pt. As this behaviour is influenced by a psychological experimentator effect, these can be analyzed, which would not be possible in a rigid design in which conditions and strategies are proscribed.

Experimenter differences in participants' characteristics and experimental conditions

First of all, the Pt's characteristics did not differ between experimenters, in particular age and gender distributions were quite similar. This despite the differences in gender and age between the experimenters themselves.

The choice of experimental conditions, namely feedback mode (graphic, digital, or no feedback during the run), runlength, and choice of intention or target direction (namely instructed or volitional) were analyzed for the sessions of each experimenter. As the conditions in the first session were standard, short runlength, graphic feedback and volitional choice of intention, only the results of the second and later session are given in Table 1.

TABLE 1 EXPERIMENTAL CONDITIONS IN THE SECOND AND LATER SESSIONS PER PARTICIPANT FOR THE THREE EXPERIMENTERS, AS PERCENTAGES OF THE TOTAL NUMBER OF SESSIONS.

Category	Condition	E1	E2	E3	Overall
Runlength	Short	73	36	71	58
	Long	27	64	29	42
Feedback	Graphic	68	79	79	74
	Digital	25	13	17	19
	"No"	7	8	4	7
Assignment of	Volitional	67	97	71	79
Intention	Instructed	33	3	29	21
Number of sessions		97	76	24	197

The striking differences - note the choice of long runlengths and instructed assignment of intention with experimenter E2 - will be discussed later. Here, I note that the choice of experimental condition took place at the start of the session and was put in by the experimenter, in conversation with the Pt.

Experimenter differences in volitional strategies

The choice of a volitional strategy was made in the course of the session before each run by the Pt and noted by him or her in the protocol. The differences between experimenters with regard to the choices by the Pts are shown in Table 2:

TABLE 2. VOLITIONAL STRATEGIES: PREVALENCES IN ALL RUNS FOR THE THREE EXPERIMENTERS, AS PERCENTAGES OF TOTAL NUMBER OF RUNS (100-TRIAL SECTIONS).

Volitional strategy	E1	E2	E3	Overall
A: Imagery	26	28	51	30
B: Relaxed	20	15	17	18
C: Confidence	19	13	9	16
D: Resonance	10	10	17	11
E: Guessing	13	20	4	15
X: Own strategy	9	13	2	10
Missing	1	1	0	1
Total number of runs	2700	2100	620	5420

Also with regard to volitional strategies, the differences between experimenters are notable, especially the runs with E3 as an experimenter reveal a pattern, different from the other two experimenters.

Experimenter differences in PK-scores with different volitional strategies

In view of the experimenter differences in overall PK-scoring, it is of interest to see how different strategies differ with regard to PK-scoring among experimenters. PK-scoring can be characterized in different ways: First as an effect size, or shift in the probabilities. Secondly, the significance of the PK-scores, as a small number of runs with a large effect size may fall short of significance. It should then rather be interpreted as a chance occurrence, whereas a relatively small effect size can be significant and therefore rather be due to a real effect. Because the numbers of runs per experimenter and per strategy are so widely different, this calls for two different tables, which could be read in parallel. First, I present the effect sizes as mean shift of the run-score. The run-score is the total number of 1-bits per 100-trial section, of which the expected number of 1-bits is 10000. The mean shift is the difference between the mean scores of the H-runs and the L-runs. The mean shifts of the run-scores are given in Table 3a.

TABLE 3A PK-SCORING: MEAN SHIFTS BETWEEN H- AND L-RUNS OF THE NUMBER OF 1-BITS, PER STRATEGY AND PER EXPERIMENTER. (BETWEEN PARENTHESES THE NUMBERS OF RUNS)

Volitional strategy	E1	E2	E3	Overall
A: Imagery	-1.8 (715)	-9.8 (581)	+13.3 (315)	-1.7 (1611)
B: Relaxed	-7.8 (538)	+6.0 (325)	+25.2 (106)	+0.5 (969)
C: Confidence	+19.4 (513)	-20.4 (283)	-55.4 (58)	+1.1 (812)
D: Resonance	+2.7 (275)	+13.5 (200)	+35.1 (104)	+11.5 (579)
E: Guessing	-2.0 (364)	-0.7 (424)	+62.7 (24)	+0.6 (812)
X: Own strategy	+20.6 (267)	-4.6 (276)	-22.4 (13)	+7.0 (556)
Overall	+3.2 (2700)	-4.5 (2100)	+13.6 (620)	+1.4 (5420)

TABLE 3B: PK-SCORING: MEAN SHIFTS BETWEEN H- AND L-RUNS OF THE NUMBER OF 1-BITS, PER STRATEGY AND PER EXPERIMENTER: T-TEST AND TWO-TAILED PROBABILITIES.

Volitional strategy	E1	E2	E3	Overall
A: Imagery	-0.33 p=.74	-1.73 p=.085	+1.68 p=.094	-0.50 p=.62
B: Relaxed	-1.32 p=.19	+0.74 p=.46	+2.06 p=.042	+0.11 p=.91
C: Confidence	+3.13 p=.0018	-2.46 p=.014	-3.12 p=.0029	+0.23 p=.82
D: Resonance	+0.31 p=.76	+1.29 p=.20	+2.32 p=.022	+1.89 p=.059
E: Guessing	-0.26 p=.80	-0.10 p=.92	+2.34 p=.029	+0.12 p=.91
X: Own strategy	+2.08 p=.039	-0.54 p=.59	-0.66 p=.52	+1.09 p=.28
Overall	+1.14 p=.26	-1.46 p=.14	+2.42 p=.016	+0.71 p=.48

In Table 3b the corresponding Student's t-scores and two-tailed probabilities are presented. Table 3b displays several combinations of experimenter and volitional strategy that are highly significant. An overall significance test of the interaction between these variables may be obtained by an ANOVA. This ANOVA is presented in Table 4. Note that the ANOVA is in principle a three-way ANOVA with the factors Intention, Experimenter and Volitional Strategy. The main effect of Intention represents the overall PK-effect, which is not significant (p = .28). The differences between experimenters are expressed as the interaction between Intention and Experimenter (p=.12), while the differences between volitional strategies are expressed as the interaction between Intention and Volitional Strategy, which is significant (p=.0034). As only the interactions with Intention are meaningful to PK-performance, the single factors of Experimenter and Volitional Strategy have been left out.

TABLE 4: PK-SCORING: ANOVA ON THE NUMBER OF 1-BITS PER RUN, WITH AS INDEPENDENT VARIABLES INTENTION OR TARGET DIRECTION, EXPERIMENTER AND VOLITIONAL STRATEGY.

Source	Sum-of-squares	df	Mean-square	F-ratio	*p*
Intention	5906	1	5906	1.1625	.28
Intention * Experimenter	21661	2	10831	2.1319	.12
Intention * Vol.Strategy	89954	5	17991	3.5412	.0034
Intention * Experimenter * Vol.Strategy	199325	10	19933	3.9234	.000024
Error	27241170	5362	5080		

The ANOVA results from an unbalanced data set. This means that the partitioning of variance may slightly differ from a one-way ANOVA with only one of the factors. This is what apparently happens with Intention*Experimenter interaction, which was significant in a one-way ANOVA, as mentioned above. In contrast, the Intention*Volitional Strategy interaction is now highly significant, which is not the case in a one-way analysis (not presented here, but the total effects per strategy in Table 3 indicate this).

The three-way interaction between Intention, Experimenter and Volitional Strategy highly significant (p=.000024). This means that the effect of Volitional Strategy depends on the experimenter. From Table 3b it is clear that this is for a large part due to Strategy C, which results in a highly significant positive effect with E1, but with significant negative effects with both E2 and E3.

Exploration of determinants of PK-performance:

An important question in the study of PK is to what extent PK performance is determined by, on the one hand, a "PK ability", that is, a trait which manifests itself more or less reliably. On the other hand, PK performance might be more determined by momentary factors, like mood which may change from one moment to another. Furthermore, this momentary state of mind might be influenced by conscious effort or decision.

In order to shed light on these questions, I present two more analyses of variance. The first is similar to the one in Table 4, but only for the sessions with short runs. The second is an ANOVA, not on scores per run, but on the overall scores per session, consisting of 10 H- and 10 L-runs. The mean shift between H- and L-runs constitute the PK-scores. The factors to be analyzed in that case are the experimenters. Per session the prevalences of the different strategies are numbers from zero to maximum 20. However, these number add up to 20, so that there are for six strategies only five independent numbers. This is the reason to leave out Strategy A. The prevalences of the other five strategies are included in the analysis as covariates. The anaysis is therefore an analysis of covariance, with one categorical factor and five covariates.

The reason to leave out the sessions with long runs in these analyses is that the long runs are represented as 10 100-trial sections or "runs". The prevalences of the strategies in a session with long runs are therefore 0, 10 or 20 and this is a quite extreme distribution compared with the sessions with short runs. In sessions with short runs, the Pt can choose the same strategy for all 20 runs, but one rarely does so. Therefore, the sessions with long runs are excluded, because their higher variability in prevalences would overshadow the sessions with short runs. Leaving out the 82 sessions with long runs, the analysis of the run-scores of the 189 sessions with short runs is given in Table 5.

TABLE 5: PK-SCORING IN THE SHORT RUNS: ANOVA ON THE NUMBER OF 1-BITS PER RUN, WITH AS INDEPENDENT VARIABLES INTENTION OR TARGET DIRECTION, EXPERIMENTER AND VOLITIONAL STRATEGY.

Source	Sum-of-squares	df	Mean-square	F-ratio	*p*
Intention	6675	1	6675	1.2868	.26
Intention * Experimenter	28847	2	14424	2.7804	.062
Intention * Vol.Strategy	91614	5	18323	3.5320	.0035
Intention * Experimenter * Vol.Strategy	166427	10	16643	3.2081	.00040
Error	19360389	3732	5188		

The conclusions from Table 5 do not differ from those from Table 4, despite leaving out about 30 percent of the data. The lesser significances are what might be expected.

However, if the same data as in Table 5 are analyzed PK performance per session, we have to use the prevalences of the different strategies as dependent variables, and because of these are numerical rather than categorical variables, as covariates. (Because of multicollinearity the prevalence of Strategy A had to be left out.) This analysis of covariance on the PK-scores per session is presented in Table 6.

TABLE 6: PK-SCORING IN THE 189 SESSIONS WITH SHORT RUNS: ANCOVA ON THE MEAN SHIFT (HIGH-LOW DIFFERENCE) PER SESSION, WITH AS INDEPENDENT VARIABLE EXPERIMENTER AND AS COVARIATES THE PREVALENCES IN THE SESSION OF VOLITIONAL STRATEGIES B, C, D, E AND X.

Source	Sum-of-squares	df	Mean-square	F-ratio	*p*
Experimenter	29.872	2	14.936	1.664	.19
Strategy B	4.237	1	4.237	0.472	.49
Strategy C	0.726	1	0.726	0.081	.78
Strategy D	1.795	1	1.795	0.200	.66
Strategy E	17.989	1	17.989	2.004	.16
Strategy X	0.009	1	0.009	0.001	.97
Strategies combined	24.757	5	4.951	0.552	.74
Experimenter*B	10.491	2	5.246	0.584	.78
Experimenter*C	21.804	2	10.902	1.214	.30
Experimenter*D	12.367	2	6.184	0.689	.50
Experimenter*E	6.598	2	3.299	0.367	.69
Experimenter*X	50.652	2	25.326	2.821	.062
Experimenter * Vol.Strategies	101.913	10	10.191	1.135	.34
Error	19360389	3732	5188		

Remarkably, as shown in Table 6, the session scores are not dependent on the volitional strategies and also their interactions with the experimenter have disappeared. The experimenter effect is in both Tables 5 and 6 nonsignificant (p=.26 and p=.19, respectively). The effect of volitional strategy is in Table 5 represented by the Intention*Vol.Strategy interaction, which is significant with p=.0035, whereas in Table 6 the combined effect of volitional strategies is represented by the Strategies combined row, resulting a nonsignificant effect with p=.74. Moreover, also the interaction effect of experimenter and volitional strategy on PK-scoring is in Table 5 represented, on a per run basis, by the three-way interaction Intention * Experimenter * Volitional Strategy, with a highly significant p=.00040, whereas in Table 6 the corresponding analysis, on a per session basis, attains a nonsignificant p=.34. Therefore, on a per run basis effects occur which are completely obscured in a per session analysis of the same data.

GENERAL DISCUSSION

The present study, to analyze findings of the Mind-Machine Interaction Giessen Phase 2 data for experimenter effects, is exploratory. The reason to present this analysis it is that experimenter effects play a teasing role in parapsychological research: On the one hand, their presence makes process-oriented research difficult, because the reproducibility of any finding is open for doubt. Moreover, subtle changes in the attitude of the experimenter may well cause failure of replications. On the other hand, the subtle factors at work between the experimenter and the participant in the experiment may be elucidated by the very non-replication of an interesting finding. In the present case, the use of volitional strategies in a PK experiment and their apparent role, as demonstrated in the previous paper (Houtkooper, 2004), is the subject of study.

The unplanned nature of employing three different experimenters in the experiment means that any of the findings presented here have only exploratory status. However, the conclusions that may be drawn from these are of sufficient interest for the design of future psi experiments to deserve closer scrutiny.

The conclusions of the previous paper were, first, that the hypothesis that the volitional strategy described as "a feeling of resonance with the RNG or the computer", see Appendix 1, would be most successful, was confirmed. The history of this hypothesis goes back to early PK experiments with dice and has been given in the introduction. Secondly, it was found that psychological variables interact with the choice of a volitional strategy. Self-perceived luckiness and the conscientiousness scale of the NEO-FFI (Costa & McCrae, 1992) were examples. The same variables interacted with PK-scoring. Again, the interactions with the resonance strategy appeared to be the most pronounced. Thirdly, the choice of the resonance strategy appeared to be positively correlated with the Pt's ability to be absorbed. Finally, the interaction pattern with conscientiousness appeared to be associated with the momentary choice of the resonance strategy and not with the general tendency to choose resonance.

As a cursory examination of the overall scoring between experimenters revealed significant differences, a one-way ANOVA resulting in p=.014. This made a further scrutiny about the stability of the performance of the resonance strategy a must. The stability and replicability of findings in parapsychology is always of concern. To exclude one source of the experimenter differences, a check was made on possible differences between the Pts handled by the different experimenters: this revealed no significant differences on biographical and psychological variables of the Pts between experimenters.

The differences between experimenters in this study depend of course on who these experimenters were: For myself, E1, with a long history of PK research, the inclusion of volitional strategies in the present experiment was an opportunity to add a novel hypothesis to an otherwise routine second replication attempt of the PEAR findings, the first of which had failed with regard to its main purpose (Jahn et al., 2000). E2 and E3 were at the time both psychology students, in the course of obtaining their Master's degrees. Both had first taken part in my seminar on "anomalous phenomena" and had subsequently assisted me, and had been paid for it, in various tasks in connection with my research and both had worked for me in a very dedicated and reliable manner and both were seriously interested in parapsychological research. The difference between them was that E2 had a regular school career behind her, wheras E3 was somwhat older and had worked in various jobs before starting his study and he is a serious amateur pianist. Therefore, the experimenters were not a random sample from the population. This makes the replication of the present findings - an adventure. This has to be kept in mind when drawing conclusions.

The findings with regard to experimenter differences first pertained to the experimental conditions. Despite a great deal of instruction to make the instruction standardized, the differences in Table 1 has to be ascribed to preferences or habits of the experimenters. The experimental conditions of a session were determined at the start of the session, with the experimenter present. He or she suggested some possibilities, but the very fact of having a flexible protocol enables the experimenter to emphasize what condition he or she feels comfortable with. In the previous paper (Houtkooper, 2004) I elaborated on the advantages of a flexible protocol, which was also the subject of E2's Master's thesis (Schneider, 1999).

The choice of a volitional strategy is less obviously subject to the suggestive influence by the experimenter and within the 20 runs of the first session there is ample room for the Pt to try some strategies out. As strategies can be freely chosen, the influence of the experimenter should be less. In Table 2 the prevalences of the volitional strategies are given. Striking differences in this Table can be listed by experimenter or by strategy.

By experimenter, it is obvious that with E3 two strategies are relatively often chosen, namely A (imagery) and D (resonance), whereas strategies C (confidence), E (guessing) and X (Pt's own strategy) have a relatively low prevalence. The low prevalence for X means that E3's Pts were rather satisfied to choose from the five given descriptions. Guessing could be seen as PK-avoidance, namely by choosing the intention of the run (using precognition) achieve a success. Both E and X could be seen as indicators of a slightly negative attitude towards the PK-task. As E2 has highest prevalences for E and X and E3 for both the lowest, this fits with the overall scoring direction in the sessions by both experimenters: E2 got some missing, E3 significant psi-hitting.

Looking at Tables 2 and 3 from the point of view of individual strategies, D (resonance) produced overall psi-hitting (in Table 3b, the 2-tailed p-values are given, but the resonance hypothesis was one-tailed, so that the one-tailed p-value is .03) quite evenly divided between the experimenters. E1, who was clearly motivated to achieve success, contributed least to it, E3 the most. Strategy C (confidence) shows the most striking pattern: While E1 gets significant psi-hitting with this strategy (p=.0018, two-tailed), both E2 and E3 get significant psi-missing (p=.014 and p=.0029, respectively). This pattern is concomitant with the prevalences of strategy C: it is chosen in 19 percent of the runs with E1 and 13 and 9 percent with E2 and E3, respectively. Perhaps the Pts are learning to choose successfully which strategy works best for them.

This pattern with strategy C provides a large contribution to the overall significance of the influence on PK-scores by the interaction between strategy and experimenter. The ANOVA on the run-scores in Table 4 reveals a highly significant effect with p=.000024 or a probability of less than one in 40000. Also in Table 4, the effect of volitional strategy, irrespective of experimenter, is significant (p=.0034). This is more significant than it seems from the overall significances of the individual strategies in the last column of Table 3b, but this is a legitimate result when using an unbalanced design. The unbalanced design in turn is the result of unequal cell frequencies, caused by the flexible protocol in this experiment.

From the previous analysis it was suggested that the choice of the resonance strategy in the case of the individual run was determining the result, rather than the general preference of a subject for the resonance strategy. In the present analysis this phenomenon can be put on a more secure footing: The Tables 5 and 6 analyze the same effects, namely the effect on PK-scoring by first, the experimenter, second, the volitional strategy and, third, the interaction between these two factors. The difference between the two analyses is that in Table 5 the PK-scores are the scores per individual run, analzed in terms of the strategy chosen for that run, whereas in Table 6 PK-scores are the mean scores per session, which are analyzed in terms of the prevalences of strategies during the session. The use of categorical factors and covariates can be regarded as a technicality: The three comparisons between the Tables 5 and 6 are:

First, the effect of the experimenter, which results for the run-scores in p=.12 and for the session-scores in p=.19; both are non-significant and not widely different. Secondly, the effect of volitional strategy: this results for the run-scores in p=.0034 and for the session-scores in p=.74. These are contrasting results and the same is true for the effect of the interaction between experimenter and volitional strategy. The effect of the interaction results in p=.000024 for the run-scores and in p=.34 for the session-scores.

These two clearly contrasting results warrant the following conclusions:

1. The PK-performance may change on a time-scale of minutes.
2. PK-performance may not only change rapidly, it also shows a relationship with the consciously chosen volitional strategy. This apparently enables the participant to enter a psi-conducive state of mind.
3. The strong interaction found between the experimenter and the performance with different volitional strategies means that the optimum strategy depends on the person of the experimenter and, supposedly, the messages the experimenter is conveying, consciously or subconsciously, about the volitional strategies and possible the whole setting of the experiment.
4. Suggestion and suggestibility come forward as factors playing an important role in present experiment. These factors should be examined more closely in future experiments as they apparently play an essential role.
5. The advantages of a flexible experimental protocol are that unexpected findings are more likely. A rigid protocol does not avoid unwanted experimenter effects, it merely makes them invisible.

ACKNOWLEDGMENTS

Financial support by the Institut für Grenzgebiete der Psychologie und Psychohygiene is gratefully acknowledged. Thanks are due to Simone Launspach, Dipl. Psych., and Stefan Schneider, Dipl. Psych., who took part as experimenters in the experiment and who contributed to the data analysis in a dedicated manner. I wish to acknowledge the comments by an anonymous referee which contributed to the clarity of this paper.

References

Costa, P. T., & McCrae, R. R. (1992). *The NEO personality inventory manual*. Odessa, FL: Psychological Assessment Resources.

Forwald, H. (1952). A Continuation of the Experiments in Placement PK. *Journal of Parapsychology, 16,* 273-283.

Forwald, H. (1969). *Mind, Matter, and Gravitation*. Parapsychological Monographs No.11. New York: Parapsychology Foundation.

Gissurarson, L. R. (1997). Descriptive analysis of mentations on volitional tasks. *Journal of the Society for Psychical Research, 62*, 22-35.

Houtkooper, J. M. (2000). Mind-Machine Interaction: Two Phases of replication in Giessen. *Proceedings of the 43rd annual convention of the Parapsychological Association* (Freiburg, August 17-20, 2000), 419.

Houtkooper, J. M. (2002). Arguing for an observational theory of paranormal phenomena. *Journal of Scientific Exploration, 16*, 171-185.

Houtkooper, J. M. (2003). A forced-choice ESP experiment with natural and simulated sferics: Displacement scores and psychological variables. *Proceedings of the forty-sixth annual convention of the Parapsychological Association* (Vancouver, Canada, August 2-5, 2003), 82-97.

Houtkooper, J. M. (2004) Exploring volitional strategies in the Mind-Machine Interaction replication. *Proceedings of the forty-seventh annual convention of the Parapsychological Association* (Vienna, Austria, August 5-8, 2004), 51-65.

Irwin, H. J. (1985). Parapsychological phenomena and the absorption domain. *Journal of the American Society for Psychical Research, 79*, 1-11.

Irwin, H. J. (2004). *An introduction to parapsychology* (4th edition). Jefferson, N.C.: McFarland.

Jahn, R. G., & Dunne, B. J. (1987). *Margins of reality. The role of consciousness in the physical world.* San Diego: Harcourt Brace.

Jahn, R., Dunne, B., Dobyns, Y., Lettieri, A., Nelson, R., Mischo, J., Boller, E., Bösch, H., Vaitl, D., Houtkooper, J. M., & Walter, B. (2000). Mind/Machine Interaction Consortium: PortREG Replication Experiments. *Journal of Scientific Exploration*, *14*, 499-555.

Kennedy, J. E. & Taddonio, J. L. (1976). Experimenter effects in parapsychological research. *Journal of Parapsychology, 40,* 1-33.

Schmidt, H. (1997). Random generators and living systems as targets in retro-PK experiments. *Journal of the American Society for Psychical Research,* 91, 1-13.

Schneider, S. (1999). *Einfluss psychologischer Variablen und des experimentellen Settings auf die Scores eines Psychokinese- und Präkognitionstests. [The influence of psychological variables and the experimental setting on the scores on a psychokinesis and a precognition test.]* Master's thesis, Department of Psychology, University of Giessen.

Smith, M. D. (2003). The role of the experimenter in parapsychological research. *Journal of Consciousness Studies,* 10(6-7), 69-84.

Stanford, R. G. (1977). Experimental psychokinesis: A review from diverse perspectives. In: B.B. Wolman (Ed.) *Handbook of parapsychology*. New York: Van Nostrand Reinhold. (pp. 324-381)

Thouless, R. H. (1951). A Report on an Experiment on Psycho-Kinesis with Dice, and a Discussion of Pschological Factors Favouring Success. *Proceedings of the Society for Psychical Research, 49,* 107-130.

White, R. A. (1976a). The influence of persons other than the experimenter on the subject's scores in psi experiments. *Journal of the American Society for Psychical Research, 70*, 133-166.

White, R. A. (1976b). The limits of experimenter influence on psi test results: Can any be set? *Journal of the American Society for Psychical Research, 70,* 333-369.

White, R.A. (1977). The influence of experimenter motivation, attitudes and methods of handling subjects on psi test results. In: Wolman, B.B. (Ed.) *Handbook of Parapsychology*. New York: Van Nostrand Reinhold.

Wilkinson, L. (1990). *SYSTAT: The system for statistics.* Evanston, IL: Systat Inc.

APPENDIX

Instruction about volitional strategies (translated from the German)

Persons who had good results in psychokinesis experiments, often described their "method" as:

A. Imagining a picture of a positive result.
B. Being attentive and at the same time relaxed.
C. A positive feeling or confidence about the wanted result.
D. A feeling of resonance with the random generator and/or the computer.
E. Guessing/predicting, in which direction the result will be.

Generally you can decide each time in the experiment, which method best describes what you will be doing. You may choose one of the above mentioned options, or you may choose your own method. Before you start a run, note your intention and your method. Thereby you can use the above letters A to E, respectively X, if you are going to use your own method. Please describe your own method on the reverse side of the protocol. If you want to refrain from noting your method, just put a stroke in the column "Method". Note: During a run, stay with the method you have chosen, also when it seems that it doesn't bring the wanted result. After each run, please write down the mean score and if you want you may comment on your experience during the run.

REMOTE STARING DETECTED BY CONSCIOUS AND PSYCHOPHYSIOLOGICAL VARIABLES

COMBINING AND IMPROVING TWO SUCCESSFUL PARADIGMS

Susanne Müller[1], Stefan Schmidt[1] & Harald Walach[2]

[1]*Department of Evaluation Research in Complementary Medicine*
Institute of Environmental Medicine and Hospital Epidemiology
University Hospital Freiburg, Germany
[2] *University Northampton, School of Social Sciences and Samueli Institute, European Office*

ABSTRACT

Findings in parapsychology suggest an effect of distant intentionality. Two laboratory set-ups explored this topic by measuring the effect of a distant intention on psychophysiological variables. The DMILS (direct mental interaction in living systems) experiments investigate the effect of various intentions on the electrodermal activity (EDA) of a remote subject. The "Remote Staring" experiments examine whether gazing by an observer (starer) covaries with the electrodermal activity of the person being observed (staree).

In two meta-analyses (Schmidt, Schneider, Utts & Walach, 2004) it became obvious that the remote staring studies had a lower overall quality than the DMILS studies. While there are some high quality DMILS studies (score over 90%) the highest quality in Remote Staring studies is 71%. Thus there is a lack in studies with good methodology to assess the remote staring paradigm.

We conducted a remote staring study that intended to overcome methodological shortcomings of earlier studies Fifty participants were invited to take part as starees. After completing questionnaires on mindfulness, mood, personality and paranormal belief they rested in a comfortable position in front of a video camera while their EDA was continuously monitored. The experimenter also acted as the starer and either observed or did not observe the participant through a closed circuit television system according to a random schedule. EDA during stare and non-stare epochs was compared for significant differences.

In addition to this basic (replication) set-up two new hypotheses were tested. The participant had the possibility to press a button whenever s/he feels stared at. This added a conscious response variable without engaging into the disadvantages of the standard conscious guessing paradigm (guessing strategies, response bias etc). Furthermore the distraction of the starer's intention during non-stare epochs was varied. In one condition s/he was mentally occupied by a cognitive task, in the other s/he was just told not to stare (standard condition). We hypothesized that the distraction from the target in the standard condition was too weak to avoid an unwanted intentional effect in the staree.

Overall we did not find any staring effect at all, not in the EDA data and not in the 'conscious' open response situation. Thus the experiment failed in demonstrating any Psi effect.

INTRODUCTION

The era of examining the "everyday phenomenon" of feeling unseen gazes in a laboratory setting has a long history and can be differentiated in two main paradigms: the simple test setting and the more sophisticated one:

In the first kind of experiment in a randomized series of trials the starees are looked at (or not looked at) directly by another person sitting behind them, watched through a one-way mirror or watched by closed circuit television system and for each trial they had to make – in forced-choice way - guesses if they were looked at or not (Titchener, 1898; Coover, 1913; Poortman 1959; Peterson, 1959; Williams, 1983; Sheldrake, 1994, 1998, 1999, 2000).

All of these "the way of being stared at" or "unseen gaze" – studies were quite informally conducted and hardly shielded against sensory cueing.

A radical change in methodology towards the more sophisticated testing began with the studies of Braud et al in 1990. He and his colleagues pointed out that the effect sizes of the former studies were not very impressive because all these studies "were designed to encourage deliberate conscious guessing in order to identify staring periods" (1993a, p.376) and that stronger effects could be obtained if relatively "unconscious" autonomic nervous system activity were used as the indicator of staring detection, rather than conscious guessing "…because … autonomic reactions might be less distorted by higher cognitive processes and therefore might provide a purer and more sensitive indicator" (1993b, p. 392).

From the late 1970´s until the early 1990´s Braud and his colleagues conducted altogether a series of 37 so called DMILS studies in the laboratories of the Mind Science Foundation in San Antonio (Schlitz & Braud, 1997).

DMILS is the abbreviation of "direct mental interactions with living systems". In DMILS research an individual (agent) tries by means of mental intention and volition to interact with the behavioral or psychophysiological response of another, sensory isolated living target system (receiver). The most frequently response system that is studied in DMILS research is the electrodermal activity (EDA) of the receiver which the agent attempts to calm or activate during an experimental session. A typical DMILS session consists of 10 "activate" periods, 10 "calm" periods (and 20 "rest" periods in between) whose ordering is randomized and counterbalanced. Under the null hypothesis there is no difference to be expected between the receivers EDA arousal during the calm or activate periods.

The first remote-staring experiments were conducted by Braud and colleagues in the early nineties (Braud, Shafer & Andrews, 1993a, 1993b). In these EDA "remote staring" DMILS studies the paradigm of former DMILS-studies was combined with a quite simple design to test if people were able to detect when they are watched (or stared at) by a sender in a distant room. An experimental session consisted of two periods in random sequence: during a staring period the starer (agent or sender) was told to look intently at the real-time image (on a monitor or screen) of the staree (receiver) which is conveyed to him through a closed-circuit video camera system. His task was not to calm or activate the staree like in the DMILS-studies; in the non-staring periods the starer just turned away from the monitor and kept his mind busy with anything else than the experiment.

Altogether the four series of remote-staring experiments revealed significant results. The starees EDA was significantly more activated during the staring periods compared to their EDA level during the non-staring periods.

The experiments that followed the same paradigm (Schlitz & LaBerge, 1997; Wiseman & Schlitz, 1997; 1999; Wiseman & Smith, 1994; Wiseman, Smith, Freedman, Wasserman & Hurst, 1995) can be regarded as conceptual replications of Braud's experiments. Most of them also revealed significant results by measuring the extent of activation during staring periods but the way the EDA was measured showed some shortcomings and thus leaves some doubt about the validity of the results (Schmidt & Walach, 2000).

Most popular today are the studies conducted and promoted by Rupert Sheldrake, run in style of the older - more simple - paradigm that made the conscious guessing of the staree the interesting outcome-variable. Sheldrake conducted or supervised big series of experiments mostly in schools and could always prove overall positive results with extremely high significances: while the responses at staring epochs were constantly above chance they were around chance at non-staring epochs (Sheldrake, 1998, 1999, 2000, 2001, 2003, 2005). Anyway there are still a lot of controversies concerning the methodology as well as the statistical analysis of these experiments (Schmidt, 2003;, 2005) .

Taken the impressive results of Sheldrake it looks like Braud and colleagues were wrong by speculating that "…in bypassing the cognitive processes, one avoided a "noise" source that could potentially obscure the relatively weak psi signal." (Delanoy, 2001, p. 34).

So far a comparison between these two paradigms has just taken place in a few studies (i.e., Tart, 1963; Targ & Puthoff, 1974; Dean, 1974; Delanoy & Sah, 1994; Lobach & Bierman, 2004). The results of these studies support the idea that the unconscious, autonomic responses measured in EDA tasks may provide a more sensitive instrument for detecting staring/psi effects whereas the conscious guess measure did not differ meaningfully from chance expectations.

In our study we made a direct comparison between these two measures:

Additionally to the measure of the autonomic reaction of the staree (EDA) we also measured the "conscious reaction". This procedure has some advantages:

By conscious guessing alone it will be difficult for the staree to avoid guessing strategies, response biases or intellectual analyzing and so forth. On the other side the phenomenon in everyday life is described by a conscious response and the question is open how this is modulated.

By measuring nervous processes and the possible difference in staring and non-staring periods and by comparing them with the conscious guessing it may be possible to find results about their interactions and the possible correlation of this interaction with other variables (i.e. personality, belief in Psi, mood).

So far conscious reports in staring experiments were received through a forced-choice procedure where "… the receiver must engage in overt cognitive processing to provide a response to the target" (Delanoy, 2001, p. 35). But this procedure is rather different from a daily life experience, where one is not asked whether one has been stared at but notices so in a particular moment. While the forced-choice procedure invites for certain guessing strategies and reflections on the subsequent answer in dependence from the last one, this is not true for the daily life situation.

Thus we introduced in our experiment an open response situation that has a higher ecological validity than a forced-choice procedure. The starees in our study didn't have to make a decision about staring "yes" or "no" at a particular moment but were asked to press a button whenever he or she had the feeling that the starer tried to get connected with them and to release this button again when this feeling vanished. To avoid any cognitive strategies they were not informed on the number of staring vs. non-staring epochs their length or their starting point.

We furthermore introduced a new procedure on the side of the starer. Normally the agent/starer is asked to maximize his/her attention during staring periods and to think about something else during non-staring periods. Presuming that staring at somebody in daily life is just a process of focusing on a specific intention (unconscious or conscious) which in turn can be detected by a staree (unconscious or conscious), it is absolutely necessary that the agent maximizes his or her attention in order to make the experimental situation as close to real life as possible. But the harder part of the agent's task is to turn off his or her attention and intention in non-staring periods! Everybody knows that trying to do so usually produces the opposite. S/he will think exactly about what they should not think about, no matter how hard they try to make themselves busy. Presuming that there is the possibility of agent and receiver to get connected somehow by focused attention it can be assumed that the agent will be confused by this "steady attention" and may feel to be stared at even during the non-staring condition.

In order to avoid this we did not only ask the starer to maximize his attention during staring periods, but also made him or her minimize his/her attention in the non-staring periods by occupying him/her with a mental task that should result in "forgetting" about the staree for a short time. The starer was asked to perform a demanding cognitive test, exciting enough to capture the mind but also simple enough to turn away from upon the start of the next staring period. This procedure aimed at increasing the variance in the intentions of the starer between staring and non-staring epochs and thus we expected also larger effects in the reactions (conscious and unconscious as well) of the staree.

To find out whether there is a difference in the magnitude of the reactions (conscious and unconscious) of the staree, half of the sessions for each starer were conducted in the "normal" way, (this means he/she was told just to turn away from the screen in the non-staring periods and try hard to think about anything else but the staree). In the other half the starer was occupied with the cognitive task in the non-staring periods.

To find out more about the role of the starers´ task to minimize his attention can be of great advantage for further parapsychological experiments. In spite of Braud and his colleagues´ assertion "…that the quality of the starers´ attention is important in determining the nature of the experimental outcome" (2001, 405p.), no study so far has tried to find out about this "pure attention component".

Altogether our objectives were as follows:

- To replicate the two main staring paradigms (conscious report, EDA) in one experimental setting under best controlled conditions with state of-the-art EDA measurement (Schmidt & Walach, 2000).

- To assess a new method of recording conscious responses that overcomes the disadvantages of the standard forced choice method.

- To find out about the moderating variables of a possible staring detection effect. Related to this is the need to better understand the different roles of the various participants in a staring experiment (starer/agent and staree/receiver).

- To try to increase the staring detection effect by eliciting a larger variance in the attention/no attention task of the agent.

METHODS

SETTING

Location

All experimental sessions were conducted in a two-floor-building belonging to the Institute for Environmental Medicine at the University Hospital in Freiburg. Starer and staree were located in two entirely separated rooms in different wings of the building. The staree´s room was located on the ground floor and the starers´room on the first floor approximately 20m in distance. The physical separation of these rooms together with the standard use of a closed-circuit video system made any conventional communications impossible.

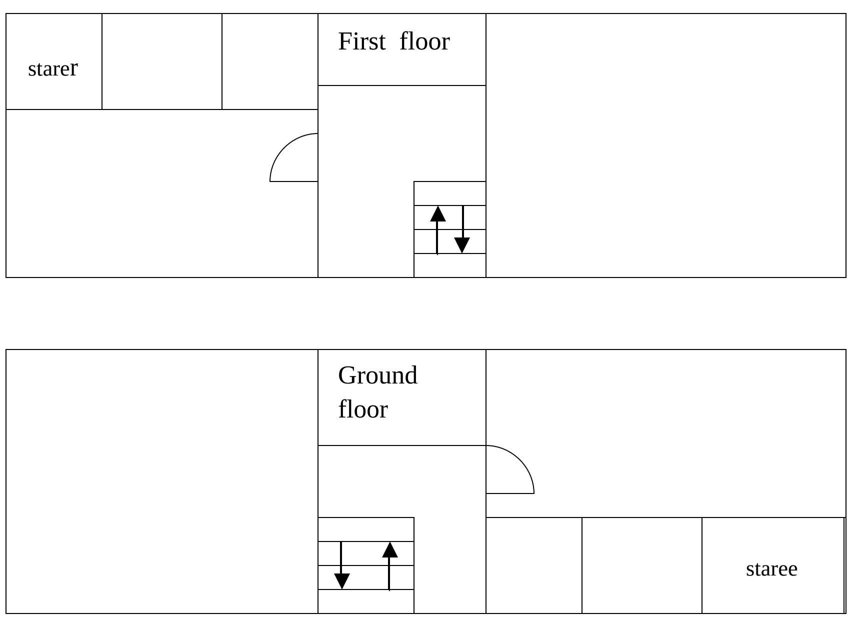

Figure 1: Plan of the location where the experiment took place

During the experimental session the staree sat quiet and relaxed in a comfortable chair. Jewelries and mobil phones had to be removed before the start of the session. In order to eliminate any noises from outside which could influence the measurement of the EDA the starees wore special headphones, which extremely attenuate sounds from the environment (Sennheiser HD 280 Pro). In addition the participants listened to a special music (Dr. Harold Moses – "The Drone") which did not contain any sudden changes or beats in order to make them relaxed and comfortable without interfering with the EDA measurement.

Participants (starees /starers)

Fifty participants - recruited through leaflets – took part in the experimental sessions in exchange for 10 Euros. Twenty-six participants (52%) were female, twenty-four participants (48%) were male and the mean age of all participants was 32.5 years (SD = 10.3, range 20-57). There were no special criteria for the participants; everybody who was interested to participate was invited. Thereby the participants were a self-selected sample.

The whole study was conducted by two experimenters - one female and one male - who also acted as the starers (agents). They were hired for this study and extensively trained in a pilot study.

The complete organization and conductance of this study was carried out by the first author SM.

Materials

*Video equipment.*A video camera (Axis©Netcam206) was positioned half in front and half sideways of the staree and transmitted real-time images to a monitor in the starer's room. This one-way closed circuit video system allowed the starer (the experimenter) to see the participant but not the other way round.

*EDA-measurement.*The staree's electrodermal activity was assessed by measuring skin conductance (SC-) with a constant voltage method (0.5 V) according to the guidelines by the Society for Psychophysiological Research (Fowles, Christie, et al. 1981). Skin conductance level (SC) was recorded with two 8mm Ag/AgCL electrodes placed on the thenar and hypothenar eminences of the non-dominant hand. An isotonic electrode gel was applied and a time lag of at least 20 minutes between electrode application and start of measurement was maintained to allow for skin adaptation processes.

SC-data was recorded by a skin conductance device built especially for this purpose by the University Hospital's electronic workshop. This device splitted the data into two channels, the tonic signal (SCL) and the phasic signal (SCR). The latter one was derived by treating the SCL with a time constant of 10s. Data was digitized (12 bit) and sampled at 20 Hz for each channel.

Two variables were derived from this data (i) Number of non-specific skin conductance responses (NS.SCR for more details see Schmidt & Walach, 2000), (ii) skin conductance level (SCL) calculated as a mean over all samples during an epoch. While the first one is the *main dependent variable* for this study the latter one was recorded for exploratory use.

The signal generated by the button presses of the participant was recorded together with the EDA raw data in a separate channel. Respiration was recorded by a piezo based respiration belt placed on the upper abdomen and also stored in a separate channel.

Conscious guessing. In order to record whenever a staree felt stared at the participants were provided with a tiny switch on their dominant hand (EDA recording took place on the non-dominant hand) and were asked to push this switch into the "stared at position" whenever they had the feeling that they were being observed. The switch remained in this position by itself and participants were thus also asked to bring the switch back to the "not-stared-at position", whenever they felt there was nobody staring at them from a distance.

*Questionnaires.*Participants were asked to complete the following questionnaires:

1. ***"Belief-in-Psi"***

Three questions similar to the ones that Wiseman and Schlitz used in their study (Wiseman & Schlitz, 1997). The three questions concerning the subjects' attitudes toward psi. They will indicate their responses on a seven-point scale ranging from –3 to +3.

A general "belief-in-psi" score is obtained by summing the respondents´ responses over all three questions. The questions are as follows:

Are you convinced about the existence of psi?

Certain -3 -2 -1 0 +1 +2 +3 Not at all

What best describes your own psi ability?

I have psi ability -3 -2 -1 0 +1 +2 +3 I have no psi ability

Do you believe you might be able to demonstrate any psi ability in this experiment?

Yes -3 -2 -1 0 +1 +2 +3 No

Each staree had to answer these questions before the experimental session.

2. ***"Mindfulness"*** **(**Freiburg Mindfulness Inventory; FMI)

Participants were asked to fill in the 14 item short form of the Freiburg Mindfulness Inventory (FMI) (Buchheld, Grossman & Walach, 2001; Walach, Buchheld, Buttenmüller, Kleinknecht & Schmidt, in press). This includes, apart from awareness for the environment, also the awareness of one's own mental processes, emotions and signals from the body. The short form of this questionnaire can be filled out by people who are not familiar with the mindfulness concept itself.

The rational for measuring mindfulness in participants was to find out how the ability to be continuously aware of the present moment is related to the detection of a remote stare observation. The rationale for measuring mindfulness in the starer was to find out whether the ability to be aware of the presence is related to a better performance. Mindfulness, intention and attention share aspects that are likely to be important for these kinds of intention experiments.

Each staree had to fill out this questionnaire before the experimental session.

3. ***„Well-being"*** (Befindlichkeitsskala; Bf-s)

General well-being was measured by the Bf-s (Zerssen, 1976), an adjective list which measures general well-being in 28 pairs of adjectives with opposite semantic content arranged in a semantic differential. The scale is a widely used, psychometrically sound scale for measuring short term changes in well-being.

The staree had to fill out this scale shortly before and directly after each session.

The starer had to fill out this scale shortly before each experimental session.

Procedure

The procedure was mainly equal to the "classical" staring experiments by Braud and colleagues (Braud et al., 1993a, 1993b) with the following changes or extensions:

Each experimental session was conducted individually by one of the two experimenters (starers).

After the questionnaires had been filled out, the electrodes had been attached, the respiration belt fastened and the headphones put into position the participant was left alone for five minutes in order to record his/her basal skin resistance (baseline). The experimenter reentered the staree's room, saved the baseline data and then went to his room upstairs. Exactly 6 minutes after s/he had left the participant s/he started the computer program that ran the whole session. This program was written in VBA; it sampled and stored the incoming data, selected the random sequence, and controlled the monitor for the starer by switching between the picture of the staree and a blank screen (standard condition) or a computer game (distraction condition).

The only thing the experimenter had to do manually was to set up the program for either the standard or the distraction condition. The sequence of these two conditions throughout all the sessions was in a randomized order with the same number for both. Each of the experimenters had a package of sealed envelopes locked in a cabinet drawer. Before starting the program s/he chose the envelope labeled with the smallest number and like this found out about the ongoing condition.

During a staring epoch the experimenter saw the real-time image of the staree on the monitor. During the condition where he/she was kept busy with the computer game through the non-staring period, the game just appeared on the monitor and in the other condition s/he was presented a "non-staring" instruction on the screen.

The sequence of these epochs was in a randomized order with the same number of staring and non-staring trials. The sequence was balanced in a way to avoid linear trends (such as a steady decrease in skin conductance or trends caused by shifts in the amplifier etc) potentially resulting in artefacts. An algorithmic random process was employed to draw a sequence out of a pool of sequences fulfilling the above criteria. One epoch lasted 60 seconds. There were 10 staring and ten non-staring epochs. Staring and non-staring epoch were interspersed by short rest intervals of variable length (5-15 seconds, randomly assigned). Thus the overall session length summed up to 23-30 minutes.

It is important to notice that the experimenter (the starer) was blind to the sequences of the epochs. Also the starees were blind against the sequencing of these two types of epochs but also against the number and the timing. They were just told that the camera would be switched on through the whole session but that the starer would only look at the monitor at certain times.

After the session was finished the experimenter waited for five more minutes before s/he entered the staree's room. Thereby, a second baseline at the end could be recorded.

In a pilot study with ten participants the laboratory set-up, the measurement devices and all procedures were tested in order to perform the main study according to a strict protocol. Before the beginning of the main study in January, this protocol was deposited with Eberhard Bauer (IGPP, Freiburg).

HYPOTHESES

Our hypotheses were as follows:

MAIN HYPOTHESES

1. *Staring Hypothesis (proof oriented)*

Remote Staring: unconscious response (EDA) There will be a significant difference in the starees´ electrodermal activity between staring and non-staring periods. The direction of this difference will not be specified (two-tailed test).

Phasic Activity: There will be a significant difference in the value „NS.SCR.frequencies > 0.01 μS" between staring and non-staring periods. The direction of this difference will not be specified (two-tailed test)

Tonic Activity: The same analysis will be performed for SCL for exploratory use.

Remote Staring: Conscious response Starees will press the staring button more often and for longer periods during staring epochs than during non-staring epochs.

2. *Distraction Hypothesis*

Remote Staring: unconscious response (EDA) The differences in the starees´ electrodermal activity (between staring and non-staring epochs throughout all the experimental sessions) in the sessions where the starer will be occupied by a cognitive task will be significantly higher than the differences in the starees´ electrodermal activity in the sessions where the starer is asked just to "think about something else" while not staring.

Remote Staring: Conscious response Starees will press the staring button more often and for longer periods during non-staring epochs in the condition when the starer is asked just to "think about something else" while not staring, than in the condition when s/he will be kept busy by playing a computer game.

DATA ANALYSIS AND STATISTICS

SCR-CHANNEL

The data were first transformed into standardized measured values and then treated with a 0,5 Hz low-pass filter. Afterwards each of the twenty phases was analyzed for NS.SCR.frequencies as well as for NS.SCR. sum of amplitudes with a special software (EDA-Para). The value threshold limits regarding to analyzing the data were 0,01 μS.

Each of these values were added up separately for the two conditions (stare and non-stare) throughout all epochs of one experimental session. Like this each session resulted into two pairs of values (consisting of the sums of staring and non-staring epochs).

SCL-CHANNEL

After being transformed to standardized measured values (μS) each of the 60 sec epochs were averaged. These mean values were averaged over all epochs of the same type (10 * staring and 10 * non-staring). Thus each session resulted in one pair of values (consisting of the mean value of the staring and the mean value for the non-staring epoch).

RESPIRATORY ACTIVITY

Respiratory activity was recorded but not analyzed. The data is available for later analyses.

ANALYSING „CONSCIOUS GUESSING"

Changes in the switch position were also analyzed per epoch and then summed up over all epochs for each of the two conditions. There were two variables extracted from this data: (i) number of times the switch was moved from the "not stared at" to the "stared at" position. (ii) percentage of samples within an epoch where the switch was in the "stared at"-position (with 100% indication all the time and 0% indicating never).

While the first variable was analyzed confirmatorily, the second variable was for exploratory use.

CRITERIA FOR EXCLUSION OF DATA

In our protocol we prespecified a set of exclusion criteria for the EDA data in order to exclude SCR non-responders from the analysis. A dataset was excluded from analysis if:

- Mean-SCL-value for more than 4 60 sec. epochs was less than 0.5 μS
- The complete dataset showed less than 10 * NS.SCR > 0.01 μS

Datasets were also excluded from the analysis if

- One electrode was disconnected during recording
- The staree wanted to discontinue the experimental session
- Anything else happened that could invalidate data recording

Questionnaire data, calling sequences and guesses of the participants were entered into SPSS for Windows 13.0. Further analyses were conducted in SPSS and in Excel.

For the *Main-Hypothesis - Hypothesis 1* (Staring Hypothesis) we proceeded as follows:

For each participant one pair of values was available. These pairs of data were tested for normal distribution (Kolmogorov-Smirnoff-test), and compared by a t-test for dependent variables..

For the *Main-Hypothesis - Hypothesis 2* (Distraction Hypothesis) we calculated as follows:

Throughout all experimental sessions two pairs of values were available. These values were used to calculate a per-session success score. Next session success scores of distraction sessions and standard sessions were compared for significant differences. As the criterion "normal distribution" was fulfilled (p

> 0.05) a t-test for independent variables (one-tailed, $\alpha = 0.05$) was computed. This was calculated for the NS.SCR data. The same analysis was computed for the other scores (SCL, button presses) but only in an exploratory fashion.

RESULTS

Of the 50 participants only 35 fulfilled the above inclusion criteria. We had a prespecified sample size of 40 in our protocol. But as the study proceeded more slowly than expected and more participants than anticipated fulfilled the exclusion criteria we had to stop with 35 valid data sets only, as the experimenters were no longer available. This decision was taken without any inspection or analysis of the data and was motivated purely by pragmatic reasons.

1. STARING HYPOTHESIS:

TABLE 1: NS.SCR FREQUENCIES DURING STARE AND NON-STARE TRIALS

		mean	n	standard deviation	standard error
pairs	NS.SCR´s frequencies in stare trials	21,71	35	12,77	2,16
	NS.SCR´s frequencies in non-stare trials	21,46	35	13,54	2,29

The average of NS.SCR-frequencies did not differ in stare (m=21.71, sd=12.77) vs. non-stare-trials (m=21.46, sd=13.54); t=.21 n.s., p=.84 (two-tailed), effect size d = 0.04.[1]

TABLE 2: NS.SCR. SUM OF AMPLITUDES DURING STARE AND NON-STARE TRIALS (EXPLORATORY ANALYSIS)

		mean	n	standard deviation	standard error
pairs	sum: NS.SCR in stare trials	5,00	35	4,19	,71
	sum: NS.SCR in non-stare trials	4,91	35	4,49	,76

The average sum of NS.SCR-amplitudes did not differ in stare (m=4.99, sd=4.19) vs. non-stare-trials (m=4.91, sd=4.49); t=.28 n.s., p=.78 (two-tailed).

For the skin conductance level (SCL) the mean SCL did not differ in stare (m=3.82µS, sd=2.10) vs. non-stare-trials (m=3.80µS, sd=2.13). The variables were normally distributed and thus we applied a t- test to compare the means. The difference proved to be not significant (t = 1.25 n.s., p = .22).

Remote Staring: Conscious response

Participants were provided with a switch to signal whenever they felt stared at. Out of our complete sample of 50 participants 7 never used this switch, and we only analyzed the remaining

[1] Effect size calculated with $d = t/\sqrt{df}$

43. Our main analysis counted how often the switch was pushed into the "stared at" position during staring and non-staring epochs. On average, participants pushed the switch 9.9 times during either "stared at" or "not stared at" epochs (range 1-40, SD = 8.2). They used the switch more often during "stared at" epochs (mean = 5.2, sd= 4.2) than during "not stared at" epochs (mean = 4.7, sd = 4.3). The variables were not normally distributed and thus we applied a Wilcoxon Signed Rank test to compare the means. The difference proved to be not significant (z = 1.47, p = .14).

As an additional exploratory analysis we calculated the percentage of time during which the switch was kept in the "stared at" position by the participant. Overall participants had the switch 23.9% of the time in this position (range 0.4 % - 60.3 %, sd = 15.7). During "stared at" epochs the switch was in 25.1 % (sd = 17.0) of the time in the stared at position, during "not stared at" epochs 22.8 % (sd = 16.9) of the time.

The variables were normally distributed. The difference was not significant (paired sample t-test, t = 1.17, df = 42, p = .25)

2. DISTRACTION HYPOTHESIS:

Remote Staring: unconscious response (EDA)

There were 16 sessions where the distraction condition took place (matrix task) and 19 with the standard procedure (blank screen). Regarding the SCR variable (NS.SCR.frequencies; NS.SCR.sum of amplitudes) the results can be seen in Table 3:

TABLE 3: DIFFERENCE OF NS.SCR FREQUENCIES AND NS.SCR. SUM OF AMPLITUDES BETWEEN STARE AND NON-STARE TRIALS (MATRIX VS. NO-MATRIX CONDITION)

	matrix	n	means	standard deviation	standard error
NS.SCR: frequencies: stare trials - non stare trials	matrix	16	2,13	7,60	1,90
	no matrix	19	-1,32	7,06	1,62
NS.SCR: amplitudes: stare trials - non stare trials	matrix	16	,49	1,95	,49
	no matrix	19	-,25	1,78	,41

The average difference of NS.SCR-frequencies between stare and non-stare trials was larger in the matrix (m=2.13, sd=7.6) than in the no-matrix condition (m= -1.32, sd=7.06). Also the average difference of NS.SCR. sum of amplitudes between stare and non-stare trials was larger in the matrix (m=.49, sd=1.95) than in the no-matrix condition (m= -.25, sd=1.78).

As the variables were normally distributed we applied a t-test to compare the means. The difference proved to be not significant (independent samples t-test, t = 1.39, df = 33, p = .16).

For SCL the results looked as follows:

TABLE 4: DIFFERENCE OF SCL BETWEEN STARE AND NON-STARE TRIALS (MATRIX VS. NO-MATRIX CONDITION)

	matrix	n	means	standard deviation	standard error
SCL: stare trials - non stare trials	matrix	16	,09	1,07	,27
	no matrix	19	,36	1,17	,27

The average difference of the SCL between stare and non-stare trials was smaller in the matrix (m=.01µS, sd =.11) than in the no-matrix condition (m= -.04µS, sd=.12).

As the variable was normally distributed we applied a t-test to compare the means. The difference proved to be not significant (independent samples t-test, t = .72, df = 33, p = .48).

Remote Staring: conscious response

TABLE 5: DISTRIBUTION OF BUTTON PRESSES THROUGHOUT MATRIX VS. NO-MATRIX CONDITION

	matrix	n	means	standard deviation	standard error
"button on" in stare trials	matrix	20	4,55	2,74	,61
	no matrix	23	4,35	4,50	,94
"button on" in non stare trials (%)	matrix	20	4,20	3,68	,82
	no matrix	23	4,30	4,47	,93
"button on" in stare trials	matrix	20	29,12	17,79	3,98
	no matrix	23	21,56	15,76	3,29
"button on" in non stare trials (%)	matrix	20	23,09	13,80	3,09
	no matrix	23	22,52	19,56	4,08

TABLE 6: DIFFERENCES BETWEEN THE TWO CONDITIONS (MATRIX VS. NO MATRIX)

		"button on" in stare trials - "button on" in non stare trials	"button on" in stare trials (%) - "button on" in non stare trials (%)
no matrix	mean	,04	-,96
	n	23	23
	standard deviation	2,03	9,93
matrix	mean	,35	6,03
	n	20	20
	standard deviation	1,95	14,85

Our main analysis counted how often the switch was pushed into the “stared at” position during staring and non-staring epochs in the *matrix* (=distraction) condition compared to how often the switch was pushed into the “stared at” position during staring and non-staring epochs in the *no matrix* condition. (Also here we only analyzed the 43 out of 50 participants who used the switch at all).

As an additional exploratory analysis we also calculated the percentage of time during which the switch was kept in the “stared at” and “non-stared at” position during the *matrix* condition compared to how often the switch was pushed into the “stared at” position during staring and non-staring epochs in the *no matrix* condition.

As both variables were normally distributed we calculated an independent t-test to compare the two conditions. The differences proved to be not significant.

Frequency of “button on” in stare trials - frequency of “button on” in non-stare trials (matrix vs. no-matrix condition): Independent samples t-test, t = .50, df = 41, p = .62).

Percentage of time of “button on” in stare trials - Percentage of time of “button on” in non-stare trials (matrix vs. no-matrix condition): Independent samples t-test, t = 1.84, df = 41, p = .07).

DISCUSSION

We conducted a remote staring experiment where we combined two strands of research which ran in parallel for several years. So far researcher have investigated this phenomenon by either employing a physiological (‘unconscious’) measurement (i.e. EDA) as dependent variable or by asking the subjects directly whether they were stared at or not (conscious forced choice paradigm). Furthermore we replaced the forced choice situation by an open response procedure, where the participants could indicate at any time if they have feelings of being stared at (or not) without being prompted. Moreover we tested a hypothesis on the distraction process of the starer while *not* staring at the participant. To do this, we either distracted the starer completely from the staree by a demanding cognitive task, or we left him or her (according to the standard paradigm) with just a blank screen. The difference between the two conditions was not significant (p=.07) but for the condition where the starers were distracted (N=20) we found a medium effect size for a staring effect according to our hypothesis of d =.43 (p =.085) for the difference between staring and non staring epochs. This may be a chance result, but is large enough to follow-up the distraction hypothesis in another experiment with a larger sample.

In all other analyses we did not find any staring effect, not in the EDA data and not in the ‘conscious’ open response situation. The experiment failed in demonstrating any Psi effect.

First of all this releases us from the burden to demonstrate that no conventional information transfer was possible in our newly created remote staring set up. But why couldn’t we demonstrate similar staring effects like other researchers active in this field? There are three well known lines of reasoning we would like to follow in short: (i) there is no such thing as a ‘remote staring’ effect and other researchers have mistaken artifacts for such an effect, (ii) there is such an effect which we missed for reasons to be discussed and finally (iii) the psi phenomenon under consideration is not showing up in a stable and replicable mode but moderated by variables in a larger context or by the systemic set-up of the experimental paradigm in general.

The first (i) position focuses mainly on the methods and set-ups of earlier work and we would not like to engage in such a discussion here. This has already taken place elsewhere (see Schmidt, Schneider, Utts & Walach, 2004). There we have explained that in our view some effects can be attributed to methodological shortcomings but that there remains a substantial effect which lacks a classical explanation.

Regarding the position (ii) we can put our study in line with the two other recently published studies (Lobach & Bierman, 2004; Schlitz, Wiseman, Radin & Watt, 2005), which also failed to replicate staring effects with EDA as well as conscious guessing as dependent variables. Several reasons are possible for such a failure and we will restrict ourselves to just two. In our meta-analysis (Schmidt, Schneider, Utts & Walach, 2004) we calculated an effect-size for the EDA paradigm with d = 0.13 which corresponds approx. to an eighth part of a standard deviation. For an effect so small in size, all remote staring experiments conducted so far, including the one presented here, are underpowered by far. One would need studies with several hundreds of participants in order to achieve a reasonable power. But maybe the effect could just not be demonstrated because our sample was too small. Another possibility is that we didn’t have the adequate experimenters or participants employed who might be necessary to initialize a psi-conducive system. Especially remote staring experiments proved to be sensitive to experimenter effects, (e.g. the Wiseman-Schlitz studies but see also Juniper & Edlmann, 1998). Regarding participants so far only unselected samples have been tested and it was suggested to perform pretests or screening trials to select participants who can perform this task successfully.

The third option (iii), psi phenomena just showing up in an unstable manor, is of course a valid option, but we cannot discuss the various theoretical models referring to this position here. Some of this discussion has been presented elsewhere (Walach & Schmidt 2005).

As there was no overall Psi effect several of our other hypotheses could not be tested. This is especially true for the question, whether occupying the starer by a distracting task during the non-stare epochs can increase the differences between staring and non-staring epochs. Our data pointed into this direction but this can be of course mere chance findings. We nevertheless think that this interesting process oriented hypothesis should be followed up in future experiments. Unfortunately it is not testable in a system which does not show a basic psi effect, as this happened here.

ACKNOWLEDGEMENT

This study and the work of Susanne Müller was funded by the Bial foundation. Stefan Schmidt is funded by the Samueli Institute for Information Biology, as was Harald Walach at the time the experiment was conducted.

We are grateful to Isabell Neu and Marco Petrucci for their contribution as experimenters in this study and to Helge Liebner for his work as software engineer.

Our special acknowledgement however goes to the participants who acted as starees. Without them the study wouldn´t have been possible.

REFERENCES

Braud, W., Shafer, D. & Andrews, S. (1993a). Further studies of autonomic detection of remote staring: Replication, New Control Procedures, and Personality Correlates. *Journal of Parapsychology, 57*, 391 – 409

Braud, W.G., Shafer, D. & Andrews, S. (1993b). Reactions to an Unseen Gaze (Remote Attention): A Review, with New Data on Autonomic Staring Detection. *Journal of Parapsychology, 57*, 372 – 390

Buchheld, N., Grossman, P. & Walach, H. (2001). Measuring mindfulness in insight meditation (vipassana) and meditation-based psychotherapy: The development of the Freiburg Mindfulness Inventory (FMI). *Journal for Meditation and Meditation Research, 1*, 11-34.

Colwell, J., Schröder, S. & Sladen, D. (2000). The ability to detect unseen staring: A literature review and empirical tests. *British Journal of Psychology, 91*, 71-85

Coover, J.E. (1913). The feeling of being stared at. *American Journal of Psychology, 24,* 570 – 575

Dean, D. (1974) reported in Dean, D., Mihalasky, J., Ostrander, S. & Schroeder, L. (1974) *Executive ESP*, Prentice-Hall, Inc., Englewood Clifts, N.J., p. 49

Delanoy, D.L. & Sah, S. (1994). Cognitive and physiological psi responses to remote positive and neutral emotional states. In: D.J. Bierman (Ed.) *Proceedings of Presented Papers of the 37th Annual Parapsychological Association Convention*, Durham, NC: The Parapsychological Association.: pp 128-137

Delanoy, D.L. (2001). Anomalous Psychophysiologial Responses to Remote Cognition: The DMILS Studies. *European Journal of Parapsychology, 16,* 29 -40

Fowles, D. C., Christie, M. J., Edelberg, R., Grings, W. W., Lykken, D. T. & Venables, P. H. (1981). Publication Recommendations for Electrodermal Measurements. *Psychophysiology, 18*, 232-239.

Juniper, Z. & Edlmann, M. (1998). *The Relationship Between Perceptual Vigilance/Defensiveness and Psychophysiological Responses to Remote Staring in the Ganzfeld Condition*. University of Edinburgh.

Lobach, E. & Bierman, D. J. (2004). The invisible gaze: three attempts to replicate Sheldrake's staring effects. *The Parapsychological Association, 47th Annual Convention, August, 5-8, 2004* (pp. 77-90). Durham, NC: The Parapsychologic Association.

Poortman, F. F. (1959). The feeling of being stared at. *Journal of the Society for Psychical Research, 40,* 4-12

Schlitz, M. & LaBerge S. (1997). Covert observation increases skin conductance in subjects unaware of when they are being observed: a replication. *Journal of Parapsychology, 61,* 197 – 207

Schlitz, M. J. & Braud, W. G. (1997). Distant Intentionality and Healing: Assessing the Evidence. *Alternative Therapies in Health and Medicine, 3,* 62-73.

Schlitz, M. J., Wiseman, R., Radin, D. I. & Watt, C. A. (2005). Of two minds: skeptic-proponent collaboration within parapsychology. *The Parapsychological Association, Inc. 48th Annual Convention, August 11th - 15th, 2005* (pp. 171-177). Durham, NC: The Parapsychological Association.

Schmidt, S. & Walach, H. (2000). Electrodermal Activity (EDA) – State of the Art Measurement and Techniques for Parapsychological Purposes. *Journal of Parapsychology, 64,* 139-163.

Schmidt, S. (2002). Außergewöhnliche Kommunikation? Eine kritische Evaluation des parapsychologischen Standardexperimentes zur direkten mentalen Interaktion. Oldenburg: BIS-Verlag

Schmidt, S. (2003). Rupert Sheldrake: "The sense of being stared at and other aspects of the extended mind". *Zeitschrift für Anomalistik, 3,* 263-266.

Schmidt, S. (2005). Comments on Sheldrake's 'The Sense of Being Stared At'. *Journal of Consciousness Studies, 12,* 105-108.

Schmidt, S., Schneider, R., Utts, J. & Walach, H. (2004). Distant intentionality and the feeling of being stared at: Two meta-analyses. *British Journal of Psychology, 95,* 235-247

Sheldrake, R. (1998). The sense of being stared at: Experiments in schools. *Journal of the society for Psychical Research 62,* 311-323

Sheldrake, R. (1999). The "sense of being stared at" confirmed by simple experiments. *Biology Forum 92,* 53-76

Sheldrake, R. (2000). The "sense of being stared at" does not depend on known sensory clues. *Biology Forum, 93,* 209-224

Sheldrake, R. (2001). Experiments on the sense of being stared at: the elimination of possible artefacts. *Journal of the society for Psychical Research 65,* 122-137

Sheldrake, R. (2003). The sense of being stared at and other aspects of the extended mind, Hutchinson – London, United Kingdom

Sheldrake, R. (2005). The Sense of Being Stared At Part 1: Is it Real or Illusory? *Journal of Consciousness Studies, 12,* 10-31.

Targ, R. & Puthoff, H. (1974). Information transmission under conditions of sensory shielding. *Nature, 252,* 605 – 607

Tart, C.T. (1963) Physiological correlates of psi cognition. *International Journal of Parapsychology, 5,* 375 –607

Walach, H., Buchheld, N., Buttenmüller, V., Kleinknecht, N. & Schmidt, S. (in press). Measuring mindfulness—the Freiburg Mindfulness Inventory (FMI). *Personality and Individual Differences.*

Walach, H. & Schmidt, S. (2005). Repairing Plato's Life Boat with Ockham's Razor. The Important Function of Research in Anomalies for Mainstream Science. *Journal of Consciousness Studies, 12,* 52-70.

Williams, L. (1983). Minimal cue perception of the regard of others: The Feeling of being stared at. *Journal of Parapsychology, 34,* 59 – 60

Wiseman, R. & Schlitz, M. J. (1997). Experimenter Effects and the Remote Detection of Staring. *Journal of Parapsychology, 61,* 197-207.

Wiseman, R. & Schlitz, M. J. (1999). Experimenter Effects and the Remote Detection of Staring: An Attempted Replication. *The Parapsychological Association 42nd Annual Convention. Proceedings of Presented Papers* (pp. 471-479). Durham, NC: The Parapsychological Association.

Wiseman, R. & Smith, M. D. (1994). A Further Look at the Detection of Unseen Gaze. In: D. J. Bierman (Ed.), *The Parapsychological Association 37th Annual Convention. Proceedings of Presented Papers* (pp. 465-478). The Parapsychological Association.

Wiseman, R., Smith, M. D., Freedman, D., Wasserman, T. & Hurst, C. (1995). Examining the Remote Staring Effect: Two Further Experiments. *38th Annual Parapsychological Convention. Proceedings of presented papers* (pp. 480-490). Durham, NC: The Parapsychological Association.

Zerssen, D.v. (1976). *Die Befindlichkeitsskala: Manual.* Weinheim: Beltz Test

THE DESIGN AND IMPLEMENTATION OF THE TELEPATHIC IMMERSIVE VIRTUAL REALITY SYSTEM

Craig D. Murray[1], Toby Howard[2], Jezz Fox[1], Fabrice Caillette[2], Christine Simmonds-Moore[3] & David J. Wilde[1]

[1]*School of Psychological Sciences, University of Manchester, UK*

[2]*School of Computer Science, University of Manchester, UK*

[3]*Department of Psychology, Liverpool Hope University, UK*

ABSTRACT

This paper describes a project which has a focus on immersive virtual reality (IVR) as an experimental environment and medium for telepathy. IVR denotes the use of three-dimensional computer graphics technology to generate artificial environments that afford real-time interaction and exploration. These are intended to give the user an impression of being present (‘telepresence’) or immersed in a computer-generated world. A sense of immersion is promoted through the use of head mounted displays (HMDs). These present stereo images and sound to create a perceptually encompassing computer environment. An instrumented data glove allows participants to interact with virtual objects. We argue that IVR has a number of features which make it well suited for the study of telepathy, including a higher degree of experimental control, the co-location of senders and receivers, and the opportunity for more ‘natural’ and meaningful (to participants) experimental trials. In the early stages of the project we have focussed on developing an immersive virtual environment (the Telepathic Immersive Virtual Environment, or TIVE) which acts as the experimental environment for both ‘Sender’ and ‘Receiver’ in the later telepathy trials. This environment looks like a room: for example, it has a door, a window, a chair, a bookshelf and a potted plant. During the experimental trials the bookshelf is filled with four objects. These objects are interactive; that is, both Sender and Receiver are able to pick up and manipulate the target object. In addition the Receiver can also handle three other objects which form part of the target set (the Sender does not see these additional objects). As the Sender and Receiver handle an object in the TIVE they hear a sound evocative of that object. Having constructed the TIVE our work now focuses on two telepathy studies. In these studies the Sender tries to communicate to the Receiver by telepathic means the identity of an object randomly chosen from a set of four (the set is in turn randomly chosen from a group of four sets). Within this paper we describe the general procedure for our telepathy studies using the TIVE. This includes the computerised random process of target set selection (and of selecting which object in the set acts as the target), and the use of gesture recognition for object selection and de-selection. We conclude the paper with some indication of our future plans for the TIVE.

INTRODUCTION

In an earlier paper (Murray, Simmonds & Fox, 2005) we described the embryonic stage of our intention to use immersive virtual reality (IVR) in the study of telepathic communication. In the present paper we describe in much more detail the subsequent design and implementation of an immersive virtual environment constructed in order to explore telepathic communication in a manner which circumvents or minimizes some of the methodological problems associated with previous work in this area. Two major methodological problems which face experimental psychology in general, and with which researchers of ostensibly paranormal abilities have to engage, are (1) balancing experimental control with ecological validity and (2) lack of replication. The described project utilizes a novel technology, namely immersive virtual reality (IVR), as a research tool to overcome some of these difficulties. We argue that IVR has a number of features which make it well suited for the study of telepathy, including a higher degree of experimental control whilst also maintaining a relatively high degree of mundane realism (and consequently providing the opportunity for more ‘natural’ experimental trials), the co-location of senders and receivers, and the possibility of replication studies.

Project Background and Conception

Our intention here is to give an indication of the previous research literature (rather than an exhaustive review) on telepathy and general extrasensory perception (GESP), along with some of the problems which emerge in research on this topic. To this end we present literature which demonstrates well, some of the themes which emerge in the broader empirical research on telepathy and the demonstration of psi. (We take here Smith's (2003; p.69) definition of 'psi' "to refer to apparently anomalous processes of information transfer".) We will avoid here a discussion of the problems in distinguishing telepathy from other possible explanations of psi phenomena, such as clairvoyance and precognition - although these issues would be addressed in any research outputs (see Broughton (2002) for a discussion). We will conclude with a description of Immersive Virtual Reality and briefly outline the advantages that this technology poses for research into telepathy before detailing the research project.

Previous telepathy research

One promising line of research to emerge recently in regards to telepathy is that of 'telephone telepathy'. Sheldrake and Smart (2003) conducted an experiment on telephone telepathy with senders and receivers located several miles apart. Participants (n=4) were required to guess who was calling (from four potential callers) each time the telephone began ringing. In 271 trials conducted 45% of guesses were correct (25% were expected by chance); this rose to 61% when the caller was familiar, and dipped to 20% when unfamiliar (although a response bias was evident - see Schmidt, Muller, and Walach, 2003 for a critique, and Sheldrake, 2003, for a reply). In a subsequent study on telephone telepathy Lobach and Bierman (2004) found the emotional bond between participants and persons making the telephone calls to be positively correlated with correct guessing for five of six participants.

In a recent study Schmidt, Muller and Walach (2004) failed to replicate the findings of Sheldrake and Smart. One possible reason for this (amongst several) provided by the authors is that their own experiment took place in a room provided by the experimenters rather than in participants' homes as in the study by Sheldrake and Smart (2003). Schmidt et al. suggest that this change may mean that the phenomenon takes place in more 'natural' conditions (such as participants' own homes) and not under more 'artificial' conditions (such as the unfamiliar experimenter's room).

A study by Sanders, Thalbourne and Delin (2000) is similar to a number of studies which although failing to find a 'hit' rate above chance, do find higher rates of success to be related to a number of variables. In Sanders et al.'s study, 88 subjects aged 18-52 years old took part. Senders were required to "transmit" one of four different emotional states or names (excitement, serenity, anger, or fear) to a Receiver in an adjacent room. The sender/receiver roles were then reversed. Each subject completed 30 trials as sender and 30 as Receiver. Level of hitting did not deviate significantly from chance, but the Senders' transliminality scores (defined as "susceptibility to, and awareness of, large volumes of imagery, ideation and affect - these phenomena being generated by subliminal, supraliminal and/or external input") were significantly and positively related to hit-rate. Similarly, the Receivers' confidence of response and the sureness of abilities of both Senders and Receivers were significantly and positively related to level of hitting.

The possibility of mind-reading in intimate relationships has been examined by Thomas and Fletcher (2003). Their experiment involved perceivers carrying out mind-reading tasks of multiple targets at different levels of acquaintanceship (50 dating couples, friends of the dating partners, and strangers). They found that mind-reading accuracy was (a) higher as a function of increased acquaintanceship, b) relatively unaffected by target effects, (c) influenced by individual differences in perceivers' ability, and (d) higher for female than male perceivers. The authors concluded that the nature of the relationship between the perceiver and the target occupies a pivotal role in determining mind-reading accuracy.

As Bem, Palmer and Broughton (2001) note, "The existence of psi-anomalous processes of information transfer such as telepathy…continues to be controversial." Indeed, Rhine (1974) wrote of telepathy as an "untestable hypothesis", and advocated that research on telepathy "be indefinitely shelved until a conclusive test design is discovered." However, some researchers have found support for the existence of telepathy, with much of this evidence coming from ganzfeld studies.

The ganzfeld has become the most favoured and successful experimental method for the assessment of general ESP performance, such as telepathy, in modern parapsychology (Bem, 1993; Milton, 1999). This method is comprised of three stages, the preparation period, the sending and receiving period and the judging stage. The procedure involves a telepathy 'sender' and 'receiver'. The Receiver sits and relaxes in a reclining chair in a room, which is acoustically isolated or sound-attenuated. Translucent halved ping-pong balls are then taped over the Receiver's eyes (which are kept open during the session) and a light directed toward the eyes to create a uniform field of unpatterned vision. The visual field in the ganzfeld is red in the majority of the ganzfeld literature (e.g., Avant 1965; Bertini et al., 1964; Honorton & Harper, 1974) although some researchers employ other colours (usually white light, e.g. Braud et al., 1975). Headphones are placed over the ears through which the Receiver usually hears white noise, which produces a homogenous auditory field.

Prior to hearing white noise, the Receiver typically listens to a series of progressive relaxation instructions, which are employed to further reduce internal somatic "noise". The Sender is located in a separate room, which is also acoustically isolated. The role of the Sender is to concentrate on a target (often a visual stimulus) which has been randomly selected from a large pool of such stimuli. The Receiver is encouraged to provide a continuous verbal account of any mental imagery and thoughts experienced during the 'sending period'. This lasts for about half an hour, after which time there is a review of the imagery experienced during the sending period, followed by the judging stage. Here, the Receiver is presented with a choice of usually four stimuli, one of which is the target. The stimuli are arranged into four orthogonal sets. Without knowing the identity of the target, the Receiver is then asked to rate the degree to which each of the four stimuli matches the imagery and mentation experienced during the ganzfeld period. In some experimental designs, independent judges address the similarity between the target and the imagery of the Receiver (Milton, 1991). A 'hit' is scored if the Receiver assigns the highest rating to the target stimulus (Bem & Honorton, 1994). ESP or an anomaly ('psi') is inferred from performance (the number of correct identifications of the 'target' or hits), which is significantly above what would be expected by just guessing, chance (or below chance in psi-missing).

The current climate in parapsychology is one of an interim phase of self-assessment and evaluation regarding the future of the ganzfeld. This is in the wake of the publication of a meta-analysis of the results of recent ganzfeld experiments that found a null overall effect size in terms of ESP performance (Milton & Wiseman, 1997; 1999). Meta-analysis is a tool for statistically synthesising large bodies of work to ascertain the true level of the replicability of an effect (Utts, 1991). It is a means of addressing a database in a way that does not simply add up the number of statistically significant outcomes, but considers the effect size (a measure of the outcome of a study which also incorporates sample size and the power of a study). The Milton and Wiseman (1997; 1999) findings challenge the results of several previous, meta-analyses undertaken on ganzfeld studies which yielded significant outcomes (Bem & Honorton, 1994; Honorton, 1985; Hyman, 1985; Radin, 1997), and they argue that there is not a replicable psi ganzfeld effect. Certain authors conclude that there is a real effect (e.g., Navarro and Lawrence, 2002; Storm and Ertel, 2002) while others continue to assert that there is no real effect (e.g., Milton & Wiseman, 2002). (It should be noted here that there is considerable debate on the role of experimenter effects in facilitating or inhibiting performance in psi-related tasks. For example, see Wiseman & Schlitz, 1997, 1999; and Watt & Ramakers, 2003).

Parker (2003) suggests that the ganzfeld controversy is currently unresolved and any resolution is difficult due to the unacceptability of the phenomena to mainstream psychology. Palmer (2003), on the other hand, reviewed the literature and concluded that when one considers the entire ganzfeld database there is statistical evidence that the ganzfeld has provided good evidence for ESP. It may be that the effects could derive from normal sources, although critics of the field sometimes agree that normal explanations are implausible in accounting for the observed significant effects (e.g., Palmer, 2003).

Characteristics of targets in ESP research

Although it is often unclear whether the source of ESP is an aspect of the agent's mental processing of the target or some aspect of the target itself (Morris, 1978), some researchers have argued that the nature and the way that the target is experienced by the Sender should be considered in more detail in ESP investigations. ESP experiments vary in the extent to which an agent is active or passive; they may focus on the target material and try to communicate it to the percipient or they may be less actively oriented to the target material (Morris, 1978).

Target materials as employed in the ganzfeld for example have often been purely visual; most researchers have employed pictures or video clips, while some researchers have employed objects and geographical locations as targets (Milton, 1991). It has been suggested that psi-conducive targets are more dynamic and multi-sensory and may have a psychological impact on the Receiver (Delanoy, 1989). Target types have comprised both dynamic and static stimuli. Honorton et al. (1990) described dynamic targets as comprising films, documentaries and cartoons, while static targets are comprised of art-work, photographs and magazine advertisements.

Several authors have found a relationship between psi-hitting and aspects of the target. For example, Parker, et al. (1998) found a suggestive relationship between emotionality and effects of change in emotional tone of target material and psi-hitting (in line with May, Spottiswoode and James' findings regarding target entropy relating to psi, 1994). Dalkvist and Westerlund (1998) found a negative relationship between target emotionality and psi-hitting in a forced choice design. However, this was not replicated in a recent experiment (Dalkvist and Westerlund, 2004). Attempts to address the nature of a good target have demonstrated that there is a preference for dynamic target clips compared to static ones (Honorton et al, 1990), and a trend toward a preference for complex (colourful) target clips over simple (black and white) targets (Watt, 1996). These relate to perceptual-like and emotive experiences that are reported in the real world. It is of interest that real events and locations were successfully employed as target in the "remote viewing" experiments conducted by Targ and Puthoff and other researchers in the 1970's (c.f. Tart, Puthoff & Targ, 2000). The dream ESP series at Maimonides (e.g., Ullman, Krippner, &Vaughan, 1973) were also very successful in terms of ESP outcomes (see Sherwood & Roe (2003) for a review of dream ESP studies conducted since that time). It is of note that here the agent often attempted to act out aspects of the pictorial target material. The above literature suggests a need to develop and employ more realistic target material in future assessments of ESP in the laboratory, and to enhance the target experience for the Sender or to increase the reality of the target experience for the Receiver.

What the brief review above highlights is that:

1. An overall above-chance effect is generally not found in studies on telepathy (providing support for the arguments that either telepathic ability is not normally distributed in the population, or that telepathy does not exist), *although this is a source of debate in relation to the body of ganzfeld research*;
2. A number of psychological variables or characteristics do appear significantly correlated with the likelihood that a person will be successful in a telepathy task (providing support for the argument that there is a subset of individuals in the population with telepathic ability);
3. Actual and perceived characteristics of the experimenter are indicative of the likelihood that a significant effect will be observed in experiments in a GESP experiment.
4. The experimental environment may have the potential to increase or decrease the likelihood that telepathy will be demonstrated.
5. Aspects of the target seem important in the 'success' of some ganzfeld studies; more complex target material tends to play an important role.

Problems with research on telepathy

The research described here is built upon a particular problem which can be identified with telepathy research and one which until relatively recently was impossible to overcome: namely, the dislocation of Sender (S) and Receiver (R). In extant research S and R are separated by physical space, be they separate rooms or buildings in a research institution, or in their own homes several miles apart. S is required to try and transmit some information (a name, a picture, an emotion, etc.) and R is required to identify the target from a pool of possible targets. If over the experimental period the number of correct 'guesses' is above chance then this is interpreted as support for the possibility of telepathy, ESP, or psi.

Much experimental research in psychology involves methodological choices about experimental control and ecological validity. Concern with the former arises from the importance placed on the precise manipulation of independent variables, while the latter emerges from an emphasis for experiments to approximate as close as possible situations which are experienced in day-to-day life (Aronson and Carlsmith, 1969). Optimal experimental designs which seek to control extraneous variables usually involve laboratory environments and stimuli which are simple and 'unrealistic'. This is because as the complexity of the experimental environment and stimuli increase the experimenter finds it more difficult to conduct precise manipulations of independent variables and to control extraneous variables.

However, one reason for inculcating ecological validity or mundane realism in experiments is to aid participants' full engagement within experimental situations and to increase their sensitivity to manipulations of independent variables (see Korn, 1997)[1], and as a consequence increase the degree to which such manipulations affect participants as intended. However, one drawback of increasing mundane realism in experimental psychology is that this is accompanied by a loss of experimental control.

In many areas of psychology, such as social psychology, researchers are increasingly turning towards field studies at the expense of control. The experimental procedure has been argued to interfere with such abilities as telepathy, particularly as it presents an unnatural technique for demonstrating this ability; telepathy is often experienced in a spontaneous and less 'clinical' manner. However, within psychology in general, laboratory studies, with their associated sense of control, continue to hold much more respect and prestige. This is particularly important for studies of psi, which academia in general and psychology in particular regards as 'unacceptable' and for whom only the consistent replicability of an effect would sway their opinion.

One way in which the unnaturalness of the experimental laboratory may be alleviated would be if S and R could experience the same environment within which the target is located. If they were allowed to interact with the target pool (such as a book, a vase, or a chair) this might also facilitate both the acts of sending and receiving. This would also go some way to addressing some of the problems with telepathy research identified by researchers such as Braud (1982), who argued against a purely visual transfer model of telepathy. This move to more complex (on a number of levels) target material would also seem supported by the literature reviewed earlier (e.g. Honorton et al., 1990; Watt, 1996). Personal handling of target pool objects by both S and R might be expected to add other aspects to the telepathic communication process usually absent in the methodological design of research on this topic[2]. As the relationship between S, R and the target pool objects becomes more interactive this might facilitate the transfer of emotions, meanings and experiences that better convey what these are. An object which can be handled might be expected to make accessible the personal meanings, purposes of use, and so on, of the object for S and R than might possibly be achieved via a static (or even moving) image or written name (which are more commonly used in telepathy research studies).[3]

However, there are a number of difficulties with the above proposal. First, having both S and R in the same place and time as when the target is available introduces the possibility of fraud and sensory leakage. R could enter the room after S has left, but this still allows the possibility of fraud, and has the added drawback of the temporal separation of S and R's involvement in the experimental trial. These problems may seem insurmountable; however we believe recent technological advances provide a remedy for these problems. Such a technological advance is Immersive Virtual Reality.

[1] Fox (2005) notes that it is an assumption that participants are actually 'participating' in ganzfeld experiments, at least in the manner desired by the experimenter and what might be most conducive to demonstrating psi effects. We would add here that there is a need to make the task stimulating and engaging for both Sender and Receiver in order to maximise such participation.

[2] Though note participants attempts to act out pictorial aspects of target material in remote viewing studies discussed earlier.

[3] Such a view would find support from work in ecological psychology, particular Gibson's (1986) work on optical flow and affordances.

Immersive virtual reality and its potential for telepathy research

Virtual reality (VR) denotes the use of three-dimensional computer graphics technology to generate artificial environments that afford real-time interaction and exploration. These are intended to give the user an impression of being present or immersed in a computer-generated world. Such worlds are often very different from the habitual physical world, and may be governed by different programmable laws than physical reality (for instance gravity and embodied capabilities are often manipulated). While virtual environments can be presented on desktop computer displays, a sense of immersion is often promoted through the use of head mounted displays (HMDs, see Figure 1). These can present stereo images and sound, combined with haptic and vestibular displays, to create a perceptually encompassing computer environment. A sense of 'presence' or telepresence (presence-at-a-distance), of feeling 'there' in a virtual environment is, perhaps, the ultimate aim of VR research. This calls for a dampening of awareness in 'reality' and a heightened 'acceptance' of the surrounding virtuality (Sheridan, 1992).

Researchers of ostensibly paranormal abilities have been at the forefront in embracing and incorporating into their research the developments and increased sophistication in technology (see Broughton (1993) for example). One example of this is the testing of general extrasensory perception (GESP) which began using Zener cards, then photographs, video, and more recently computers and digital ganzfeld. Such technological developments have aided researchers in increasing mundane realism while minimising the negative impact to experimental control. Immersive Virtual Reality (IVR) has been documented as providing participants with a compelling sense of personal, social, and environmental presence (Witmer & Singer, 1998). Blascovitch et al. (2002) outline how the use of IVR in experimental psychology circumvents a considerable amount of the problem involved in making choices about control versus mundane realism. The researcher gains optimal control over the experimental environment and actions that take place within it, while increasing the mundane realism of the experiment and the full engagement of the participant.

In support of the use of virtual environments for facilitating ESP performance, the environment around the target has often served as part of the target, even if this was not intended by the experimenter (Morris, 1978). This implies that the mind of the Receiver may seek to put the target into the wider context, e.g., of the room in which the target material is being played/viewed. Real world ESP experiences often involve an event which occurs for one person (the agent) which is then experienced in some form by another person (the percipient). These experiences are often meaningful or emotionally affective to the percipient and agent (c.f. Irwin, 1999). In modern ESP experiments free response methods have been adopted to increase the level of ecological validity with regard to every day psi experiences. However, target materials still seem somewhat limited and may not often accurately mimic real world ESP. IVR, with its dynamic, three-dimensional representation of stimuli which can be handled by both Sender (S) and Receiver (R) in identical virtual environments, would seem to offer an opportunity to address these issues.

Immersive Virtual Reality and Replication in telepathy studies

The issue of replication is a pervasive problem in psychology research in general, with many journals uninterested in publishing replication studies, particularly when there is a failure to replicate (the so-called 'file drawer problem', Rosenthal, 1979). Researchers and publication outlets in the field of parapsychology and psychical research have been more open to this problem, in part due to the stronger application of the principles of reliability and validity often placed on such research by critics, and replication attempts are more commonly reported.

Here we want to consider an issue relating to replicability, particularly in relation to research on telepathy, which the proposed research is intended, in part, to address. The replicability of experimental findings has been viewed by many researchers of psi as an important goal in establishing parapsychology as a 'legitimate' avenue of scientific inquiry (e.g., Shapin & Coly, 1985; Utts, 1991). One reason why replication studies in many areas of psychology are not attempted is due to the difficulties that interested researchers have in using and carrying out the same methods and procedures as (detailed by) other researchers. Researchers of ostensibly paranormal abilities in particular have stressed the need to report such details as fully as possible, and this has aided attempts to replicate significant findings. However, even when researchers provide informationally rich and accurate descriptions these attempts are hampered by such problems as differences between the physical properties (size, colour, and so on) of researchers' physical laboratories

Replicability, one of the hallmarks of a science, remains an issue as there are inconsistencies in the effect sizes found across experimenters and laboratories. This weak level of replicability leaves parapsychology open to criticism from the wider scientific community. Where experimenters follow Honorton's original recipe for a standard ganzfeld, there are better results in terms of ESP performance (Bem, Palmer & Broughton, 2003). However, one reason sometimes advanced for the failure to replicate statistically significant parapsychology studies is that replication studies sometimes omit important procedural features which are present in studies showing significant findings.

With the use of IVR in experimental psychology the possibility of replications or 'near-perfect' replications increases (Blascovitch, et al., 2002). Because software is 'portable' and the necessary hardware can be easily purchased, identical experimental situations and procedures can be shared with ease. Virtual environments can be easily shared between researchers and across laboratories, increasing the opportunity for both cross-sectional replication and for more representative sampling (Blascovitch, et al., 2002). This means that experiments can be carried out concurrently in multiple networked laboratories. While the research project described here does not present an immediate solution to the above problem, it does advance a technology which in the long term we argue will become a pervasive research tool in experimental psychology in the near-future, and which presents researchers interested in the scientific study of ostensibly paranormal abilities in particular with techniques to overcome some of the inherent limitations associated with conducting this work. Blascovitch et al. (2002) argue that, just as the increasing proliferation of the Internet provides new opportunities for on-line research with demographically documented sampling frames, as IVR technology migrates from academic and entertainment contexts into the home, the possibility of conducting experiments on participants who are representative of the populations to which researchers wish to generalise their findings will also increase.

To briefly summarise, the advantages that we believe IVR offers to researchers of ostensibly paranormal abilities or psi include the optimisation of control and mundane realism, the fuller interest and engagement of participants, the possibility for replicable studies, and the enhancement of target stimuli for optimal effect. In the following section of this paper we provide technical details of the TIVE.

IMMERSIVE VIRTUAL TELEPATHY SET-UP

Physical Spatial Arrangements

Our current study employing the TIVE takes place in two rooms in Coupland 1 Building, Division of Psychology, University of Manchester, arbitrarily called 'Study Room A' and 'Study Room B'. Room A is always the Sender's (S) room, and room B is always the Receiver's (R) room. (The possibility of sensory leakage is minimized as these rooms are approximately 150 feet apart, on different floors, and have 7 doors in between them.)

Immersive Virtual Reality Equipment

A V6 stereoscopic head-mounted display (HMD) is used to transmit the visual elements of the virtual environment to the participants [http://www.virtualresearch.com/techV6.htm]. This has a 640 x 480 (307,200 colour elements) pixel resolution per eye, and a 60° diagonal field-of-view. The participant is able to 'look around' the IVR by making corresponding movements of their physical head. The Sender (S) hears the sound made by objects via an in-ear phone (left-ear). They are also able to hear (with their right ear) the spoken mentation of R via speakers placed close by. The Receiver (R) hears the sound made by objects via headphones built in to the V6.

The physical interaction of participants within the IVR is achieved via the use of an instrumented glove which allows the 'handling' of virtual objects. The system currently in use employs a 5DT-14 wireless lycra dataglove [http://www.5dt.com]. The glove facilitates the measurement of finger flexure (2 sensors per finger) as well as the abduction between fingers. This enables participants to interact with virtual objects but does not provide tactile or haptic feedback. A sensor attached to an elasticated band is placed around the wrist, and one around the elbow. A third sensor is attached to the top of the HMD. A Polhemus cube is placed on a tripod approximately 11/2 feet in front of the participant. This device relays the information received from all three sensors to a Polhemus Fastrak box which translates them into corresponding movements of the participant's virtual body in the virtual environment.

The Polhemus Fastrak contains some hardware filters to stabilize the positions and orientations of the sensors. However, in some circumstances like magnetic interferences, some jitters can appear which is detrimental to any experiment. Therefore, we have added the software "Infinite Response Filter" to the sensors, which has the effect of smoothing the input data. The latency associated with any kind of filtering is here reduced by smoothing over the two previous frames only.

Calibration becomes an important issue when establishing a link between the virtual and the real world. By default, the Polhemus sensors are not calibrated at all, and any magnetic interference has the effect of distorting the readings. Calibration has then to be achieved in the software, using some known correspondences between the real and the virtual world. In a calibration step, the sensors are placed consecutively at a series of known locations. The program then records their locations as given by the Polhemus Fastrak, and computes the correspondence function. Other locations are interpolated, which means that the matching between real and virtual world could not be equally accurate everywhere.

Construction of the Virtual Body Representation

The positions of the sensors are used to control a model of the human body. The kinematic model is a tree of joints and bones which defines the pose of the model, as opposed to its appearance (colours, etc.). Each joint of the model is then defined relatively to the previous joint in the tree. For example, the position of the forearm is defined relatively to the arm. The only free parameters are then the relative rotation angles of the joints. After a careful parameterization avoiding singularities, the joint angles encode the pose of the body. The transformation between joint angles and global positions is efficiently implemented using quaternions.

Placing constraints on the joint angles allows impossible poses to be avoided. The appearance of the body is modelled by a polygonal mesh, attached onto the underlying kinematic model. At each frame, the coordinates of the polygons constituting the mesh are then updated to reflect the movements of the kinematic model. In order to model properly deformable joints, the skin mesh cannot be rigid, but has to be deformable and influenced by more than one joint. We use a technique called "Mesh-Skinning", which allows a vertex of the skin mesh to be influenced by an arbitrary number of kinematic joints. The position and the normal of a given vertex are then computed as a weighted sum of their values as if it was attached solely to one kinematic joint at a time. This technique is sufficiently simple for real-time computations, but nonetheless gives realistic results.

Immersive Virtual Reality Environment

A virtual reality environment has been created for use in this project. The environment itself resembles a virtual room containing four walls, ceiling, floor, a potted plant, a door, two windows, and a wall mounted shelving system, similar in appearance to a bookshelf. The operator is free to turn around and take in a 360^0 view of the room. They are able to see their virtual body in a similar fashion to the way we see our own real bodies, i.e. arms, legs and parts of the torso, but are unable, for instance, see their own face, head or back. Movement is restricted within the environment to motions that only serve the purpose of the experiment. So, a person may move their arms and fingers and legs, but they cannot 'virtually walk' anywhere around the room. The target objects appear in the virtual room on the shelving mentioned above. Targets are selected from the shelf via a gesture of the hand (the participant bends their thumb in towards the palm of the hand) that the equipment registers as a selecting gesture (this will described in more detail in the procedure section). When an object is selected, it moves from the shelf and affixes itself to the participant's virtual hand. They are then free to interact with the object (more details of this will be described in the procedure section) (see Figure 1). It must be clearly noted that at no time is the Sender or the Receiver able to see their experimental partner's virtual body in the room with them. Essentially, although the environment they inhabit is identical in nearly all respects, it should be viewed and treated as two separate rooms.

Fig. 1 A Sender (above left) and Receiver (below left) using the demonstration set in the Telepathy Immersive Virtual Environment.

Computer Equipment and Set-up

The experimental set-up is identical for both the Sender and Receiver, in their respective rooms, as follows. For each participant we use two computers. The first is a small-form-factor "XPC" from Shuttle Inc. [www.shuttle.com] with a 1.4GHz CPU and 512Mb of memory, running Ubuntu Linux [www.ubuntu.com]. This computer hosts the V6 stereoscopic head-mounted display, computer monitor, Polhemus Fastrack and the data-glove.

The software running on the Shuttle was designed and implemented by the authors for this project. The software uses C++ for logic and control, OpenGL for graphics [www.opengl.org], and OpenAL for sound management [www.openal.org]. The software communicates with the identical Shuttle in the other (Receiver's) room using a standard Internet "socket" library, connecting with the other Shuttle via a standard ethernet (Internet) connection. This receives instructions from the Sender's computer /software. Similar to the master computer, real time actions in the virtual world are displayed on computer's monitor, again enabling the experimenter to view and record what is happening.

The Sender's first computer governs the selection and randomization of target pools, sets and objects. It also governs the presentation of objects during the judging phase. We base the random selection of objects on the standard Unix/C system function "rand", which returns an integer selected from a pseudo-random sequence initialized the system called srand(seed) which is seeded with the current system time (in milliseconds) at which the software was started. Thus for every run of the system (i.e., for every trial) a completely different pseudo-random sequence is guaranteed.

The second computer in each participant room is a standard office PC running Windows XP. This computer hosts the Skype voice-over-IP telephony software [www.skype.com] which enables the Sender to hear the mentations of the Receiver (via a microphone), via Skype also running on the PC in the Receiver's room. In the original experimental design, we intended Skype to run on the Shuttles, but during system testing we found that this was not technically possible, because the Skype software "locked" the Shuttle's soundcard, preventing the OpenAL software from functioning and producing the sounds associated with each object. A solution to this problem was not achievable within the project timescale, and thus led to the deployment of the additional PC to host the Skype software. The experimenters are also able to communicate with one another using the text 'chat' function of Skype. This allows the experimenters to synchronize activities, such as when Experimenter 1 (with the Receiver) signals that they are stopping the trial and beginning the judging procedure (during which the Sender's speakers are turned off by Experimenter 2). After each completed study the record of each Skype session, containing the dialogue between experimenters, is saved for future reference.

In order to translate participant gestures into commands in the virtual environment we wrote software to recognize two simple glove gestures only: the recognition of a movement of the thumb into the open palm (to select an object from the virtual shelf), and the recognition of a fully closed palm (a fist, to replace an object back on the virtual shelf). In order to cater for differing hand and finger sizes among subjects, we provided a simple "sensitivity" control (see Figure 2) which the experimenter could use to adapt the software to the participant, and such adaptations were made before the start of the experiment proper. The Graphical User Interface (shown in Figure 2) allows the Sender's experimenter to input a participant-pair ID, to stipulate their participant is the Sender (in the Receiver's room the experimenter would just check the Receiver role option, then press start), and to select the object set. We also have options to change the coloring of participants clothing as it appears on the virtual body, along with the length of their sleeves and their skin color. In our present work the default settings indicated in Figure 2 are used.

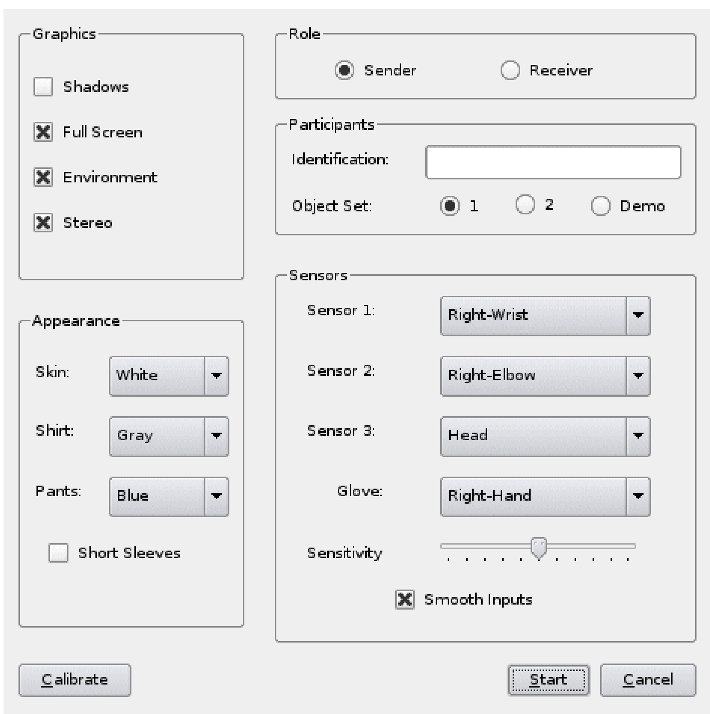

Fig. 3 The Graphical User Interface for the Telepathy Immersive Virtual Reality Environment.

Target Pools and Objects

One demonstration set (comprised of four doors) and two separate target pools (in total comprising of eight different sets and a total of thirty-two objects) have been generated especially for this project, one pool for Study 1 and the other for Study 2. In order to familiarize participants with the experimental procedure, and the procedures for selecting and de-selecting objects, S and R first see a demonstration set. This is a set of four doors, with different colours, and different knocking or bell-ring sounds. For Study 1 there are four sets of four objects which collectively make up the target pool for study 1, making a total number of 16 objects. For Study 2 a second target pool consisting of another four sets is used. Each set contains four objects that are entirely different from the objects in the four sets used in study 1. Again, each object has its own associated sound, making a total number of 16 objects in use in Study 2.

The TIVE System in Use

Before the experiment begins, both participants receive a set of verbal, standardized instructions about what they have to do in this part of the experiment. Both S and R are asked to put on the head-mounted display and instrumented glove. The equipment is adjusted to the participant's comfort and calibrated in order to ensure that the instrumented glove can pick up the necessary gestures required to select objects (described in detail later).

In each room S and R first experience the demonstration set. During this time there is a two-way audio link between the Sender and Receiver rooms. Once participants feel comfortable with the task and equipment the microphone in the Sender's room is physically disconnected for the remainder of the study. Study 1 then formerly begins. The Sender's computer selects one of the four object sets randomly from the study 1 target pool. It then presents the four objects in the chosen set in random order on the virtual shelf in each of the virtual environments (the same random order in each environment). In the Sender's environment, they see one object which is randomly selected as the target from the object set, and three square opaque panels. The placement of the target object and panels is randomized. In the Receiver's environment they initially see four square opaque panels. These panels hide the objects from the view of both participants. Prior to the trial the Sender is briefed that, once the target object has been presented, they should then focus their attentions on the target and ignore the three remaining objects on the shelf, which shall remain hidden. This method is intended to minimize contamination of the Sender's thoughts by visual experience of the other objects on the virtual shelf (however, they can hear the Receiver's verbal description of these objects if they choose to provide them). In order to facilitate a more complete focusing of attention on the target object, the Sender is free to explore the object by pointing at it and making a gesture with the hand that the instrumented glove interprets as a selecting action. The object then comes off the shelf and affixes itself to the Sender's virtual hand. At the same time an associated sound is played through the headset headphones on a loop for as long as the Sender manipulates the object. The Sender is then free to interact with the object, turning it around, looking at it from different angles, and is able to carry out object-specific actions. For instance, if the object was a cup, then the Sender can simulate drinking motions by lifting the cup up to the mouth. When the Sender is finished with the object they are able to perform a gesture (making a fist) which returns it to the virtual shelf.

Concurrently, in the Receiver's virtual environment, the participant is free to explore all four objects in the same fashion as the Sender. By pointing at one of the opaque panels and making a selection gesture, the partition disappears and the object comes into view on the shelf before traveling and becoming fixed to R's hand. Whichever object the Receiver chooses to interact with, the relevant associated sound is played through the headset headphones on a loop for as long as the Receiver manipulates the object. When the Receiver is finished with an object they perform a (fist) gesture which returns it to the virtual shelf and replaces the opaque panel. They can then select another object using the same procedure as before.

Throughout the trial period the Sender concentrates upon the target object whilst the Receiver is able to manipulate any of the objects as they choose. Both participants are encouraged to verbalize their impressions, feelings and thoughts as they try to send and receive respectively. A one-way audio connection between the Sender and the Receiver allows the Sender to hear the Receiver's spoken aloud mentation. This provides the Sender with real time feedback on how well (or not) they are performing. As the set up is one-way, the Receiver is not able to hear anything the Sender is saying.

At the end of the first trial Experimenter 1 (with the Receiver) signals to Experimenter 2 that they are stopping the trial using the text 'chat' function of Skype. Experimenter 2 then switches off the speakers in the Sender's room and quits the Telepathy Virtual Environment. Judging in the Receiver's room does not begin until the Experimenter has received confirmation via the Skype chat facility that the speakers in the Sender's room are switched off. The Sender is then free to remove their HMD and signs a sheet to confirm what the target object was. The Receiver, however, keeps their HMD on whilst they carry out the judging procedure. During this procedure the experimenter presses a 'reveal' function on the keyboard and the Receiver is able to see all four objects simultaneously in the order they appeared on the shelf. First, the Receiver is asked to indicate whether they feel that there are any items which are definitely not the target (they may choose between 0-3 of the items). The Receiver is then asked to rate each object in terms of how much they feel each object is the target. This is expressed as a percentage (0-100) for each object. Receivers are asked not to duplicate their confidence ratings (they give a different numerical rating for each object), which the experimenter writes onto the judging sheet (with each object having a unique rating). These confidence ratings are then used to derive ranks for each object.). Once the judging procedure is complete, the Receiver removes their HMD and completes the first of their Presence questionnaires. The experimenter with the Receiver then confirms with R what their first choice is before relaying this to the second experimenter in the Sender's room using the Chat facility in Skype. This information is given to the Sender, and the actual target object is relayed back to the first experimenter in the Receiver's room who relays this to R.

Following Trial 1, the Sender and Receiver reverse roles and perform the second trial. For the current project S and R swap physical locations (However, it is possible to reverse the roles by having the computer in room B make the pool and object selections instead of that in room A). S and R first meet approximately half-way, where they stop and chat with the experimenters about their performance before participant's swap experimenters and rooms. The second trial is essentially the same as the first trial; with the exception that this time the Sender's computer randomly chooses the second object set from the three remaining sets in the study 1 target pool (i.e. the set chosen for use in the first trial will not be available for selection). Following this, participants re-don their HMDs and the second trial begins. The randomization of the order of presentation of objects in the virtual environment and the procedure for selection and manipulation of those objects are all the same as for the first trial. Again, both participants are encouraged to verbalize their impressions, feelings and thoughts as they try to send and receive respectively. However, this is particularly stressed to the Receiver who is aware that the Sender can hear them viia the audio link. At the end of the second trial, the Sender removes their HMD and completes the second of their presence questionnaires. The judging process for the Receiver is the same procedure as for trial 1. The process of relaying R's choice and the identity of the actual target is the same as in Trial 1.

SUMMARY AND FUTURE DIRECTIONS

Within this paper we have described the design and implementation of an immersive virtual environment for the study of telepathy. We have described the particular advantages that this method has over traditional methods for the study of general extrasensory perception. These include the optimisation of control and mundane realism, the fuller interest and engagement of participants, the possibility for replicable studies, and the enhancement of target stimuli for optimal effect.

There are, however, further improvements which we hope to implement in future work. First, we intend to integrate the audio relaying the Receiver's comments with the sounds elicited by the virtual objects in the HMD earphones of the Sender, thus negating the need for speakers during the trial. Second, we intend to incorporate the judging procedure into the software of the IVE, so that participants responses can be recorded akin to how such responses are recorded in autoganzfeld studies (although we believe the current procedures are as sufficient in guarding against human error in recording responses and experimenter fraud). Third, we intend to use animated virtual objects (i.e. objects which have moving parts or parts which can respond to interaction by the participant) to supplement the static (though interactionally available) objects in our present work. In future work we hope to be able to collaborate with other parapsychology laboratories in order to explore issues of replication and experimenter effects.

ACKNOWLEDGEMENTS

We would like to thank the Bial Foundation (project number 135/04) for their financial support of this research. We would also like to thank two anonymous reviewers for their constructive comments on an earlier draft of this paper.

REFERENCES

Aronson, E. and Carlsmith, J.M. (1969) Experimentation in social psychology. In G. Lindzey and E. Aronson (Eds.) *Handbook of Social Psychology* (3rd ed) New York: Random House. (p.1-46)

Avant, L. L. (1965) Vision in the ganzfeld. *Psychological Bulletin, 64 (4),* 246-258.

Bem, D.J. (1993) The Ganzfeld experiment. *Journal of Parapsychology, 57(2),* 101-110.

Bem, D. J. and Honorton, C. (1994) Does psi exist? Replicable evidence for an anomalous process of information transfer. *Psychological Bulletin, 115,* (1), 4-18.

Bem, D. J., Palmer, J. and Broughton, R. S. (2001) Updating the ganzfeld database: A victim of its own success? *Journal of Parapsychology, 65,* 207-218.

Bertini, M., Lewis, H. B. and Witkin, H. A. (1964) Some preliminary observations with an experiment procedure for the study of hypnagogic and related phenomena. In C.T. Tart (Ed.), *Altered states of consciousness: A book of readings*, (pp. 93-115) (3rd Edition) San Franscisco: Harper.

Blascovich, J., Loomis, J., Beall, A.C., Swinth, K.R., Hoyt, C.L. and Bailenson, J.N. (2002) Immersive virtual environment technology as a methodological tool for social psychology. *Psychological Inquiry, 13(2),* 103-124

Braud, W. (1982) Nonevident PSI. *Parapsychology Review, 13(6),* pp. 16-18.

Broughton, R. (1993) A craftsman and his tools: The new technology. *The Journal of Parapsychology,* 57(2), 111-127.

Broughton, R. (2002) Telepathy: Revisiting its roots. In the 4th Symposium of the Bial Foundation: *Behind and Beyond the Brain*. (Pp.131-146). Bial Foundation: Porto, Portugal.

Dalkvist, J. and Westerlund, J. (1998) Five experiments on telepathic communication of emotions. *Journal of Parapsychology, 62,* 219-253.

Dalton, K. and Utts, J. (1995) Sex pairings, target type and geomagnetism in the PRL automated ganzfeld series. In *Proceedings of Presented Papers from the 38th Parapsychological Association Annual Convention* (pp. 99-112

da Silva, F. E., Pilato, S. and Hiraoka, R. (2003) Ganzfeld vs. no ganzfeld: An exploratory study of the effects of ganzfeld conditions on ESP. *Proceedings of Presented Papers: The Parapsychological Association 46th Annual Convention,* (pp. 31-49)

Delanoy, D. L. (1988-1989) An examination of subject and agent mentation in the ganzfeld. *European Journal of Parapsychology, 7,* 135-168

Gibson, J. J. (1986). *The Ecological Approach to Visual Perception.* Hills-dale, NJ: Erlbaum. (Original work published 1979)

Honorton, C. (1985) Meta-analysis of psi ganzfeld research: A response to Hyman. *Journal of Parapsychology, 49,* 51-91.

Honorton, C.and Harper, S. (1974) Psi-mediated imagery and ideation in an experimental procedure for regulating perceptual input. *Journal of the American Society for Psychical Research, 68,* 156-168.

Honorton, C., Ramsey, M. and Caribbo, C. (1975) Experimenter effects in extrasensory perception. *Journal of the American Society for Psychical Research, 69,* 135-139.

Honorton, C., Berger, R., Varvoglis, M. P., Quant, M., Derr, P., Schechter, E.I., and Ferrari, D. C. (1990) Psi communication in the ganzfeld: Experiments with an automated testing system and a comparison with a meta-analysis of earlier studies. *Journal of Parapsychology, 54,* 99-139.

Hyman, R. (1985) The ganzfeld psi experiment: A critical appraisal. *Journal of Parapsychology, 49,* 3-49.

Irwin H. J. (1999) *An introduction to Parapsychology*. (3rd Edition) Jefferson NC: MacFarland and Company Inc.

Fox, J. (2005) Will we ever know if ESP exists? Paper presented at the *Developing Perspectives on Anomalous Experience Conference*, Liverpool Hope University College, Liverpool, United Kingdom. 4th June 2005.

Korn, J.H. (1997) *Illusions of Reality: A History of Deception in Social Psychology*. Albany: State University of New York Press.

Lobach, E. and Bierman, D. (2004) Who's calling at this hour? Local sidereal time and telephone telepathy. In S. Schmidt (ed.) *Proceedings of the Parapsychological Association, 47th Annual Convention* (Pp.91-98

May, E. C., Spottiswoode, S. J. P. and James, C. L. (1994) Shannon Entropy: A possible intrinsic target property. *Journal of Parapsychology, 58 (4),* 384-401.

Milton, J. (1991) Judgments on judging: A postal survey of experimenters' views on free-response matching. *Journal of the American Society for Psychical Research, 85 (1),* 1-24.

Milton, J. (1999) Should ganzfeld research continue to be crucial in the search for a replicable psi effect: Part I. Discussion paper and introduction to an electronic mail discussion. *Journal of Parapsychology, 63,* 309-333.

Milton, J. and Wiseman, R. (1997) Ganzfeld at the crossroads: A meta-analysis of the new generation of studies. In *Proceedings of Papers Presented at the Parapsychological Association 40th Annual Convention*, (Pp. 267-282).

Milton, J. and Wiseman, R. (1999) Does psi exist? Lack of replication of an anomalous process of information transfer. *Psychological Bulletin, 125 (4)*, 387-391.

Milton, J. and Wiseman, R. (2002) A response to Storm and Ertel (2002) *Journal of Parapsychology, 62*, 183-185.

Morris, R.L. (1978) A Survey of Methods and Issues in ESP Research. In Krippner, S. (Ed.), *Advances in Parapsychololological Research 2: Extrasensory Perception*. New York: Plenum Press

Murray, C.D., Simmonds, C. and Fox, J. (2005) Telepathy and telepresence in immersive virtual reality. *Proceedings of the Parapsychological Association, 48th Annual Convention*. (Pp.236-241).

Palmer, J. (2003) ESP in the ganzfeld: Analysis of a debate. *Journal of Consciousness Studies, 10,* 51-68.

Parker, A. (2003) We ask does psi exist? But is this the right question and do we really want an answer anyway? *Journal of Consciousness Studies, 10,* 111-134.

Parker, A., Grams, D. and Pettersson, C. (1998) Further variables relating to psi in the ganzfeld. *Journal of Parapsychology, 62,* 319-337.

Navarro, J. M. and Lawrence, A.R. (2002) Una revision critica de la evidencia experimental del fenomeno de percepcion extrasensorial: Aciertos y errors de un paradigma de monotizacion perceptive. *Apuntes de Psicologia, 20,* 97-118.

Radin, D. I. (1997) *The Conscious Universe. The Scientific Truth of Psychic Phenomena*. New York: HarperCollins.

Rhine, J. B. (1974) Telepathy and other untestable hypotheses. *Journal of Parapsychology, 38(2),* 137-153.

Richards, D.G. (1991) A study of the correlations between subjective psychic experiences and dissociative experiences. *Dissociation: Progress in the Dissociative Disorders, 4(2),* 83-91.

Rosenthal, R. (1979) The file drawer problem and tolerance of null results. *Psychological Bulletin, 86*, 638-641.

Sanders, R. E., Thalbourne, M.A. and Delin, P.S. (2000) Transliminality and the telepathic transmission of emotional states: An exploratory study. *Journal of the American Society for Psychical Research, 94(1-2),* 1-24.

Schmidt, S., Muller, S. and Walach, H. (2003) Videotaped experiments on telephone telepathy: Comment. *Journal of Parapsychology, 67(2),* 409-411.

Schmidt, S., Muller, S. and Walach, H. (2004) Do you know who is on the phone? Replication of an experiment on telephone telepathy. In S. Schmidt (ed.) *Proceedings of the Parapsychological Association, 47th Annual Convention* (Pp.245-254).

Shapin, B. and Coly, L. (Eds.) (1985) *The Repeatability Problem in Parapsychology*. New York: Parapsychology Foundation.

Sheldrake, R. (2003) Videotaped experiments on telephone telepathy: Reply. *Journal of Parapsychology, 67(2),* 411-414.

Sherwood, S.J. and Roe, C.A. (2003) A review of dream ESP studies conducted since the Maimonides Dream ESP programme. In J. Alcock, J. Burns and A. Freeman (Eds.) *Psi Wars: Getting to Grips With the Paranormal.* Exeter: Imprint Academic. (Pp. 85-109).

Smith, M.D. (2003) The role of the experimenter in parapsychological research. In J. Alcock, J. Burns and A. Freeman (Eds.) *Psi Wars: Getting to Grips With the Paranormal*. Exeter: Imprint Academic. (Pp. 69-83).

Storm, L. and Ertel, S. (2001) Does psi exist? Comments on Milton and Wiseman's (1999) meta-analysis of ganzfeld research. *Psychological Bulletin, 127,* 424-433.

Tart, C. T., Puthoff, H. E. and Targ, R. (2000) (Eds.) *Mind at Large: IEEE Symposia on the Nature of Extrasensory Perception*. Charlottesville, VA: Hampton Roads Publishing.

Thomas, G. and Fletcher, G.J.O. (2003) Mind-reading accuracy in intimate relationships: assessing the roles of the relationship, the target, and the judge. *Journal of Personality and Social Psychology, 85(6),* 1079-1094.

Ullman, M., Krippner, S. and Vaughan, A. (1973) *Dream Telepathy*. London: Turnstone Books.

Utts, J. (1991) Replication and meta-analysis in parapsychology. Statistical Science, 6, 363-378

Watt, C. A. (1996) What makes a good psi target? Three studies of forced-choice ESP varying target emotionality and complexity. *Journal of Parapsychology, 60(1)*, 25-42.

Watt, C. and Ramakers, P. (2003) Experimenter effects with a remote facilitation of attention focussing task: A study with multiple believer experimenters. *Journal of Parapsychology, 67*, 99-116.

Wiseman, R. and Schlitz, M. (1997) Experimenter effects and the remote detection of staring. *Journal of Parapsychology, 61*, 197-207.

Wiseman, R. and Schlitz, M. (1999). Experimenter effects and the remote detection of staring: An attempted replication. In K. Dalton (Ed.) Proceedings of the Parapsychological Association Annual Conference. *The Parapsychological Association 42nd Annual Convention Proceedings of Presented Papers*. (Pp. 471-479).

Wiseman, R., Smith, M. D., and Kornbrot, D. (1996). Exploring possible sender-to-experimenter acoustic leakage in the PRL autoganzfeld experiments. *Journal of Parapsychology, 60* (2), 97-128.

ANOMALOUS STRUCTURE IN GCP DATA: A FOCUS ON NEW YEAR'S EVE

Roger D. Nelson
Global Consciousness Project, Princeton, New Jersey, USA

ABSTRACT

Continuous parallel sequences of random data have been accumulated in the Global Consciousness Project (GCP) for eight years as of August 2006, and we have made formal hypothesis tests regarding potential structure in the data associated with each New Year transition during that time. The GCP maintains a network of about 65 active random event generator (REG) devices around the world, each recording 200-bit trial sums at one per second over months and years, and reporting them over the Internet to a central server. We have made two types of prediction for New Year's, one that the mean score across REGs in the network will depart from expectation, and another that the variance across devices will be reduced near midnight. The GCP data are signal averaged across all time zones, and the period surrounding midnight is assessed for each year. The meanshift measure combined across all eight years shows a substantial decline, but it is not statistically significant. The variance measure has a more impressive outcome: Analyses for individual years show results conforming to the hypothesis in about three fourths of the cases, and for the eight years combined, the shape of the signal averaged cumulative deviation is striking. Permutation analysis shows that the prediction of reduced variance is supported with a *p*-value of 0.026. While it is prudent to keep alternative explanations in mind, these results are *prima facie* evidence of a large-scale interaction of human consciousness that can have effects in the physical world, similar to those found in intention-based laboratory mind-machine experiments. The project continues, with a focus on refining hypotheses and assessing a broader range of potential correlates.

INTRODUCTION

The Global Consciousness Project (GCP) was created to assess possible correlations between special events in the world and measures of structure in random data (Nelson, 2001). A network of random event generators (REGs) placed around the world produces data continuously and sends them via the Internet for archiving on a central server, creating a database of random trial scores in synchronized parallel sequences. Given this unrolling matrix of unpredictable numbers, the original goal of the project was to test a general hypothesis that the data would show non-random structure or patterns at times when major events draw attention and focus from large numbers of people.

The project is an extrapolation of REG-based laboratory and field experiments which have shown effects that are taken as evidence of interactions of consciousness with physical systems. In the laboratory, the REG serves as a target of intentions to produce high or low outcomes relative to expectation. The results over several decades of controlled research show a small but significant positive correlation of outcome with the assigned intentions (Jahn, et al., 1997; Radin & Nelson, 1989). The field experiments use the same technology in non-intentional applications, collecting data in a variety of situations with groups of people. These "Field REG" experiments assess the character of REG data collected during periods of time when the group interactions are judged to be coherent or resonant. Data collected in such situations have consistently shown increased variance (Nelson, et al., 1996, 1998) indicating that even without explicit intentions, changes in the behavior of REG devices may be correlated with particular states of human consciousness.

The GCP is a global-scale extension of these experiments, embodied in a world-spanning network of REG devices. The nodes in the network are referred to as "eggs". Each egg consists of a physical REG and custom software to sample the output, create 200-bit trials at 1 Hz, and send the data over the Internet to the GCP server in Princeton, NJ. For the formal GCP experiment, the measures used and the hypotheses we pose are based on the laboratory and field research with REGs. We predict changes associated with operationally defined special states of "global consciousness". In practice this is implemented by specifying the beginning and end of a period of time associated with a major global event, along with the statistical procedures to be used for the hypothesis test. This design is replicated in a series of formally designated events, and the composite outcome of the accumulated trials is taken as the bottom line test of the general hypothesis.

Before we started collecting data in the newly established network in August 1998, we thought about what kinds of events bring people together in a widespread, shared focus of thought and emotion. An obvious candidate was the yearly celebration of New Year's. The transition from the old to the new is a focus point all around the world. Of course there are important "New Year" celebrations on different dates, the Chinese New Year, the Persian New Year, and various ceremonies to welcome spring, but the main one is December 31 going into January 1st. Even in parts of the world where there is another cultural New Year, much attention is paid to the midnight transition celebrated in New York's Times Square, in London, in Hong Kong, in Perth - practically everywhere there are people. It is a natural because one calendar is used everywhere, and because New Year's Eve is a grand party the world over.

In any case, as midnight approaches on December 31st, an unusually large proportion of humanity merges in a common engagement. Individualized interests and expectations are put on hold, replaced by a synchronized dance of participation. The same kind of widespread engagement may also develop when a terrible event occurs, especially if it is an unexpected, surprising, awful thing such as the terrorist attacks on September 11 2001 (Nelson, 2002; Nelson, et al. 2002). New Year's isn't like that, of course. On the contrary, it is anticipated, prepared for, even traditional. It is almost like the rituals of religious practice, though simpler and easier to share: just focused attention to a moment with no intrinsic importance or any deep meaning to distract us; an unusually relaxed, shared moment in time.

Given all that, New Year's is an ideal opportunity to consider collective consciousness in a relatively pure form. Brief and precisely focused, the moment draws widespread attention, and because there are few competing distractions, it is an unusually potent shared moment. Afterward we go back to the ordinary world, separating from each other and from the collaborative moment. This defines in operational terms what we call a "global event" which constitutes or produces a special state of communal consciousness that may register an effect on random event generators. The general hypothesis of the GCP is that we may find changes in the swath of REG data associated with such moments. That is, we hypothesize that an unusual state of relatively coherent, shared consciousness will produce a correlated signal in the GCP data.

Finally, we note that while we use the term "global consciousness", we do not presume that the anomalous effects are caused by a world-scale mind. Nor do we wish to claim that consciousness is necessarily the source of the effects. The GCP is empirical in nature, and the analyses we use address correlations. Much more work will need to be done to establish explanations or identify mechanisms.

METHODS

How the hypothesis is tested

What does it look like if we attempt to capture a signal in the sea of informational noise our minds create in the world? If we really do share emotions and thoughts, we might expect our common focus to produce a corresponding focus in a "field of consciousness" covering the earth with a sparkling, scattered layer of thought and feeling. Though they are normally random or unstructured relative to each other, our mental processes may sometimes resonate and become synchronized. Think of those mental sparkles as notes in all registers and rhythms, uncoordinated most of the time because there is no score or conductor. But when there is something special, a shock or surprise, a ritual or a celebration, then we might expect the sparkling to develop ripples and waves that put some structure into the chaos. Thinking in terms of sound, we can imagine the random tunings of an orchestra changing to music at the rap of the conductor's baton. To see whether there is an effect of focused consciousness on our data, we take the midnight transition to the New Year as a stimulus creating a coherent signal in an otherwise noisy background. Two independent calculations are made on the data recorded during the period centered on midnight in each time zone.

The Meanshift (netvar)

The first of our two pre-specified analyses for New Years looks at slight changes in the average score across eggs for each second. We calculate a *Z*-score for each egg, giving a normalized deviation from the expected score of 100. We then make a Stouffer *Z*, summing algebraically across all the eggs and normalizing by root *N*, resulting in a composite *Z*-score for each second. Next, the Stouffer *Z*-scores are squared to give a Chisquare distributed quantity, and we plot the cumulative deviation of the Chisquares accumulated over the specified period from the expected value.

This complicated process is designed to represent any tendency for the eggs to show correlated deviations. It is responsive to unusually large and unusually small scores, but primarily to consistency of behavior or correlation among the eggs. The measure is called netvar since it represents variance in the whole network. The graphs in the results section show for each New Year the accumulating history of deviations in the netvar over the 10-minute period around midnight, signal averaged across time zones. The terminal value in each case corresponds to the test of significance. For historical reasons, based on the positive deviations shown in the PEAR FieldREG experiments, (Nelson, et al., 1996) the formal prediction for the GCP events originally specified a positive deviation of the cumulative Chisquare from expectation, although it is arguable that a two-tailed prediction would be appropriate.

The Variance (devvar)

In the second analysis we picture the result by computing the sample variance (device variance) among the eggs. This measure is called devvar, and the calculation is made for each second during the hour surrounding midnight in each time zone. We then make a composite by signal averaging the resulting sequences across all time zones, finally normalizing the data as approximate *Z*-scores. This gives an hour-long sequence of 3600 points, centered on midnight, representing all the eggs and all time zones around the world (there are 37 zones including those with half-hour offsets).

The composite variance measure in this sequence is too noisy to reveal any structure, but when smoothed by a moving average, momentary tendencies and persisting trends can be seen. We use a 4-minute smoothing window, so each point in the final plot is the average of 240 seconds centered on that point. The graphical displays use only the central half hour surrounding midnight, which simplifies the picture by excluding overlaps with the half-hour offset zones.

Signal Averaging

The analyses of the data for each New Year's Eve are intended to identify structure. The basic notion is that as the New Year moment goes from time zone to time zone around the world, there will be subtle but detectable changes in the networked egg data. To visualize this we make a composite by averaging the period surrounding midnight across all time zones. We use the standard signal processing tactic called epoch or signal averaging to reveal any faint patterns or structure associated with the special moment of celebration around the world as the old year ends and the new begins. Signal averaging is a technique commonly employed in the measurement of weak but repetitive signals. Successive data records from such a signal with a well-defined trigger source (the stroke of midnight in this case) are summed to calculate one averaged signal. The technique exploits the fact that the signal, if present, is coherently summed. By contrast, any source of noise that is incoherent with respect to the trigger signal will, be washed out, i.e., will diminish in amplitude with successive averaging operations. "Signal averaging can be used to reveal signals that are buried in background noise and to increase signal-to-noise ratios from below unity to more acceptable levels" (Applications Weekly, 1998). An averaged data record, $y_{AVG}[i]$, is derived from *navgs* separate data records, $y_j[i]$, in the following manner:

$$y_{AVG}[i] = \frac{1}{navgs} \sum_{j=1}^{navgs} y_j[i] \quad 0 \le i < npts$$

Since it is applied to all averaged points, division by *navgs* is immaterial and does not change the shape of the averaged signal. Consequently, this operation is typically ignored. Figure 1 shows a simplified example, displaying the original traces and the combined data from several time zones. This is a selected set of ten populated zones chosen to demonstrate the clarifying effect of signal averaging.

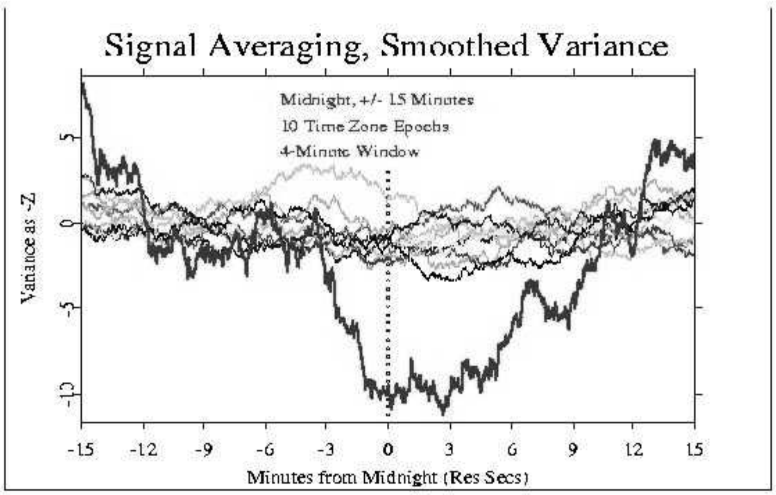

Fig 1 The heavy trace represents the signal average (sum) of ten 30-minute epochs centered on midnight, Dec 31, 1998 to Jan 1 1999. Each of the lighter traces is from one time zone, e.g., GMT or PST, selected to be one where the New Year is celebrated by large numbers of people.

Robust statistics

Computing a valid statistic for the meanshift analysis is simple: the terminal value of the cumulative deviation is compared with the appropriate Chisquare distribution, yielding a probability against chance.

The variance analysis is more complicated because the pre-specified hypothesis looks for both a deviation and a location, and it addresses smoothed rather than raw data. The figures in the results section (right panel) show the smoothed variance data for the New Year transition at midnight, ± 15 minutes. We use a random permutation analysis to find out how unusual the apparent structure in the data may be. We count the number of times a minimum of greater magnitude (depth) appears in 10,000 iterations, and count how many times the random permutations show a minimum point closer to midnight. The combination of these measures of magnitude and proximity gives an estimate of how likely it is that the apparent structure in the data is just a chance fluctuation. To create an appropriate comparison statistic, we combine the two into a single measure, and use permutation analysis to determine the probability of that measure against its null-hypothesis distribution. To test the hypothesis that there will be a reduction in variance and that it will occur near midnight, a logical candidate for a combined measure is $VT = a*Vmin \times b*dT$, where *Vmin* is the variance at minimum, *dT* is the absolute time interval from midnight, and *a* and *b* are pragmatically chosen coefficients to give both components roughly equal weight, that is, to have their respective variations contributing about equally to the variability of *VT*. Alternatively, we can use a sum rather than multiplication of the two components, but it turns out that the two approaches give similar results with suitably chosen coefficients. Either method allows us to establish the distribution of *VT* over a large number of data permutations. The probability of the original *VT* can then be calculated relative to this distribution.

In our application,

$$VT = a*Vmin \times b*dT$$

becomes

$$VT_i = 1 \div (1 - V_i) \times abs(T_i)$$

in each permutation, to compare with the original data value,

$$VT_0 = 1 \div \left(1 - V_0\right) \times abs\left(T_0\right),$$

which is expected to be large if the minimum is deep and close to midnight. The central half hour, midnight ± 15 minutes was used for the calculations.

RESULTS

The following figures show the netvar analysis on the left and the devvar analysis on the right. The former tests the prediction that the eggs will tend to produce relatively large and correlated deviations during the 10-minute period centered on midnight. The latter tests our prediction that as midnight approaches, the variability of the data across the eggs will decrease, reaching a minimum near midnight, then return to normal. The two measures are almost completely independent even though they are based on the same raw data.

1998-1999

The netvar measure is essentially flat (p = 0.591). It does not conform to the a priori prediction of a positive cumulative deviation. In the devvar measure (which is a post facto analysis for this year) the hypothesis of decreased variance near midnight is supported. The permutation analysis shows a deeper minimum only infrequently (p = 0.064), and the minimum was closer to midnight in about 4% of the random permutations (p = 0.035). The combination of magnitude and proximity in the *VT* statistic for 1998-1999 gives a probability of 0.023.

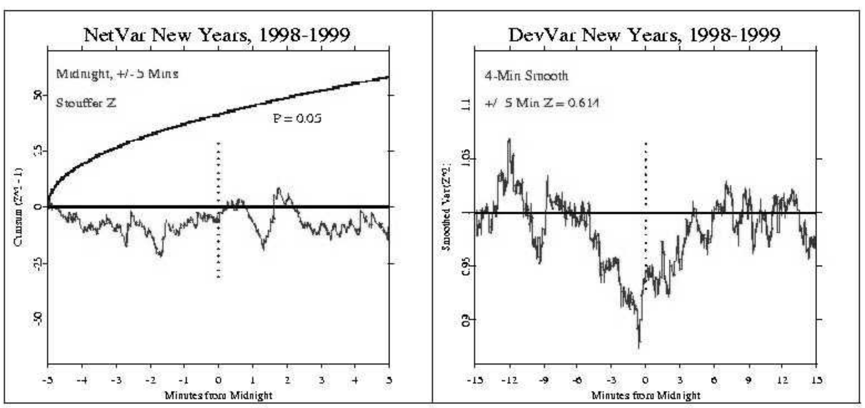

Fig. 2 New Year transition, 1998 to 1999. On the left, the cumulative deviation of the second-by-second network variance for the 10-minute period centered on midnight. On the right, the second-by-second device variance is shown, smoothed by a 4-minute moving average, during 30 minutes centered on midnight.

1999-2000

For the much anticipated "Y2K", the netvar measure is again quite flat; it certainly does not show the predicted positive trend (p=0.467). This was the first year for which an a priori prediction for variance reduction was made, by Dean Radin. The analysis method was not prespecified, however, so the current procedure, which was developed at that time, is applied post facto for 1999-2000. It is fully a priori in subsequent years. The result does indeed show a drop in variance near midnight. The minimum reached by the smoothed variance was exceeded by only about 6% of the permutations (p = 0.065). About 13% of the cases were closer to midnight in the random permutations (p = 0.130). The combination of magnitude and proximity yields a robust *VT* statistic for 1999-2000 with a probability of 0.090.

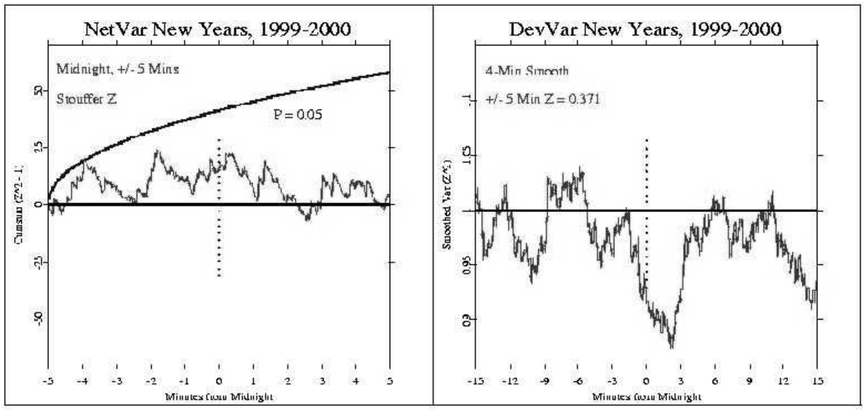

Fig. 3 New Year transition, 1999 to 2000. On the left, the cumulative deviation of the second-by-second network variance for the 10-minute period centered on midnight. On the right, the second-by-second device variance is shown, smoothed by a 4-minute moving average, during 30 minutes centered on midnight.

2000-2001

The New Year transition from 2000 to 2001 was not auspicious for the hypothesis. The netvar analysis showed a strong, persistent trend opposite to the prediction, with a terminal probability of 0.957. The devvar showed only a modest reduction around midnight. The deepest minimum reached by the smoothed variance was exceeded about a third of the time ($p = 0.352$), but it is fairly close to midnight, with 16% of the random permutations closer ($p = 0.164$). The combination of magnitude and proximity yields a *VT* statistic for 2000-2001 with a probability of 0.151.

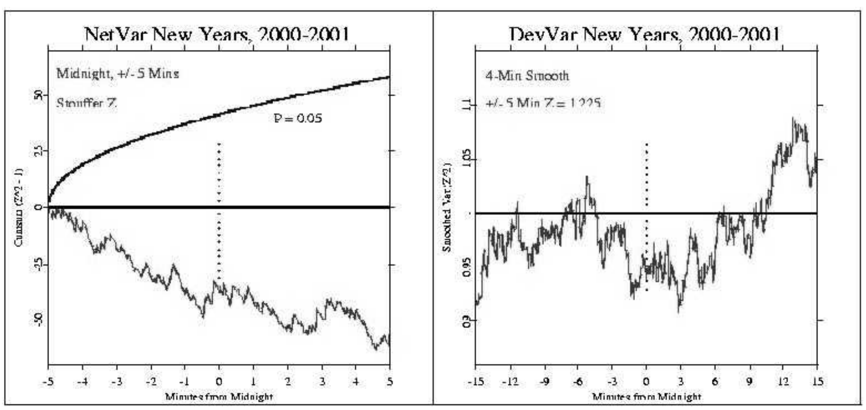

Fig. 4 New Year transition, 2000 to 2001. On the left, the cumulative deviation of the second-by-second network variance for the 10-minute period centered on midnight. On the right, the second-by-second device variance is shown, smoothed by a 4-minute moving average, during 30 minutes centered on midnight

2001-2002

For this year, the netvar does show a substantial positive trend, with probability 0.082. The devvar measure appears to match the prediction of reduced variance around midnight. However, appearances deceive somewhat, and the permutation analysis shows that the deepest minimum reached by the smoothed variance was exceeded more than 70% of the time ($p = 0.719$). On the other hand, the minimum was fairly proximate to midnight with about 16% of the permutations closer ($p = 0.164$). The combination of magnitude and proximity yields a *VT* statistic for 2001-2002 with probability 0.204.

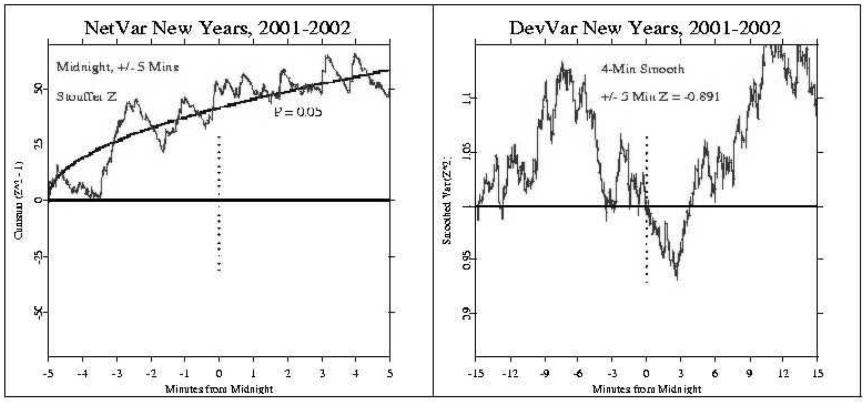

Fig. 5 New Year transition, 2001 to 2002. On the left, the cumulative deviation of the second-by-second network variance for the 10-minute period centered on midnight. On the right, the second-by-second device variance is shown, smoothed by a 4-minute moving average, during 30 minutes centered on midnight

2002-2003

The netvar measure was again strongly opposite to the prediction, with a negative trend through most of the 10 minute period. The terminal value corresponds to a probability of 0.934. In the device variance analysis, the result conforms well to the prediction. The deepest minimum reached by the smoothed devvar was exceeded about 1% of the time ($p = 0.010$), and it was very close to midnight, with only 6% of the random permutations being closer ($p = 0.063$). The combination of magnitude and proximity yields a *VT* statistic for 2002-2003 with probability 0.035.

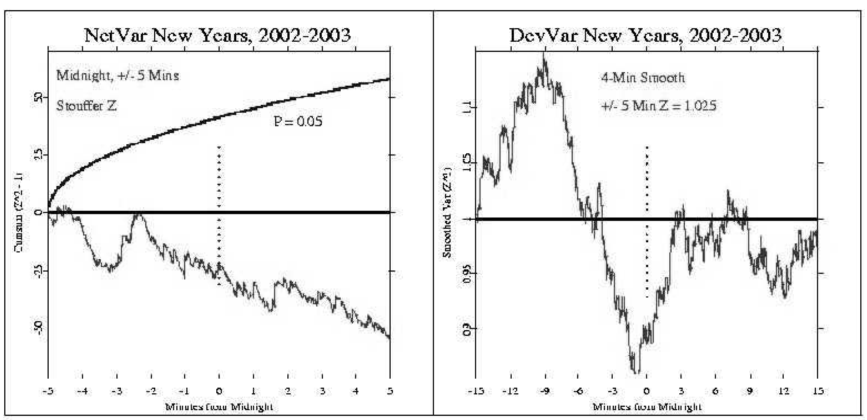

Fig. 6 New Year transition, 2002 to 2003. On the left, the cumulative deviation of the second-by-second network variance for the 10-minute period centered on midnight. On the right, the second-by-second device variance is shown, smoothed by a 4-minute moving average, during 30 minutes centered on midnight.

2003-2004

The netvar measure was mildly negative for about 5 minutes, and then mildly positive, with essentially no overall deviation. The terminal value corresponds to a probability of 0.522. The devvar analysis exhibits no pattern corresponding to the prediction. The deepest minimum reached by the smoothed variance was exceeded about a third of the time ($p = 0.324$), but it was so far from midnight that 97% of the random permutations were closer ($p = 0.974$). The combination of magnitude and proximity yields a *VT* statistic with probability 0.777.

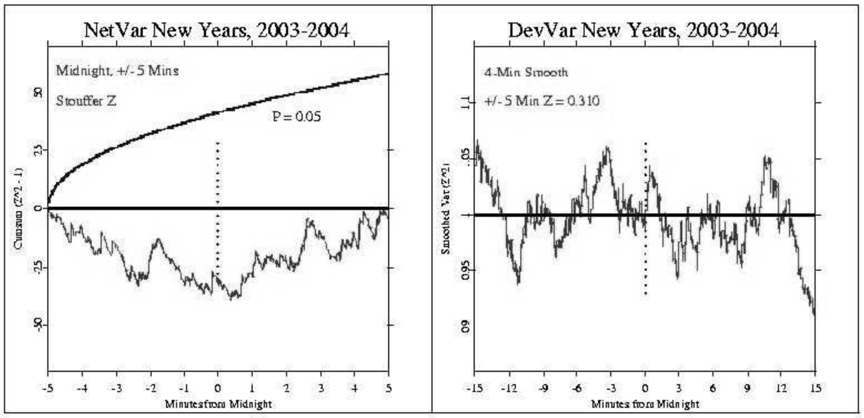

Fig. 7 New Year transition, 2003 to 2004. On the left, the cumulative deviation of the second-by-second network variance for the 10-minute period centered on midnight. On the right, the second-by-second device variance is shown, smoothed by a 4-minute moving average, during 30 minutes centered on midnight.

2004-2005

The netvar measure was slightly negative but with little overall deviation. The terminal value corresponds to a probability of 0.654. The devvar analysis does show a pattern corresponding to the prediction. The minimum reached by the smoothed variance was exceeded less than 4% of the time (p = 0.039), and approximately 14% of the random permutations were closer (p = 0.142). The combination of magnitude and proximity yields a *VT* statistic with probability 0.091.

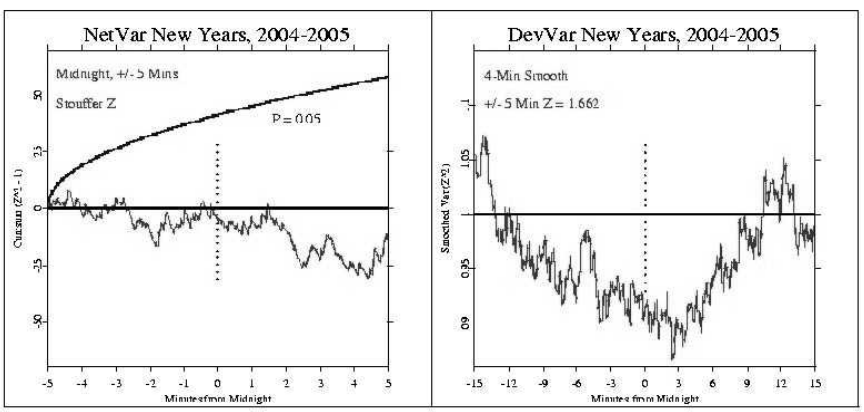

Fig. 8 New Year transition, 2004 to 2005. On the left, the cumulative deviation of the second-by-second network variance for the 10-minute period centered on midnight. On the right, the second-by-second device variance is shown, smoothed by a 4-minute moving average, during 30 minutes centered on midnight.

2005-2006

The netvar measure was essentially flat. The terminal value corresponds to a probability of 0.516. The devvar analysis for this year has a striking pattern, but it is opposite to the prediction. Near midnight, the variance actually increases to a high value. The minimum point that is the figure of merit for our analysis was a strong deviation, exceeded in the random permutations less than 2% of the time (p = 0.015), but it was so far from midnight (10 minutes early) that 60% of the random permutations were closer (p = 0.600). The combination of magnitude and proximity yields a *VT* statistic with probability 0.356.

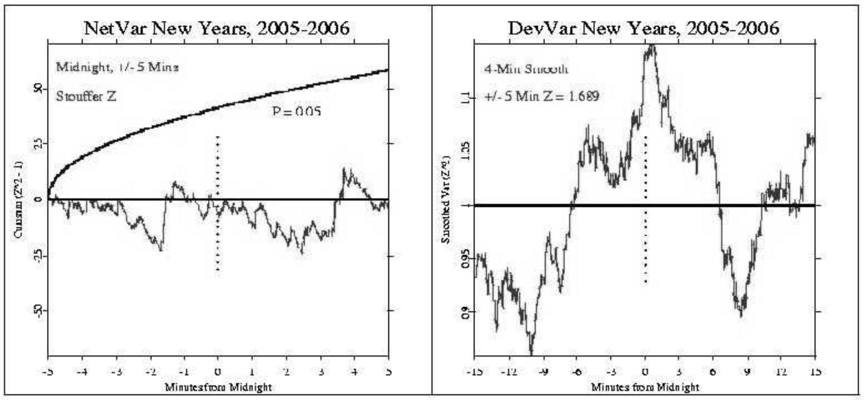

Fig. 9 New Year transition, 2005 to 2006. On the left, the cumulative deviation of the second-by-second network variance for the 10-minute period centered on midnight. On the right, the second-by-second device variance is shown, smoothed by a 4-minute moving average, during 30 minutes centered on midnight.

Combining across eight years

Finally, we look at the combined data from all eight years, presented in graphs similar to those for the individual years. For the meanshift or netvar measure, the squared Stouffer *Z* sequences for the eight years were averaged using the same Stouffer Z procedure across years. The graph in Figure 10 presents the result, which shows a persistent but non-significant negative trend during the 10-minute period centered on midnight. Two years had results that were strongly contrary to the prediction, and five of the eight were essentially flat. Only one year conformed to the prediction. The composite across all eight years has a terminal *Z*-score of -0.873, and p = 0.809. In the next phase of the project, focusing on refining our analytical approach, a measure similar to netvar will be included, with a prediction of a negative trend, based on results from the first seven years.

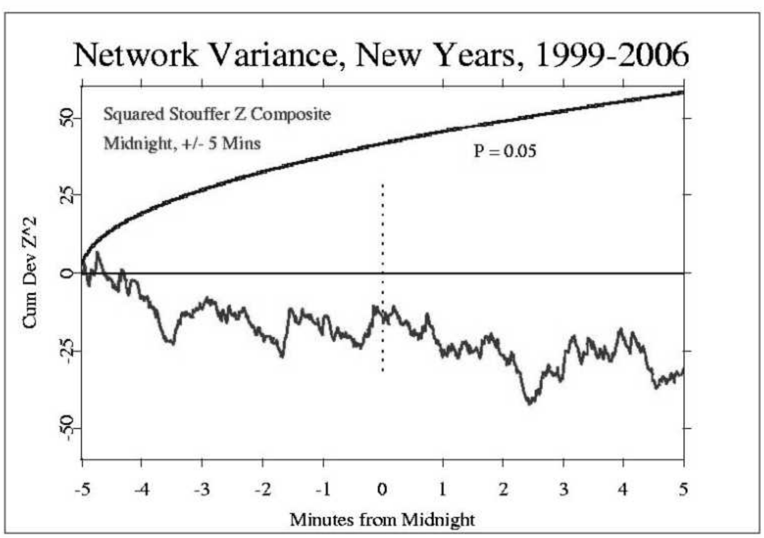

Fig.10 Meanshift (netvar) analysis for composite of eight years, 1999-2006, midnight ± 5 minutes. Each year was treated separately and the eight resulting 10-min sequences were signal averaged.

For the variance measure (devvar) averaged across all eight years, the outcome supports the prediction of decreased variance near midnight. Figure 11 shows that the composite variance begin to drop a few minutes before 12:00, reaches a minimum very close to midnight, and then returns to expected value shortly after. The permutation analysis applied directly to the combined data yields p = 0.088 for the minimum, p = 0.039 for its proximity, and p = 0.026 for the combination. A calculation of the variance probability based on the *VT* statistic estimated for the individual years can also be made by combining the probabilities from the separate years using an algorithm for meta-analysis (Rosenthal, 1984);

$$Chisq(df = 2N) = \sum_{i=1}^{N} -2\log_e p\ .$$

The result for the combined data from 1999 to 2006 has Chisquare = 32.917 on 16 degrees of freedom, corresponding to p = 0.0076. A Stouffer Z composition for the 8 years yields Z = 2.778, and p = 0.0027. These estimates suggest a stronger effect compared with the direct permutation analysis of the signal averaged data across years. This probably is because the *VT* statistic is sensitive to the specific shape of the signal averaged curve, so that the inverted spike in 2006 has a disproportionate effect on the magnitude and position of the minimum, and hence on the statistic.

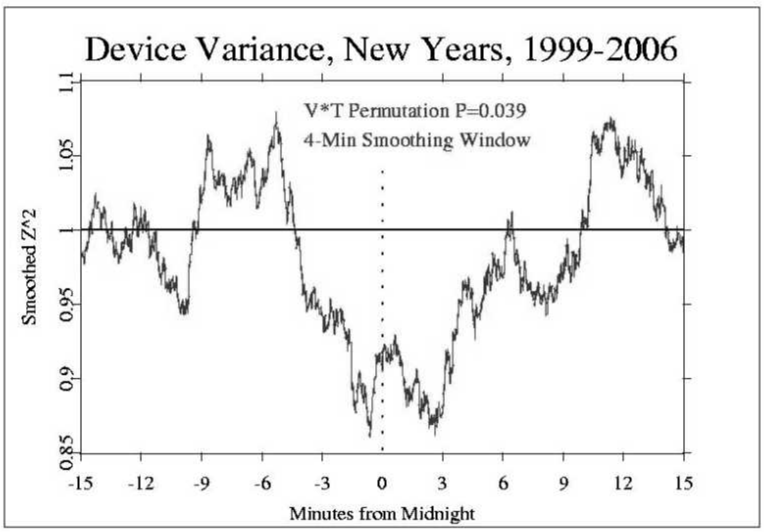

Fig.11 Variance (devvar) analysis for composite of eight years,1999-2006, midnight ± 15 minutes. Each year was treated separately by smoothing the raw device variance using a 4-minute window. The eight resulting smoothed half-hour sequences were signal averaged.

DISCUSSION

More than any other notable moment in time, New Year's Eve gathers us into a common, easy frame of mind. It evokes no strong emotions, though there's more love in the air than usual, and it isn't especially important. We come without much in the way of an agenda other than to wait together for the stroke of midnight, perhaps anticipating a hug or a kiss from someone close. The simple common interests that we share have no great impact, but they resonate and turn us all in the same direction for a brief time. We keep track of the hour, and we are ready when the count-down begins. There are few occasions when so many people think and feel in unison, and almost none that are so light and pleasurable.

It is an ideal moment about which to ask the scientific question for which the egg network was designed: Does a coherent or resonant state of consciousness in the mass of humanity have an effect we can detect?

There are alternatives to consider in case the evidence does point to an anomalous effect. One is that the experimenters' intentions and expectations may be the source of the anomaly. This is not the place to discuss observational models in depth, but they are relevant. Suffice it to say that the GCP data may be a useful empirical resource for theorists to consider. We do have to be clever to distinguish anomalous experimenter influences from the nominal sources of any effects. For example, though it is non-conclusive, we observe a strong, clear result in the variance analysis for 1998-1999, but that question had not been posed at the time, so there is a *prima facie* case that the effect was registered in the data without consciousness of the experimenters, and only revealed *post facto*, years later.

On the other hand, we also have interesting accidental evidence suggesting that the experimenter effect should be taken seriously. In the original analysis software I made a mistake in matrix manipulation, resulting in incorrect epoch definitions for the signal averaging across time zones. The netvar analyses for several years prior to discovery of the error showed a positive trend in accord with the hypothesis – but it was a mistake; the data were not from the 10 minutes surrounding midnight in each time zone. When the error was corrected, the positive trend disappeared, and the correctly treated composite meanshift shows a substantial negative trend. We cannot be sure what the original positive outcome means, but it is consistent with an experimenter effect somehow producing an incorrect analysis supporting the experimenter's expectations. A detailed "autopsy" of the erroneous calculation reveals that the false result was heavily weighted with data from time zones near GMT, which may have more celebrations and thus greater deviations, fortuitously recruited to support the hypothesis. (Of course the apparent deviations could also have been ordinary random fluctuation.)

To check our analysis procedures, we examine arbitrary data from different dates, as well as pseudorandom data (Walker, 2001). There is no suggestion of structure around the focal moment of midnight in either of these types of "control" data. On the other hand, we observe that the range of variation is very similar to that in the real data. The implication is that the effects we see are not only very small, but they are precisely dependent on the analysis parameters – if we change the question slightly, the outcome may be very different.

The empirical results indicate that the correlations we find operate on the grand scale of the total experiment – a level that sometimes is referred to as teleological. It appears that in this complex, networked experiment, just as in the laboratory with one person and a single REG machine, the anomalous correlations are just adequate to indicate that there is an effect. One may reasonably ask why the effect isn't amplified by having 20 or 30 or 50 REG devices instead of just one. The answer lies in the assumptions we make. While it is natural to think we can transfer models we are familiar with from physics to the less defined domain of consciousness research, it most likely is inappropriate in practice. We clearly are not looking at direct causal relationships or simple "bit-flipping". The question we're asking is more general: Is there a functional, creative and constructive role of consciousness in the physical world? The answer seems to be yes, but it is so subtle that it seems destined to remain, at least for now, in the realm of uncertainty.

There are other potential explanations, but the results reported here are consistent with the hypothesis that temporary large-scale interactions of human consciousness can have effects similar to those found in intention-based mind-machine experiments (Jahn, et al., 1999), and parallel to those in FieldREG experiments (Nelson, et al., 1996, 1998; Radin, et al., 1996). They indicate that the special state of global consciousness operationally defined by the New Year celebrations changes the behavior of our REG devices. At this point we do not have a causal explanatory link, but these analyses suggest that something new comes to exist in the world in conjunction with a shared state of mind focused by a major event. The experiment provides plausible evidence that coherent interconnections in the consciousness domain may produce correlated linkages among the independent random devices that comprise our GCP network.

The present analysis is one of many hypothesis-driven assessments we can make using the GCP database. We have tested and tentatively affirmed the hypothesis that our deep engagement with each other during New Year celebrations changes something measurable in the physical world. Future work will look for confirmatory and complementary analyses to extend our perspectives. For example, in 2005, we looked in depth at the previous seven New Years to develop an optimized prediction for subsequent years. Applied to the 2005-2006 transition, the refined analysis produced a modest positive outcome. (For details, see the links from the 2005-2006 New Year entries in the table at http://noosphere.princeton.edu/results.html). We should note that the present analysis is separate from the formal series of the GCP, which uses only *a priori* specified events.

The GCP database is a resource to be exploited for questions addressing interactions of consciousness with the physical world. We ensure that the data produced in the EGG network are unaffected by ordinary forces and fields, and comprehensive baseline and normalization procedures are in place to guarantee the quality of the data. The result is a multi-year archive of broadly distributed data that are truly random – unless the hypothesized effects of consciousness intervene. The design is thorough and explicit, intended to allow analyses that leave no viable alternatives to the conclusion that the patterns we discover in the data are correlated with events in the world, and by inference with events in the realm of human consciousness.

ACKNOWLEDGEMENTS

The Global Consciousness Project is largely a volunteer operation, to which some 80 individuals around the world contribute. They are listed on the GCP website on pages linked under http://noosphere.princeton.edu/egghosts.html, and noosphere.princeton.edu/programming.html. For some of the analytical procedures in this paper, I am indebted to York Dobyns and Peter Bancel, who suggested ways to address complex statistical issues.

REFERENCES

Applications Weekly (1998). *Epoch Averaging to Extract Weak Signals from Noisy Data http://www.gage-applied.com/resource/apps1998/981028.htm.* Issue #148 - Oct 28 1998. Downloaded Feb. 25, 2004.

Jahn, R. G., Dunne, B. J., Nelson, R. D., Dobyns, Y. H., Bradish, G. J. (1997). Correlations of random binary sequences with pre-stated operator intention: A review of a 12-year program. *Journal of Scientific Exploration, 11,* (3), 345-368.

Nelson, R. D. (2001). *Correlation of Global Events with REG Data: An Internet-Based, Nonlocal Anomalies Experiment . The Journal of Parapsychology, 65,* 247-271.

Nelson, R. D. (2002). Coherent Consciousness and Reduced Randomness: Correlations on September 11, 2001. Journal of Scientific Exploration, *16*, (4), 549–570.

Nelson, R. D., Radin, D. I. Shoup, R. Bancel, P. A. (2002). Correlations of Continuous Random Data with Major World Events. *Foundations of Physics Letters, 15* (6), 537-550.

Nelson, R. D., Bradish, G. J., Dobyns, Y. D., Dunne, B. J., Jahn, R. G. (1996). FieldREG Anomalies in Group Situations, *Journal of Scientific Exploration, 10*, (1), 111.

Nelson, R. D., Bradish, G. J., Dobyns, Y. H., Dunne, B. J., Jahn, R. G. (1998). FieldREG II: Consciousness Field Effects: Replications and Explorations. *Journal of Scientific Exploration, 12*, (3), 425-454.

Radin, D. I., Rebman, J. M., Cross, M. P. (1996). Anomalous organization of random events by group consciousness: Two exploratory experiments. *Journal of Scientific Exploration, 10*, (1), 143-168.

Radin, D. I., and Nelson, R. D. (1989). Evidence for consciousness-related anomalies in random physical systems. *Foundations of Physics, 19*, (12), 1499-1514.

Walker, J. (2001). *Pseudorandom Data and Clone Analyses. http://noosphere.princeton.edu/pseudoeggs.html.* Downloaded Feb. 25, 2004.

ANOMALOUS ANTICIPATION OF TARGET BIASES IN A COMPUTER GUESSING TASK

John Palmer
University Hospital Zürich
Zürich, Switzerland

ABSTRACT

This paper reports the results of 2 experiments originally intended to study implicit sequence learning (ISL). Participants (Ps) were asked to identify in which of 4 directions (up, down, left, right) an arrow would be pointing that they would see immediately after their response (trial-by-trial feedback). In Experiment 1, 35 male Ps received 1 100-trial run with random targets followed by 2 100-trial runs with biased targets. The bias was defined as the target for trial t+1 being displaced 90 degrees clockwise (CW) or counterclockwise (CCW) from the target for trial t. The order of the 2 biases was counterbalanced across Ps. Pro-bias targets appeared in 46.5% of the trials, counter-bias targets in 10.1%, and each orthogonal alternative in 25.2%. 18 Ps were extreme believers in the paranormal (sheep) and 17 were extreme skeptics (goats). Half of each group received a levodopa pill (dopamine) before the test session and the other half a placebo. The dependent variable, relative pro-bias responding (rPBR), was the difference between pro-bias and counter-bias responses (e.g., CCW responses in CW-biased runs). A succession of post-hoc analyses intended to clarify a marked CW response bias in the 1st half of the 1st biased run among levodopa Ps responding to CW-biased targets revealed a suggestive tendency for levodopa Ps to "anticipate" in the random run the target bias (CW or CCW) they would receive in their 1st biased run. As Ps at this time had been told nothing about the targets in the biased runs, this suggestive finding was called an anomalous anticipation effect (AAE). To determine if the AAE might be present elsewhere in the data, the random run was analyzed using the same ANOVA that had been used to test for ISL in the biased runs, with the target bias defined as that which Ps would receive in their 1st biased run. The ANOVA revealed a significant belief x half-run interaction, in which sheep demonstrated an increase in rPBR from the 1st to 2nd half-run and goats a corresponding decrease. This finding was interpreted as correct and incorrect anticipation by goats and sheep respectively in the 1st half of the random run; the 1st-2nd half differences were interpreted as changes in strategy due to non-reinforcing feedback during the run. The sample for Experiment 2 was 40 females. The main procedural changes were no levodopa condition and a between-P manipulation of target bias, with each P receiving 2 200-trial biased runs. The ANOVA of the random run revealed a significant main effect for belief, with goats anticipating correctly and sheep incorrectly. In both experiments, skeptics scored significantly higher than believers in the 1st half of the random run. The reversal of the traditional sheep-goat effect was speculatively attributed to goats being more comfortable than sheep in the test situation, a circumstance created by the fact that, in contrast to most sheep-goat experiments, both experimenters were goats.

INTRODUCTION

Sometimes scientific discoveries are made by accident, and the following report describes such a case. I was asked by my colleague, Dr. Peter Brugger, to perform some supplementary analyses on the data from an experiment conducted by a student in our Department of Neurology at the University Hospital Zürich for his Masters Thesis (Krummenacher, 2003). The experiment was intended to explore factors that influence implicit sequence learning (ISL), which in the present context refers to the unconscious apprehension of a nonrandom bias introduced into a sequence of discrete targets. ISL has been demonstrated in a number of previous experiments (Stadler & Frensch, 1998). The kinds of sequences used in ISL research are similar to those one finds in forced choice ESP experiments, except that in parapsychology the sequences are supposed to be random. Brugger and Taylor (2003) have argued that ISL could be an alternative explanation to ESP for the results of some ESP experiments with trial-by-trial feedback, provided, of course, that the target sequences are nonrandom.

Empirical evidence for this contention comes from research by Colwell, Schroder and Sladen (2000). In their first experiment on the “sense of being stared at”, participants who were either being stared at or not stared at by a remote observer completed a serial guessing task. Above chance scoring was found only in staring trials in which participants received immediate feedback of the correctness of each guess. However, subsequent testing for local regularities in the target sequences revealed more alternations between staring and non-staring trials than theoretically expected. In a replication experiment using true random sequences, chance results were obtained. The authors concluded that the improvement in accuracy during staring episodes was due to the detection and response to local structure (i.e., an underrepresentation of repeats) present in the target sequences, rather than to an increased ability to detect staring -- in other words, to ISL rather than ESP. However, it should be noted that this criticism does not apply to all successful ESP studies with trial-by-trial feedback. In at least two studies, the source for the targets was shown to be adequately random in comparable control tests (Honorton, 1987; Vassy, 1986). A thorough test of the target sequences themselves in the extensive precognition experiments of Schmidt (1969) showed them to be satisfactorily random (Palmer, 1996).

Krummenacher (2003) hypothesized that ISL would be facilitated by 2 factors, belief in the paranormal and increased levels of cerebral dopamine, which he manipulated in a 2 x 2 design. The belief hypothesis is based on data indicating that believers in the paranormal are more likely than skeptics to see patterns in stimulus conglomerations that are in fact purely random, such as photographs totally degraded by electronic noise (Blackmore & Moore, 1994) or two-dimensional random dot patterns (Brugger et al., 1993). In terms of signal detection theory, this means that belief in the paranormal appears to be associated with a low response criterion. In fact, the higher than normal hit rate in sheep as compared to goats was mainly observed for "yes" but not "no" answers in the study by Colwell et al. (2000). The relevance of such data to ISL arises from the plausible although not demonstrated assumption that *attribution* of patterns to patternless stimulus sequences is positively associated with the implicit *detection* of those that are in fact contained in the sequences. The dopamine hypothesis was based on data indicating that in healthy participants ISL depends on the functioning of striatal brain regions (Peigneux et al., 2000), which are strongly innervated by dopamine containing neurons (Hikosaka, Takikawa, & Kawagoe, 2000). Moreover, the anticipation of reward triggers dopamine release in subcortical pathways (Schultz, Dayan, & Montague, 1997; Spanagel & Weiss, 1999), and dopamine-containing cells in the monkey brain have been found to increase their firing rate before a highly probable, but not before a certain reward is provided (Schultz et al., 1997).

EXPERIMENT 1

METHODS[1]

Participants

Physically and mentally healthy right-handed males between 20 and 40 years of age were enrolled in the study. Individuals were recruited by flyers posted at the University of Zürich and bookstores or shops in the University district, by an advertisement in a local newspaper, and by a call to a local radio station. The recruiting material introduced the study as an "experiment in neuropsychology assessing the role of dopamine on cognitive functions". It mentioned that each participant may or may not receive dopamine and that in any case blood samples would be taken. An unspecified fee was announced as reimbursement. Critically, the material used to recruit believers in ESP listed as an inclusion criterion the phrase "*You do not only consider extrasensory perception a theoretical possibility but you think you are using your own paranormal abilities in everyday situations*" (without further justification of why this was a requirement). A standardized telephone interview excluded those persons with a personal or first-degree family history of neurological and psychiatric disease as well as serious learning disabilities and drug abuse (cf., Campbell, 2000). In view of the association of claimed paranormal, especially ESP, abilities and temporal lobe epilepsy (Neppe, 1983; Sadler & Rahey, 2004), occurrence of previous seizures was specifically inquired about (none was reported). Casual consumption of THC (marijuana) was not considered an abuse, provided that the time since last consumption was more than 2 months. Persons meeting all inclusion criteria were sent a brief information brochure (by regular mail) about the role of dopamine in the central nervous system, including potential side effects if it were taken at high doses. This brochure also described the task as one that required the prediction of a series of events presented on a computer screen. It also mentioned the requirement to fill in several questionnaires, as well as the approximate duration of the session ("one to two hours") and the financial reimbursement (50 Swiss Franks, about 40 U.S. Dollars).

After the final selection of 20 "believers", a new version of the flyer was posted at similar locations. It was identical to the 1st flyer, except that the passage referring to belief in the paranormal stated: "*You have a skeptical attitude toward so-called 'paranormal' phenomena and do not generally believe in the existence of or have experienced extrasensory perceptions like telepathy, clairvoyance and precognition*". Initial telephone interviews and information about the study were the same as described above. This solicitation yielded 20 "skeptics", who were matched to the believers with respect to age and educational background. This brought the total sample size to 40.

Questionnaires

Prior to the test session, participants were mailed copies of 3 questionnaires, which they completed and brought with them to the session. In addition to a brief handedness inventory, two questionnaires were used to assess participants' experiences of and attitude toward paranormal phenomena. The *Australian Sheep-Goat Scale* (ASGS) is an 18-item paranormal belief scale presented in a visual analog format (Thalbourne & Delin, 1993). This instrument (revised form; our translation) was considered especially relevant for this experiment since it assesses not only participants' *belief* in psychic phenomena, but also their own relevant experiences. Each item is scored continuously from 0 to 13 by measuring the distance in centimeters from the skeptical endpoint of the line to P’s mark, giving a possible range of 0 to 234. The *Magical Ideation* (MI) *Scale* is conceptualized as an indicator of schizotypy (Eckblad & Chapman, 1983).

[1] The procedure for this experiment was approved by the Ethics Committee of the University Hospital Zürich.

Consisting of 30 true/false items, it requires participants to indicate their belief in a range of paranormal phenomena, including telepathy and precognition but also spanning the topics of extraterrestrial life and contacts with the deceased. Pronounced MI and analogous measures of schizotypy are reportedly associated with elevated scores on questionnaires assessing belief in supernatural or paranormal phenomena (Wolfradt & Straube, 1998).

Substance Administration

After having provided informed consent, participants in the levodopa group were administered a dual-release formulation of 200 mg levodopa/ 50 mg benserazide (Madopar® DR, Roche Pharma AG, Reinach, Switzerland), with fast absorption during the first hour and sustained concentration levels thereafter. Also following informed consent, participants in the placebo group received 1 tablet of Berocca® (Roche Pharma Switzerland), a multivitamin preparation. All participants consumed 200ml water directly after substance administration. The experimenter left the room during intake of the substance. Blood samples were collected after 30 min (before the experiment started) and again after testing was completed (about 120 min after the first sample).

Guessing Task

Target sequences. Each participant completed 3 runs with 100 guesses each. A different sequence of target directions was used for each run. The sequences were generated using a self-written computer algorithm and *Fortran* software. In all 3-target sequences, the 4 different arrow directions occurred equally often (25 times). In the 1st run, the distribution of the 25 targets was randomly permutated. The remaining 2 sequences followed a fixed bias, such that the direction of the arrow in trial t depended statistically on the direction of the arrow in trial t-1. Specifically, one of the biased sequences was characterized by a 90° clockwise rotation of consecutive arrow directions (CW), whereas the other was characterized by a 90° counterclockwise bias (CCW). The target sequences were the same for each participant.

Optimal values for the degree of bias in the biased sequences had been determined by a pilot study (*N* = 12) designed to guarantee (1) unawareness of the bias on a verbal level in most of the participants, and (2) the occurrence of implicit learning of the bias in a majority of the unaware participants. The pilot-study participants were not preselected for belief/disbelief in the paranormal. Following the psychophysical method of limits, the sequential biases (CW and CCW, respectively) were increased or decreased until performance of an individual participant revealed implicit but not explicit sequential learning. Immediately after receiving a random run followed by a biased run, participants were asked in an extensive open-ended interview about their guessing strategies, in order to determine whether they had been aware of any sequential bias and, if so, at what point during the run(s) they had noticed a pattern. The optimal values determined by this process were 46.5% of the trials in the pro-bias direction (for example, clockwise in the CW run) and 10.1% in the counter-bias direction. The 2 other alternatives both appeared 25.2% of the time.

Procedure

Participants were told that the computer would randomly select one of the 4 directions on each trial. They were required to predict the direction of the next arrow in the target sequence by pressing with the right hand one of four response keys, marked with an arrow for each direction and located on the right side of the computer keyboard. After participants' predictions, the computer provided immediate feedback by highlighting the "correct" arrow for 2 sec. Although prediction times were not limited, the spontaneity of each decision was emphasized. Whenever participants' guesses matched the computer's choice, the word "hit" overlaid the arrow; otherwise the German word "schade" (too bad) appeared. The experiment was controlled by "Superlab Pro 2.01" software.

Prior to the formal runs, all participants received 10 "practice trials" (discarded from analysis) and were then left alone in the experimental room until all 3 runs had been completed. The 1st formal run was always the random run; the 2nd and 3rd runs were either CW or CCW, the order counterbalanced between participants. Participants were not informed about how many trials were in a run, but just told that it would last approximately 7 minutes. Immediately following the test session, participants were asked whether they believed they were given a placebo or levodopa. They were also asked extensively about their response strategies, such as whether they "discovered any 'system' in the presentation of arrows", or whether they used any particular guessing strategy.

RESULTS

Sample

The post-experimental interview revealed that 4 participants explicitly recognized the sequential manipulation. Two were from the placebo group (1 believer, 1 skeptic) and 2 from the levodopa group (1 believer, 1 skeptic). Another participant (skeptic, placebo) ignored the instruction to respond spontaneously and without an obvious pattern. His responses were highly perseverative: 59.9% were repetitions of the same motor prediction as the feedback in the previous guess, a value more than 2 *SD*s above the group mean. These 5 participants were excluded from the analyses, reducing the final sample size to 35.

Believers scored higher than skeptics on both the ASGS, M = 168.72 vs 38.00, $t(33) = 13.1$, $p < .001$ and the MI Scale, M = 19.94 vs 3.59, $t(33) = 15.1$, $p < .001$.

The blood tests revealed no levodopa in the placebo group. In the levodopa group, the mean levodopa serum concentration was 159.8 ± 144.4 ng/ml for the first blood sample and 208.4 ± 106.7 ng/ml for the second blood sample, $t(16) = 1.04$, $p = .314$. A similar number of participants had higher levodopa concentrations in the 1st (n = 8) and 2nd (n = 10) samples, $\chi^2(1, N = 18) = 2.22$, $p = .136$. None of the participants reported remarkable side effects, nor could they reliably guess whether they had received levodopa or a placebo.

Guessing Task[2]

For the two biased runs separately, the number of pro-bias and counter-bias predictions were calculated. For instance, predicting "DOWNWARD" after the previous target was "RIGHTWARD" was scored as a pro-bias guess in the CW run, but a counter-bias guess in the CCW run. The number of pro-bias minus the number of counter–bias predictions thus reflected a participant's tendency to adjust the sequential structure of his guesses to that in the target sequence. This variable is labeled as relative pro-bias responding (rPBR). Because the 1st trial of each run could not be scored (there is no prediction preceding the very first prediction), there were 99 total scored trials per run. It was decided arbitrarily to define the 1st half as 50 trials and the 2nd half as 49 trials. To make the scores from the 2 halves comparable, they were converted to percentages for analysis.

The ISL hypotheses were tested by submitting the rPBR scores from the 2 biased runs (B1 and B2) to a mixed ANOVA, with belief, substance, and order of testing (CW-CCW, CCW-CW) as between-subject factors, and run and half-run as repeated measures. As described more fully in Palmer et al., submitted), a suggestive trend ($p < .10$) was found indicating improvement in rPBR from the 1st to the 2nd halves of the combined biased runs among believers who had also received levodopa, as compared to the other groups.

Subsequent inspection of the 32 rPBR means representing the cells in the ANOVA (and in the 1st 4 numeric columns of Table 1) revealed one exceptionally large value of 15.5 in the 1st half of B1 among the 4 levodopa skeptics for whom the bias in this run was CW. It was noted further that the second highest mean (11.6) represented data for the same half-run for the 5 levodopa believers for whom the bias in this run was also CW. Because of the similar definitions of these 2 cells (both represented levodopa believers in the 1st half of B1), it seemed reasonable to combine them to produce a single cell with a large enough n (9) to merit statistical analysis. The new cell (L-CW) -- defined as rPBR scores for the 1st half of B1

[2] All p-values reported in the paper are two-tailed.

among all levodopa participants for whom the target bias was CW -- had a mean rPBR of 13.33 (*SD* = 5). Partly because of the low standard deviation (which also reflected the fact that the mean was not elevated by outliers), this mean was highly significant compared to chance, $t(8) = 8$, $p = .00004$, even when adjusted for the large selection factor.[3] It differed significantly, $t(16) = 3.22$, $p = .005$, from that of the 9 levodopa participants who received the CCW bias in B1 ($M = 1.33$, $SD = 10$). Although there was a large drop-off of rPBR in the 2nd half of B1 among the 9 L-CW participants, this 2nd-half mean still approached significance ($M = 6.12$, $SD = 8.35$), $t(8) = 2.20$, $p = .059$. The drop-off was due mostly to the skeptics, whose rPBR declined almost to the null level ($M = 0.90$, $SD = 10.16$).

Further inspection of the data from the L–CW participants revealed that the effect in the 1st half of B1 was concentrated in those trials in which the target for trial t-2 itself bore a CW relationship to the target for trial t-1. This analysis suggests that if these participants implicitly observed a CW relationship between two consecutive targets, they appeared to assume that this contingency would be repeated and select their next prediction accordingly. In other words, they "looked" 2 trials back as well as 1 trial back to define the bias. These trials yielded a mean rPBR of 11.56 ($SD = 2.88$), $t(8) = 12.02$, $p < .001$, whereas the mean rPBR for those trials in which rPBR occurred in the absence of a CW relationship between the 2 preceding targets was just 2.04 ($SD = 5.40$) and nonsignificant. The difference between these means is significant, $t(8) = 4.08$, $p = .004$.

		Run 1		**Run 2**		**Total**	
Group	**First**	**Half 1**	**Half 2**	**Half 1**	**Half 2**	**Half 1**	**Half 2**
L-Dopa/Believers	CW (*N*=5)	**11.6**(3.84)	10.6(7.6)	3.2 (9.65)	11.0(7.2)	7.4 (6.3)	10.8 (2.0)
L-Dopa/Believers	CCW (*N*=4)	4.0 (14.3)	1.5 (8.4)	-0.5(11.8)	3.1 (12.8)	1.8 (7.1)	2.3 (9.7)
L-Dopa/Skeptics	CW (*N*=4)	**15.5**(5.8)	0.5 (5.9)	3.0 (15.0)	-3.1 (8.6)	9.3 (9.8)	-1.3 (4.4)
L-Dopa/Skeptics	CCW (*N*=5)	-0.8 (5.8)	-1.2(13.4)	2.8 (12.5)	-2.4 (7.3)	1.0 (4.8)	-1.8 (5.3)
Placebo/Believers	CW (*N*=4)	2.5 (3.8)	0.5 (6.7)	-0.5 (7.2)	-2.0 (9.7)	1.0 (5.0)	-0.8 (3.9)
Placebo/Believers	CCW (*N*=5)	4.8 (5.4)	2.4 (6.7)	-8.4 (7.3)	0.0 (8.5)	-1.8 (5.7)	1.2 (7.1)
Placebo/Skeptics	CW (*N*=4)	4.5 (12.4)	5.1 (14.0)	-9.0(12.7)	0.5 (10.7)	-2.3(10.4)	2.8 (12.3)
Placebo/Skeptics	CCW (*N*=4)	-3.5 (3.8)	-1.5 (6.7)	2.0 (11.4)	5.6 (5.1)	-0.8 (6.4)	2.0 (3.0)

SDs are shown in parentheses.

Table 1 Relative pro-bias responding in each half of each biased run as a function of substance, belief and order of target bias. The 2 highest means, discussed in the text, are in boldface.

The anomalous anticipation effect

The effect in question seemed best interpreted as a temporary relative CW (rCW) response bias induced by the levodopa. If this interpretation is correct, one should expect the same CW bias to appear for these participants in the 1st half of the immediately preceding random run. Analysis of the revised rPBR scores, all coded in the CW direction, for the 1st half of the random run among these 9 participants suggests that a

[3]Assuming $N(N-1)/2 = 496$ possible pairings of the $N = 32$ means, and a conventional alpha level of .05, the Bonferroni adjusted alpha-level for this analysis is .0001. The test *p*-value of .00004 safely exceeds this alpha level.

slight rCW bias was indeed present (M = 5.32, SD = 9.09), $t(8) = 1.76$, $p = .116$. It was then reasoned that the same tendency should appear in the random run among the levodopa participants who were to receive the CCW run 1st, as at this point they had been treated identically to those levodopa participants who were to receive the CW run 1st. Not only was the rCW bias not found among these participants, but instead they manifested an rCCW bias (M = -2.31, SD = 9.23) that differed suggestively from the rCW bias of the other levodopa participants, $t(16) = 1.77$, $p = .096$. This difference between the 2 subgroups, if real, implies that the levodopa participants somehow "anticipated" during the random run which kind of bias they were to receive in the next run, and they reflected this, presumably unconscious, "knowledge" by responding in corresponding fashion in the random run. Could this be extrasensory perception (ESP)? As ESP is not an explanation but an assertion that a credible explanation is lacking (Palmer, 1988), it was decided to call this finding an *anomalous anticipation effect* (AAE).

The question now arose as to whether this AAE, which can only be considered suggestive, might apply more broadly in the data. Thus, the random run was submitted to an ANOVA similar to that applied to the biased runs, except that the task-order and run factors were removed. The rPBR scores were computed such that pro-bias and counter-bias responses were defined according to the bias that would be present in B1 for that participant, as this is the run where the original AAE (described above) occurred. The ANOVA revealed a significant belief by half-run interaction, $F(1,33) = 10.25$, $p = .003$. As illustrated in Figure 1, irrespective of whether the target bias in B1 was to be CW or CCW, in the random run believers showed a 1st to 2nd half-run increase in rPBR and skeptics a corresponding decrease. The mean for believers was -1.89 (SD = 7.56) in the 1st half-run and 4.40 (SD = 9.53) in the 2nd half-run, a significant difference, $t(17) = 2.17$, $p = .044$. The mean for skeptics was 3.53 (SD = 7.79) in the 1st half-run and -3.67 (SD = 10.96) in the 2nd half-run; again, the difference was significant, $t(16) = 2.42$, $p = .028$. Skeptics showed significantly greater rPBR than believers in the 1st half of the run, $t(33) = 2.09$, $p = .045$, but believers had higher rPBR scores than skeptics in the 2nd half-run, $t(33) = 2.33$, $p = .026$. None of the cell means were significantly different from 0 by t-test. The interaction reflects an AAE in the sense that participants "anticipated" the bias they would receive in B1 by scoring in the random run in a way that either supported or directly contradicted this bias.

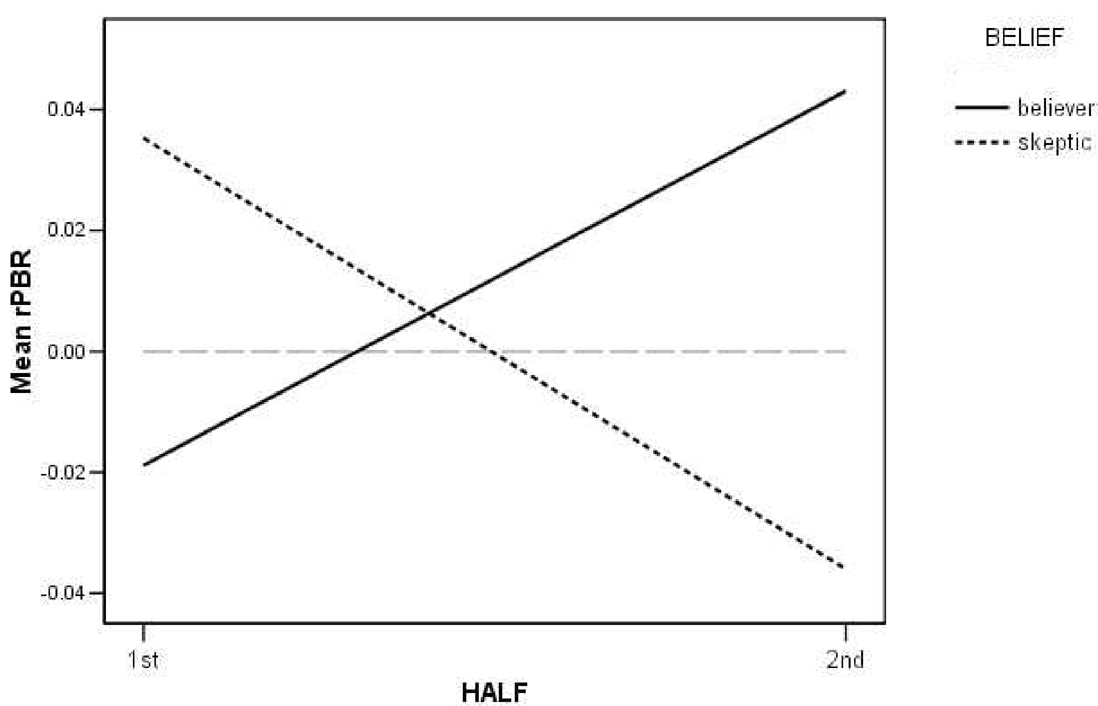

Fig. 1 Mean relative pro-bias responding in the 1st and 2nd halves of the random run in Experiment 1 as a function of belief.

DISCUSSION

The suggestive evidence of a difference between CW and CCW response biases among levodopa participants in the random run is important not because it provides strong evidence for an AAE, but rather because it led to another analysis that we would never otherwise have thought to do. In fact, the basic AAE, apart from its mediation by belief, was actually predicted from these analyses, which were computed in an effort to explain a non-psi effect. Thus, the AAE is not entirely post hoc and certainly not the result of massive, mindless data snooping. The new ANOVA, which structurally amounted to a test for learning of a random target sequence, surprisingly produced one of the statistically strongest outcomes of the experiment – namely, the belief by half-run interaction ($p = .005$) indicating that believers increased rPBR (defined by the target bias in B1) during the random run, whereas skeptics decreased it. The interaction assumes foreknowledge of the direction of the bias in B1. We consider it "anomalous" in the sense that (except for a possible experimenter bias effect discussed below) we cannot offer an explanation in terms of any known ways participants could have obtained this foreknowledge.

It is most reasonable to assume, based on the significant difference in rPBR between believers and skeptics in the 1st half of the random run, that prior to or early in the random run participants somehow received, unconsciously, correct information about the *nature* of the target bias, but either incorrect information or, more likely, no information at all about *in which run* the bias would manifest. If they received no information about timing, it would be natural for them to assume that the bias applied to the run they were then engaged in -- the random run. Skeptics processed this information about the nature of the target bias in B1 correctly, whereas believers distorted the information, identifying the bias as opposite to what it really was – exactly the reverse of the traditional sheep-goat effect (Schmeidler & McConnell, 1958/1977). As the random run progressed, both groups realized from the feedback that their "strategy" wasn't working, so they tried the exact opposite strategy for the remainder of the run. The fact that they chose a reverse strategy rather than an entirely different strategy suggests that they may still have attached some credibility to the original information, thinking perhaps that they had misinterpreted the direction. Finally, it is assumed that all this reasoning was implicit, that is, unconscious.

A possible alternative interpretation for the AAE appeals to experimenter expectancy (Rosenthal, 1966), because the experimenter who interacted with the participants, although blind to individual targets, was not blind to participants' belief status or the target biases of the individual biased runs. However, as the experimenter was not present with participants in the room when the runs were actually conducted, any biasing information about target order would have needed to be introduced during the presentation of instructions prior to the runs themselves. The information necessary to bias the results is sufficiently complex that it is highly unlikely that it could have been effectively communicated unwittingly during the introductory periods. Moreover, the experimenter knew of the experimenter expectancy through his academic training, and we are aware of no research indicating that experimenter expectancy functions when the experimenter is sensitized to it. In conclusion, experimenter expectancy is highly unlikely as an interpretation of the anomalous findings of this experiment.

EXPERIMENT 2

METHODS

Experiment 2 was not intended as a replication of Experiment 1, and data collection in fact began before the results of the earlier study had been fully analyzed. Nonetheless, the methodology for the 2 experiments was the same, except for the following changes.

1) Whereas Experiment 1 used an exclusively male sample, Experiment 2 used an exclusively female sample. The primary reason for this decision was to balance the invasion of our limited pool of potential

participants in anticipation of further follow-up research. The sample size was 40. The recruitment procedure was the same as for Experiment 1.

2) Experiment 2 did not include a dopamine condition.

3) We decided to maintain the same kind of target bias (CW or CCW) for all the trials of a given participant. We became concerned that shifting to the opposite bias after the 1st biased run, as was done in Experiment 1, might confuse participants by introducing a negative transfer effect and thus inhibit ISL. Therefore, the direction of bias was manipulated between participants rather than within participants.

4) For similar reasons, we compressed the 2 100-trial runs of the previous study into a single 200-trial run, thereby maintaining the continuity of the task. We also decided, for purely exploratory purposes, to add an additional 200-trial run, to see if ISL would stabilize or perhaps advance as a result of more extensive testing with feedback.

5) Each participant had her own target sequences.

6) The experimenter was blind to the target biases of individual participants.

RESULTS

The AAE hypothesis was tested the same way as in Experiment 1, using a mixed ANOVA with belief as the between-participant factor and half-run as the within participant factor. The rPBR scores were based on the target bias in the succeeding biased runs for the P in question. The hypothesis predicted a significant belief by half interaction, but this interaction was not in fact significant, $F(1,36) = 1.21$, $p = .278$. Thus, the hypothesis was not confirmed. However, the trends were in the predicted direction, with believers showing an increase in RPBR from the 1st half ($M = -.048$; $SD = .088$) to the 2nd half ($M = -.014$; SD = .132) of the random run, and skeptics showing a decrease from the 1st ($M = .031$; $SD = .130$) to the 2nd ($M = .005$; $SD = .093$) half. Moreover, in the 1st half of the random run the believers scored significantly lower than the skeptics, $t(38) = 2.25$, $p = .030$, confirming the result from Experiment 1. The AAE for Experiment 2 is illustrated in Figure 2.

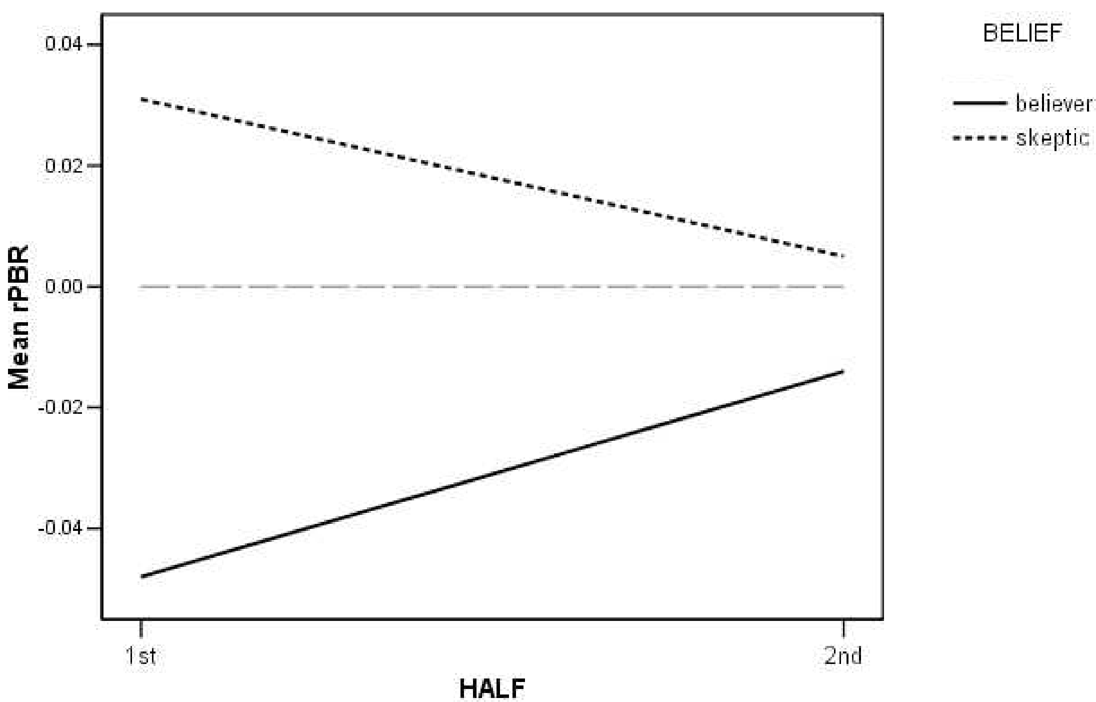

Fig. 2 Mean relative pro-bias responding in the 1st and 2nd halves of the random run of Experiment 2 as a function of belief.

The ANOVA yielded a significant main effect for belief, $F(1,36) = 4.79$, $p = .035$, which refers to rPBR across the entire random run. Believers revealed significant *counter*-bias scoring in the random run, $M = -.031$ ($SD = .060$), $t(19) = 2.32$, $p = .032$, whereas skeptics scored in the "correct" pro-bias direction, although not significantly, $M = .018$ ($SD = .086$), $t(19) = 0.93$. The effect for the believers was contributed disproportionately by the 4 who were practicing psychics. Their mean score was -.075 ($SD = .058$), $t(3) = 2.59$, $p = .081$. This mean differed from that of the remaining believers, $M = -.020$ ($SD = .057$) to a suggestive degree, $t(18) = 1.73$, $p = .102$.

COMBINED RESULTS

As the procedure was essentially identical in the random runs of the 2 experiments, it is possible to combine the results from these runs, introducing experiment as an additional between-participant factor in the ANOVA. As the only meaningful consistent difference across the 2 experiments in this regard was the sex of the Ps (male in the 1st experiment, female in the 2nd), this factor is best interpreted as a gender factor. The only other difference of note is that about half the Ps in the 1st experiment received levodopa, but as this manipulation had no significant effect on the results from the relevant ANOVA in the random run of Experiment 1 it can be considered inconsequential for the comparison between the experiments.

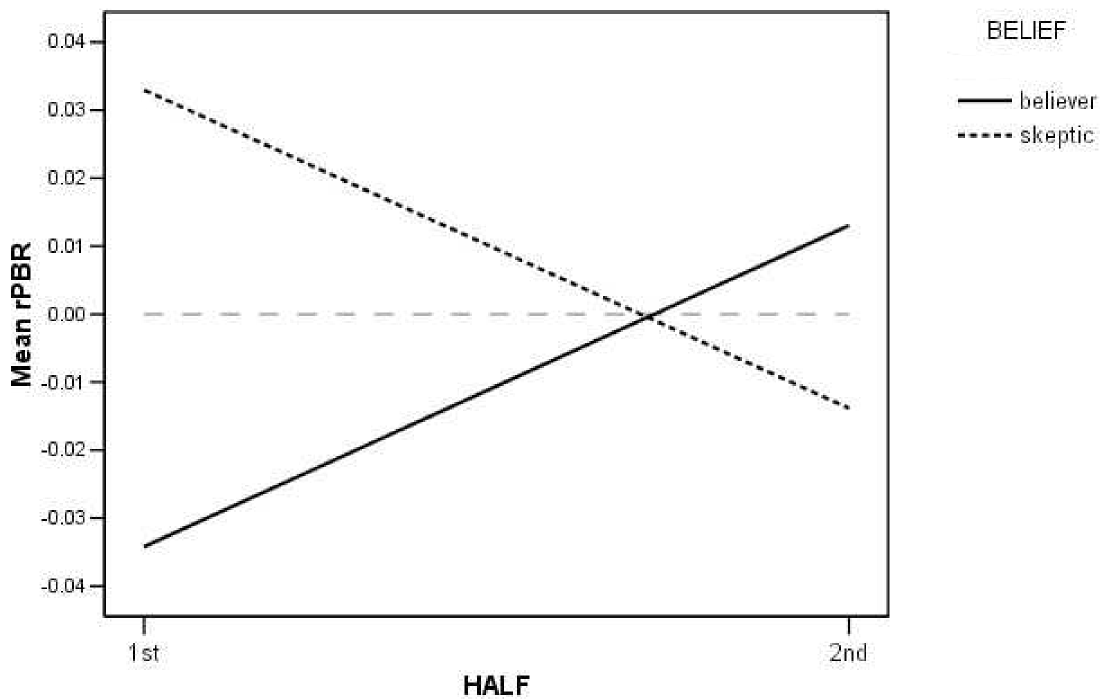

Fig. 3 Mean relative pro-bias responding in the 1st and 2nd halves of the random run of the combined experiments as a function of belief.

As illustrated in Figure 3, the ANOVA yielded a significant belief by half interaction in support of the original AAE hypothesis, $F(1,67) = 7.46$, $p = .008$. Believers scored significantly below chance in the 1st half of the random run ($M = -.034$; $SD = .082$), $t(1,37) = 2.56$, $p = .015$, and nonsignificantly above chance in the 2nd half ($M = .013$; $SD = .117$). The increase was suggestively significant, $t(37) = 1.82$, $p = .075$. Skeptics scored above chance to a suggestive degree in the 1st half of the random run ($M = .033$; $SD = .108$), $t(1,36) = 1.86$, $p = .071$, and nonsignificantly below chance in the 2nd half ($M = -.014$; $SD = .100$).

The decrease is significant, $t(36) = 2.11$, $p = .042$. Finally, the difference in rPBR between believers and skeptics in the 1st half of the run is significant, $t\ (73) = 3.04$, $p = .003$.

GENERAL DISCUSSION

Based on the findings from Experiment 1, it was predicted that in the random run believers would show an increase and skeptics a decrease in RPBR defined with respect to the bias each P would receive in the subsequent biased runs. The hypothesis was not confirmed, although the trends for both believers and skeptics were in the predicted direction. What did emerge from the ANOVA was a significant main effect for belief, such that skeptics demonstrated positive rPBR and believers negative rPBR throughout the random run. Thus, as in the previous experiment, skeptics started out with the "correct" bias and believers with the "incorrect" bias. The difference is that the two groups did not change their strategies in the second half of the run to the same degree as those in the previous experiment. The significantly more positive scores of skeptics compared to believers in the 1st half of the random run in Experiment 1 was significantly replicated in Experiment 2. From the standpoint of the interpretation of the AAE proposed after Experiment 1, this particular effect is the most important test of the AAE.

This interpretation of the AAE is supported even more clearly by the analysis combining the results from the two experiments. The new ANOVA provided no relevant significant results involving the experiment factor, which we interpret as a gender factor. This means that the tendency for females to maintain their strategy throughout the random run more so than males is not a reliable finding. It also means that it is justified to consider the two experiments as a single unit. From the positive standpoint, the combined analysis demonstrated the same AAE interaction found in Experiment 1. This interaction was interpreted as reflecting anomalous information acquisition by Ps about the nature of the bias they would confront in the biased run, but this information was misconstrued as applying to the current (random) run. In response to the lack of positive reinforcement in during the random run, both groups abandoned the strategy in the 2nd half of the random run. The combined results support this interpretation even more elegantly than those from Experiment 1. Compared to Experiment 1 in isolation, the difference in rPBR in the combined experiments between believers and skeptics in the 1st half of the random run is increased, and the crossover in the 2nd half of the run is eliminated, meaning that neither group showed a direct reversal of their previous strategy.

The most puzzling aspect of the AAE in these experiments is the reversal of the traditional sheep-goat effect (SGE), which would lead one to expect that the believers would manifest the positive rPBR and skeptics the negative. If our interpretation is correct that the only anomalous information acquisition occurred in the 1st half of the random run, then exactly the opposite took place. There is a possible social psychological explanation for this reversal. One interpretation of the traditional SGE is that believers score better than skeptics because they are more comfortable in the test situation. This interpretation is credible because most if not all of the positive evidence for the SGE comes from experiments in which the Ps knew that the tester was a believer. Performing a task that highlights such a difference of opinion, especially if the tester is an authority figure such as a teacher -- as has often been the case (e.g., Schmeidler & McConnell 1958/1977) -- would be expected to produce some discomfort in many Ps holding the contrary opinion. In both the previous and current experiments the testers were moderate skeptics. Although neither did anything to overtly expose their beliefs to their Ps, their attitudes could have been reflected by subtle verbal or nonverbal cues that most likely were not consciously identified as such by either P or the tester. This social psychological hypothesis might also account for the fact that skeptics demonstrated a stronger ISL trend between the 1st and 2nd biased runs than did the believers.

The extreme negative AAE by the 4 believers who were professional psychics, although based on a very small *N*, is also consistent with the comfort hypothesis, as persons with such a strong commitment to the paranormal would likely be particularly uncomfortable being tested by a skeptic. The first author has observed that psychics can score significantly below chance if they put themselves under a great deal of pressure to demonstrate their abilities, another cause of discomfort (e.g., Palmer, 1998). In fact, this was the reason he chose to analyze the psychics separately after noticing the overall reversal.

Direct support for the hypothesis that experimenter belief can affect the SGE was obtained in an experiment by Lovitts (1981), in which the traditional SGE was reversed when subjects were tested by an apparently skeptical experimenter who led them to believe that successful results would confirm a hypothesis (subliminal perception) contrary to ESP. However, an attempted independent replication of the experiment was not successful, although the results were consistent with a secondary finding of Lovitts that confirmation of her hypothesis was driven by the female sheep and male goats (Lawrence, 1990-1991).

The AAE differs from the traditional sheep-goat effect in that it manifested as a response to the global structure of the targets within the run rather than to the targets on individual trials. Such global responding is consistent with decision augmentation theory, which claims, with some empirical support, that such global perception of patterns contributes to how participants succeed even on guessing tasks with random target sequences -- that is, by pre-selecting "biased" subsections of true random number streams and injecting a corresponding bias into their responses (May, Spottiswoode, Utts, & James, 1995; May, Utts, & Spottiswoode, 1995).

With respect to global responding, the AAE is reminiscent of results from an experiment in which a psychic was asked to guess the target order in concealed decks of 25 ESP cards in which the conventional restriction of 5 of each of the 5 geometric symbol alternatives was replaced by a regimen of 9-7-5-3-1, for example, 9 crosses instead of 5 crosses (Child & Kelly, 1973). Otherwise the target orders in these "unbalanced decks" were random, and the participant received no trial-by-trial feedback. The authors found a significant tendency for the participant to overcall the 7-symbol and undercall the 3-symbol. However, an attempted replication with the same participant many years later failed to produce significant results (Palmer, 1998). The AAE is also conceptually similar to the so-called presentiment effect, manifested as a precognitive electrodermal response (Bierman & Radin, 1997; Radin, 1997a; May, 2004; Spottiswoode & May, 2003), with one failure to replicate (Broughton, 2004), and as a precognitive behavioral response to emotionally evocative stimuli that participants view subsequently (Bem, 2003). In both the AAE and the presentiment effect, participants make responses that seem to reflect foreknowledge of stimuli to be presented to their senses shortly thereafter. However, in the presentiment studies the visual stimuli follow the precognitive responses by just a few seconds, whereas in the present experiment the lag was much longer. There is ample evidence that anomalous perception effects can occur in the absence of intention on the part of participants to produce them, as well as the absence of any relevant conscious cognitions (Palmer, 1997).

References

Bem, D. J. (2003). Precognitive habituation: Replicable evidence for a process of anomalous cognition. *Proceedings of Presented Papers: The Parapsychological Association 46th Annual Convention*, 6-20.

Bierman, D. J., & Radin, D. I. (1997). Anomalous anticipatory response on randomized future conditions. *Perceptual and Motor Skills*, *84*, 689.

Blackmore, S., & Moore, R. (1994). Seeing things: Visual recognition and belief in the paranormal. *European Journal of Parapsychology*, *10*, 91-103.

Broughton, R. S. (2004). Exploring the reliability of the "presentiment" effect. *Proceedings of Presented Papers: The Parapsychological Association 47th Annual Convention*, 15-26.

Brugger, P., Regard, M., Landis, T., Cook, N., Krebs, D., & Niederberger, J. (1993). “Meaningful“ patterns in visual noise: Effects of lateral stimulation and the observer’s belief in ESP. *Psychopathology*, *26*, 261-265.

Brugger, P., & Taylor, K. I. (2003). ESP: Extrasensory perception or effect of subjective probability? *Journal of Consciousness Studies*, *10*(6-7), 221-246.

Campbell, J. J. (2000). Neuropsychiatric assessment. In C. E. Coffey & J. L. Cummings (Eds.), *Textbook of geriatric neuropsychiatry* (pp. 109-124). Washington, DC: American Psychiatric Press,.

Child, I. L., & Kelly, E. F. (1973). ESP with unbalanced decks: A study of the process in an exceptional subject. *Journal of Parapsychology, 37*, 278-297.

Colwell, J., Schroder, S., & Sladen, D. (2000). The ability to detect unseen staring: A literature review and empirical tests. *British Journal of Psychology, 9*, 71-85.

Eckblad, M., & Chapman, L. J. (1983). Magical ideation as an indicator of schizotypy. *Journal of Consulting and Clinical Psychology, 51*, 215-225.

Hikosaka, O., Takikawa, Y., & Kawagoe, R. (2000). Role of the basal ganglia in the control of purposive saccadic eye movements. *Physiological Review, 80*, 953-978.

Honorton, C. (1987). Precognition and real-time ESP performance in a computer task with an exceptional subject. *Journal of Parapsychology, 51*, 291-320.

Krummenacher, P. (2003). *Predicting the future from the past: Paranormal belief, dopamine, and implicit sequence learning*. Unpublished masters thesis, University of Zürich, Switzerland.

Lawrence, T. R. (1990-1991). Subjective randomization and the reversed sheep-goat effect: A failure to replicate. *European Journal of Parapsychology, 8*, 131-144.

Lawrence, T. R. (1993). Gathering in the sheep and the goats…A meta-analysis of forced-choice sheep-goat ESP studies, 1947-1993. *Proceedings of Presented Papers: The Parapsychological Association 36th Annual Convention*, 75-86.

May, E. C., Spottiswoode, S. J. P., Utts, J. M., & James, C. L. (1995). Applications of decision augmentation theory. *Journal of Parapsychology*, *59*, 221-250.

May, E. C., Utts, J. M., & Spottiswoode, S. J. P. (1995). Decision augmentation theory: Applications to the random number generator database. *Journal of Scientific Exploration*, *9*, 453-488.

Neppe V. M. (1983). Temporal lobe symptomatology in subjective paranormal experients. *Journal of the American Society for Psychical Research, 77*, 1-29.

Palmer, J. (1996). Evaluation of a conventional interpretation of Helmut Schmidt's automated precognition experiments. *Journal of Parapsychology, 60*, 149-170.

Palmer, J. (1997). The challenge of experimenter psi. *European Journal of Psychology, 13*, 110-125.

Palmer, J. (1998). ESP and RNG PK with Sean Harribance: Three new studies. *Proceedings of Presented Papers: The Psychological Association 41st Annual Convention*, 124-134.

Peigneux, P., Maquet, P., Meulemans, T., Destrebecqz, A., Laureys, S., Degueldre, C., et al. (2000). Striatum forever, despite sequence learning variability: A random effect analysis of PET data. *Human Brain Mapping, 10,* 179-194.

Radin, D. I. (1997). *The conscious universe: The scientific truth of psychic phenomena*. New York: HarperEdge.

Radin, D. I. (1997a). Unconscious perception of future emotions: An experiment in presentiment. *Journal of Scientific Exploration, 11*, 163-180.

Rosenthal, R. (1966). *Experimenter effects in behavioral research*. New York: Appleton-Century-Crofts.

Sadler R. M., & Rahey S. (2004). Prescience as an aura of temporal lobe epilepsy. *Epilepsia, 45*, 982-984.

Schmeidler, G. R., & McConnell, R. A. (1977). *ESP and personality patterns*. Westport, CT: Greenwood Press. (Original work published 1958)

Schmidt, H. (1969). Precognition of a quantum process. *Journal of Parapsychology, 33*, 99-108.

Schultz, W., Dayan, P., & Montague, P. R. (1997). A neural substrate of prediction and reward. *Science, 275*, 1593-1599.

Spanagel, R., & Weiss, F. (1999). The dopamine hypothesis of reward: Past and current status. *Trends in Neuroscience, 22*, 521-527.

Spottiswoode, S. J. P., & May, E. C. (2003). Skin conductance prestimulus response: Analyses, artifacts, and a pilot study. *Journal of Scientific Exploration*, *17*, 617-641.

Stadler, M. A., & Frensch, P. A. (Eds., 1998). *Handbook of implicit learning*. Thousand Oaks, CA: Sage Publications.

Thalbourne, M. A., & Delin, P. S. (1993). A new instrument for measuring the sheep-goat variable: Its psychometric properties and factor structure. *Journal of the Society for Psychical Research, 59*, 172-186.

Wolfradt, U., & Straube, E. R. (1998). Factor structure of schizotypal traits among adolescents. *Personality and Individual Differences, 24*, 201-206.

Vassy, Z. (1986). Experimental study of complexity dependence in precognition. *Journal of Parapsychology, 50*, 235-270.

EXPLORING PSYCHOMANTEUM AS A PSI-CONDUCIVE STATE OF CONSCIOUSNESS

Alejandro Parra and Jorge Villanueva
Institute of Paranormal Psychology
Salta 2015 (C1137ACQ) Buenos Aires,

Argentina

ABSTRACT

The mirror gazing procedure termed the "psychomanteum" was developed by the world renowned psychiatrist Dr. Raymond Moody. It was designed to facilitate reunion experiences with deceased individuals, as a means of addressing the feelings surrounding bereavement. Although the modern psychomanteum is not normally employed to seek ESP information about the future, it may be that the psychomanteum is psi-conductive. For example, there are many similarities and differences between psychomanteum experiences and accounts of hypnagogic/hypnopompic imagery, which is conducive to ESP. The aim is of this paper was to explore whether the psychomanteum technique encourages a psi-conducive state of consciousness, which would result in scoring that is significantly above MCE. One hundred and thirty participants (92 females and 38 males; Mean age= 47.44) were recruited by announcements in newspapers and our web site. Seventy eight percent claimed to have had a variety of ESP experiences. A number of variables, such as vividness of imagery and hallucinatory experience, were examined. Two conditions, psychomanteum and no-psychomanteum condition, were compared. A CD-pool containing 200 high-quality color pictures, such as animals, icons, foods, people, landscapes, religion, scenic pictures, structures, and humoristic cartoons, were designed using a RNG for randomization. Under psychomanteum condition, psi-hitting was obtained (30.8% above MCE); however, under no-psychomanteum ("control") condition, 29.2% was obtained (where 25% was expected). The results differ slightly from MCE in the psychomanteum condition (p= .02, one-tailed) in comparison with no-psychomanteum condition, but no significant differences were found. A number of positive correlations were also found, for instance, participants who attained higher scores on auditory and visual hallucinations tended to demonstrate psi-hitting.

INTRODUCTION

Beginning in very remote times indeed, certain individuals see remarkable visions when gazing into the clear depth of a mirror, the still surface of a clear pond, or a crystal ball. These visions are eidetic; that is, they are projected into the visual space and are seen as though they are externally located. The imagery assumes an apparent size proportional to the size of the speculum, small images being seen in small speculums, and large images in large ones. The crystal gazer has a sense that the visions appear and proceed independently of his or her conscious volition. Crystal gazing, as scrying, came to be used for divination: fortune telling, seeing events taking place at a great distance, locating lost objects, and criminal detection (for a discussion of the history see Thomas, 1905; Hyslop, 1896).

Divination by crystal gazing was practiced among the Ojibwa, Apaches, Cherokees, and other Native American groups. The chief oracle of Tibet used a magic scrying mirror to divine the future, and the cabinet ministers took his visions into account in directing state policy. In medieval Europe, *specularii* traveled from town to town telling fortunes by mirror gazing (Besterman, 1965; Kieckhefer, 1989). Gurney, Myers and Podmore (1886), in *Phantasms of the Living,* report hallucinations (apparitions) of faces in a polished surface of a wardrobe and in a window. People also reported colors and flashes of light, but these were not formed into images. It may be that these images seen by people could be developed into more complete and long lasting images, perhaps with symbolic meaning. The phenomena reported seem generally similar to those found by Roll and Braun (1995) and Radin and Rebman (1995).

This mirror gazing procedure termed "psychomanteum" was developed by psychiatrist Dr. Raymond Moody (Arcangel, 1994; Arcangel, 2005; Moody, 1992; Moody with Perry, 1993, Moody & Arcangel,

2001) who authored the best-selling book *Life after Life* (Moody, 1975) at the seventies. It was designed to facilitate reunions with deceased individuals, as a way of addressing feelings of bereavement. Moody conducted clients through a process of remembrance and counseling combined with the mirror-gazing, and reported that about 50% of the participants believed they had a reunion with a loved one. Some of these reunion experiences involved apparent apparitions of the deceased person, both in the mirror and externally in the room. The apparitions that appear in the Psychomanteum may be similar to crisis and other apparitions that have been the topic of parapsychological theory and research, and the question of survival after death (R. Moody, personal communication, June 3, 1995). Moody has directly observed more than 300 individuals during psychomanteum experiences and interviewed them afterwards about their experiences. Based upon this work, he concluded that crystal gazing can be a helpful technique in tapping into one's creative potential and as an aid to self-understanding. According to Dr. Moody's files, several people reported using their experiences as a part of a process of psychotherapy, for example in ferreting out conflictual issues and even in recovering repressed early trauma.

Several visual images are usually seen in the mirror. These included black robed figures, animal faces, flowers, a starry night, a landscape, and faces. These may be similar to imagery seen in crystal gazing and the uses of mirrors by shamans and priests, where images are seen to form in the reflective surface (Lang, 1910; Myers, 1903). Some people report that these apparitions are accompanied by electrostatic sensations (prickling skin, hair standing up), changes in ambient temperature (typically to extreme cold), or illumination anomalies (sparkling lights, the whole room diffused with bright light) (Moody & Perry, 1993). The experience of seeing an apparition can also be accompanied by feelings of profound meaning, sometimes leading to significant transformations of personality. These dramatic effects are reminiscent of phenomena associated with peak experiences and mystical states (Ludwig, 1966). The psychomanteum experience appears generally to be beneficial and may help the grieving process, even if strong reunion experiences are not reported (Hastings *et al.,* 1999; Moody, 1994; Roll & Braun, 1995). Research has also found that widows and widowers who report some form of contact with their deceased spouses, in a non-psychomanteum context, generally find them helpful (Rees, 1971).

Radin (2001) noted at least five possible hypotheses about the psychomanteum, one of which is the telepathic hypothesis. Intense telepathic rapport may affect brain functioning, causing the telepathic communication to be perceived as though it was projected from outside the body. Sometimes this may take the form of the "sender's" image, as is often reported in cases of crisis telepathy (Gauld, 1977). Other hypotheses are neurological, perceptual, psychokinetic and the ghost hypothesis. In recent years, a number of researchers have employed psychomanteum chambers to try to facilitate reunions between participants and their deceased loved ones (Hastings et al., 1999; Moody, 1994; Moody with Perry, 1993; Radin & Rebman, 1996; Roll & Braun, 1995; Moody & Arcangel, 2001).

One possible explanation for psychomanteum apparitional experiences is that they involve hypnagogic-like imagery whose content may be strongly influenced by the needs, motivations and expectations of the participants. Hypnagogic/hypnopompic imagery is that which occurs during the transition states between sleep and wakefulness (see Mavromatis, 1987; Schacter, 1976). However, the main difference between psychomanteum imagery and hypnagogic/hypnopompic imagery is that in the former case the participant presumably has his/her eyes open whereas in the latter case the participant may or may not have his/her eyes open. Another difference is that, unlike hypnagogic/hypnopompic imagery, psychomanteum experiences do not tend to feature non-verbal auditory imagery. Psychomanteum experiences also seem to be more interactive, more emotional and have more of an impact on the participants (see Sherwood, 1998, 2000). The hypnagogic-like imagery could be psi-conductive. Further research is needed to investigate the potential influence of participants' mental set and expectations on the content of psychomanteum experiences with psi. As an altered state of consciousness (Braud, 1978; Honorton, 1974), there are many similarities and differences between psychomanteum experiences and accounts of hypnagogic/hypnopompic imagery.

Like other forms of sensory deprivation, psychomanteum stimulation would be associated with increased attention to internal imagery. Investigators suggested this association to develop an "experimental-hypnagogic" technique to facilitate the study of hypnagogic imagery. Studies of sensory deprivation suggest that perceptual isolation effects are related to the length of isolation. This appears to be particularly true in the case of the psychomanteum technique. For example, the result of ganzfeld stimulation is the experience of diffuse, unpadded light characterized by reports of being immersed in a “sea of light,” disorientation, and the occurrence of “blank out” periods in which there is a complete disappearance of visual experience (Avant, 1965). However, Tart (1978) has argued that we cannot be sure our procedures are actually causing changes in participants' attention states because such changes are not always measured in these studies. The argument is that although some procedures may have a track record of producing ESP, we do not know if an alteration in consciousness has occurred, or to what degree. It is also unclear whether an alteration in consciousness contributes in any way to ESP success.

Irrespective of whether the psychomanteum technique induces a quasi-hallucinatory psi-conducive state, we might learn from the work of the early English psychical researchers in the 1880’s and 90’s. They began to see a new meaning and interpretation in psi hallucinations. The most complete record is found in *Phantasms of the Living*, written in 1886 by Edmund Gurney, Frank Podmore, and Frederic W. H. Myers. In this study Gurney *et al*. characterized the experiences which are today classed as parapsychical hallucinations as “telepathic hallucinations.” The implications of this definition gave experiences of this type their significance for the survival problem since the agency involved was in many instances represented as that of a deceased person.

L.E. Rhine (1953, 1963) found a total of 825 hallucinatory experiences, which she had drawn from a general case collection of over 8,000 items. As such, hallucinations comprised about 10 percent of the total. The remaining 90 percent were dreams and intuitions. When the cases were separated on the basis of sense modality, they fell into four groups: visual, auditory, olfactory, and somatic. The classifying of the types of ESP phenomena represented in the hallucinatory cases involved the sense modalities. However, the decision as to whether these cases were telepathic, clairvoyant, or precognitive in origin depended on what was perceived. That is, on the nature of the event associated with the percipient’s paranormal experience.

This predilection for telepathy in comparison with clairvoyance was the result of an assumption as to the way in which telepathy works. With this concept of the telepathic process, psi hallucinations took on peculiar significance: hallucinatory psi experiences were a once frequently discussed and debated topic. In fact, terms like *ghost* and *apparition* –however– appear again and again in the older literature. Since all experiences that led to terms like *vision, ghost*, or *apparition*, have one common characteristic, that of being taken for sensory experience, but without the presence of an objective stimulus, they fall by definition into the general broad class of hallucinations. This class includes experiences varying in character and origin from the pathological to the religious. The perspective of parapsychologists is different from the rest in one essential aspect. Even though no objective stimulus is within sensory range, a stimulus does exist which could be accessible to extrasensory perception. It is interesting to note that experiences which are reportedly shared by two or more people are also categorized under psi hallucinations.

When applied to a parapsychical occurrence, the word hallucination has not always meant exactly what it does today. Before the discovery of any of the extrasensory phenomena – telepathy, clairvoyance, or precognition– such occurrences could not have been defined in terms of psi. Hallucinatory parapsychical experiences can be defined as the expression of the sensory equivalent of impressions received by extrasensory means. Hallucinations are one of the four forms of spontaneous experiences, the others being intuitions, and unrealistic and realistic dreaming (Rhine, 1953, 1963).

Our study compared psi performance in the psychomanteum with performance in an equivalent non-psychomanteum condition. It also explored ASC in the psychomanteum as a potentially psi-conducive state of consciousness. We hypothesized a (1) significant difference between scoring in the psychomanteum and the non-psychomanteum condition in a positive direction for the psychomanteum condition. Our rationale was that (2) if the psychomanteum truly induces a non-ordinary state of consciousness, this would increase ESP scores, and the presence and intensity of a non-ordinary state of consciousness could be related with ESP hits. It was decided in advance that we would conclude that this experiment offers support for the claim that psychomanteum stimulation is psi conducive only if there was a significant difference between the psychomanteum and the non-psychomanteum condition.

METHODS

Participants

The sample included 130 participants, of which there were 92 females (71.4%) and 38 males (28.6%). Ages ranged from 19 to 75 years (M= 47.44; SD= 12.02). Participants were recruited by announcements in newspapers and magazines and our web site in order to request an admission interview for the psychomanteum session. The participants did not receive information about characteristics related to the hypothesis of the experiment. As a part of the recruiting procedure, participants filled out a consent form.

Instruments

Betts's Vividness of Imagery Scale (Richardson, 1969). We used the Spanish-speaking version of this scale (López, Paino, Martinez, Caro, Lemos, 1997) (Cronbach´s α = .77). This contains 35 short descriptions, from which participants must try to imagine employing the seven different sensory modalities: visual (i.e. "the sun as it is sinking below the horizon"), auditory ("the mewing of a cat"), cutaneous ("the feel of sand"), kinetic ("reaching up to high shelf'), gustatory ("taste of oranges"), olfactory ("the smell of new leather") and organic ("the feeling of a sore throat"). The vividness of each experience was rated on a 7-point Likert scale. This ranged from a maximum score of 1 to a minimum score of 7, as such, lower scores reflect higher vividness experiences. The Auditory and Visual imagery scales were used for analysis.

Barrett's Hallucinations Questionnaire (Barrett and Etheridge, 1992, Barrett and Etheridge, 1994; Barrett, 1993). We used the Spanish-speaking version of this scale (López, Paino, Martinez, Caro, Lemos, 1997) (Cronbach´s α = .93). This assesses 22 different types of hallucinatory experiences, such as hearing one's own name when nobody is present, hearing one's own thoughts aloud, hearing voices coming from a place where nobody is there, or hearing voices belonging to dead friends or relatives. The item is separated by a 5-point Likert scale, rated from 1 (never) to 5 (very often). The Auditory and Visual hallucination scales were used for analysis.

Phenomenology of Consciousness Inventory, PCI (Pekala, 1991b): The American version was translated into Spanish by the authors. Information about its reliability and validity was not given. This is a 53-item inventory that maps 12 major and 14 minor dimensions of participants' experience. They include the following sub-dimensions (in parentheses): positive affect (joy, sexual excitement, love), negative affect (anger, sadness, fear), altered experience (body image, time sense, perception, meaning), imagery (amount, vividness), attention (direction, absorption), self-awareness, altered state of awareness, internal dialogue, rationality, volitional control, memory, and arousal. An example of a PCI item for altered state of awareness is "My state of awareness was not unusual or different from what it ordinarily is" versus "I felt in an extraordinarily unusual and non-ordinary state of awareness." Each dipole of the item is separated by a 7-point Likert scale that participants use to evaluate their experience. With the PCI we rated the *psychomanteum* experience of the sample and the time period in question by means of statements like the one shown below: 1. *Sensations*: are internal bodily impressions that you become aware of. Itches, pressure, pain, warmth, and coldness are examples of such sensations; 2. *Perceptions*: are impressions that you feel you receive from the external world. Perceptions come from the environment through sights, sounds, smells, etc.; 3. *Feelings or Emotions*: are those internal impressions or moods such as happiness, joy, anger, excitement, etc.; 4. *Thoughts*: are internal words, statements, and verbalizations that you are saying to yourself.; 5. *Images or Imagery*: are internal visual (sights), auditory (sounds), kinesthetic (bodily), olfactory (smells), tactual (touch), or gustatory (tastes) impressions or pictures which pass before your mind, no matter how vague or dim they may be. They originate within you instead of coming from the environment; 6. *Impressions or Events*: are any of the above, i.e., sensations, perceptions, thoughts, or images.

Sender and Experimenter

The first author (AP) was the experimenter, who met and ran each participant in the study. The second author (JV) was sender to the entire sample. Each session was carried out in two trials per participant (psychomanteum/non-psychomanteum condition). The sender had taken part in other ESP studies as a sender (Parra & Villanueva, 2003a, 2003b, 2004) and knows meditation and imagery–techniques.

Psychomanteum Chamber

The chamber is a space of 4 meters' squared with a 2.35 meter ceiling. The chamber is built within this larger room, with dimensions of 6 by 8 feet and an 8 foot ceiling, and it has no windows, the ceiling and two walls faced the outside (i.e., had no common walls with other rooms). It is located above a storage room. To help create an isolated, undisturbed setting, the selected chamber room is in a remote, second floor area of our laboratory building at the Institute of Paranormal Psychology in Buenos Aires. The walls and ceiling of the lab are painted matte black to reduce light reflections. The chamber itself is electromagnetically shielded.

The walls of the psychomanteum chamber were constructed out of 2 inch x 4 inch wood studs, 5/8 inch wood studs, 5/8 inch wallboard, and R11 Fiberglas insulation. To form a rudimentary electromagnetic shield inside the chamber, the floor, walls and ceiling are completely covered with aluminum insulation, and then checked throughout for electrical continuity. The insulation consisted of a sheet of 1/16**,** 99 percent pure aluminum, a quarter-inch air spacing consisting of plastic bubble wrap, and then another sheet of 1/16 aluminum. The walls and ceiling of the chamber are covered by black velveteen fabric to create a dark, featureless interior, and the floor is covered by a black carpet.

A reclining chair and a wall mirror (1x1 meters) were brought inside the chamber and positioned for optimum comfort and viewing angles. Because the chamber is essentially a darkroom, a dim incandescent reclining chair lamp was placed behind the reclining chair, facing down, to provide some illumination so the participant could see the mirror. A dimmer control for this lamp can be operated outside the chamber to adjust illumination levels.

Type of Targets

A CD-pool containing 3,500 color pictures of high-quality were designed from many collections of CDs clip-art. For each participant one picture-target randomly selected was used. A personal computer Pentium© IV (Intel©), 2.4 GHz, 512 RAM, 30 Gb. hard disc with SVGA color screen, PC-system video 8Mb, 3D AGP and a CD ROM reader 56X owned by the Institute of Paranormal Psychology was used.

Targets

A CD–Rom contained 3,500 high–resolution jpg pictures was used. All pictures were taken from a clip-art, which contained nine groups of irregular, well differentiated pictures, such as animals, icons, foods, people, landscapes, religion, scenic pictures, structures, and humoristic cartoons. AP, selected approximately. 200 attractive pictures from each group according to the original clustering of the product. He designed a pool where all pictures of each subgroup were numbered from 1 onward. An individual who had no contact with the participants and the sender and almost none with the experimenter, used a random number generator to separately and sequentially select pictures within each subgroup. After this, AP delivered the CD to JV with the pictures re-clustered and divided by groups, who then randomly selected one picture (as target) and after that three decoys. The picture target came from different subgroups (for example, a horse from the subgroup animals, a baby sleeping with his mother from the subgroup people, a church from the subgroup religion, and Popeye and Olive from the subgroup 'humoristic cartoons'). The target was selected once the experimenter (AP) and participant had entered the psychomanteum chamber. The three decoys were selected before AP and the participant came into the sender's room. During this procedure, the sender remained alone in his room. A standard coding of digits was used for all participants according to their testing numbers (determined by the order of testing).

When both conditions (psychomanteum and control) were complete, a randomization procedure for judging was used by JV for displaying the three decoys and the target picture. Avoiding any preference effect, a value (1–4) was randomly assigned by the sender for the target picture. Photoshop 5.0 was used for display four pictures at the same time because it did not allow any sensory cues between participant and experimenter, after the sender had finished viewing the target image on the PC screen. Both procedures were blind to AP and target pictures were never printed on paper. This procedure was employed for five reasons: 1. picture subgroups are easily clustered; 2. it facilitated randomization process; 3. target pictures were characterized by their diversity and visual attraction to serve as a good target for a GESP experiment; 4. this avoided any sensory (visual) cues, 5. Finally, this avoided any manipulation of the target, mainly during the target-viewing and judging stages.

Target security

JV made the selection of the targets for each participant (each condition) individually, prior to each session, but he kept a paper-and-pencil register of the names of each participant and picture-targets selection, which was never in contact with AP (a security copy was kept by JV in a safe place unknown to the experimenter). JV kept the register in a close envelope with him. Before each condition JV remained alone in the sender's room, when he prepared each target. This procedure protected against the (unlikely) possibility of any leaking of target information to AP. The experimenter did not access the sender's room (JV) before and during the psychomanteum session. Both were separately isolated in different rooms (see Figure 1).

Also, the experimenter did not show the sender's room to the participant prior to the psychomanteum test. The experimenter had no contact with the sender during picture-target viewing period, as he left the room prior to the selection of the target picture by the sender.

The distance between sender and participant, as well as the walls of the Institute, and the design of the Psychomanteum chamber is optimal and safely isolated. As such, there could not have been any communication of sensorial clues either intentionally or unintentionally.

Test instructions

Descriptions of the experiment were given to the participants. Participants were told that the experiment was a telepathy experiment with two conditions: psychomanteum and a non-psychomanteum condition. Both conditions were said to stimulate psychic abilities in people. They were told that both situations were being explored in this research project, such that the relative importance of each for stimulating psychic abilities could be investigated.

Altered state manipulation

In the psychomanteum condition, participants undergo a 9–minute recorded relaxation exercise before the target-viewing period, which included autogenic phrases (Jacobson, 1974). This was recorded using the voice of one of the experimenters (AP). The participant was positioned in the reclining chair directly in front of the wall mirror. The instructions and relaxation exercises were delivered in a slow, soothing but confident manner with classical music [Antonio Vivaldi's *Double concerto*, Largo G Minor] in the background. The auditory stimulation was given by a 33-minute, white-noise, CD generated for this experiment.

In the non-psychomanteum condition, the experimenter was indicated that participant "remained with eyes closed, quiet, waiting for mental impressions for a twenty-three minute period." Participants also freely chose a relaxation technique. Neither music or white noise were used.

Randomization

All randomization procedures were carried out using a Random Event Generator (REG). The sender was blind to the experimental condition. For counterbalancing the psychomanteum/non-psychomanteum conditions ABBA was employed (being A= psychomanteum condition and B= non-psychomanteum condition; B= non-psychomanteum condition and A= psychomanteum condition).

Testing Procedure

Participants received an information pack before the session. It included a 4-item previous psi experience questionnaire designed by the authors. General information on the research program was also delivered. AP greeted participants at the door when they arrived and attempted to create a friendly and informal social atmosphere. AP engaged in conversation with the participants before the session. The experimenters sought to encourage a positive expectation for the selection of the target picture among participants.

Both conditions were carried out in separated rooms, one of them using free-response technique under psychomanteum stimulation and other one using a non-psychomanteum, both conditions used a free-response methodology. Both conditions were counter-balanced for each participant, who visited to the psychomanteum chamber just one time. The sender was not aware which condition the experimenter had randomly assigned.

In both conditions, the experimenter left the room once the experiment began and returned when the target viewing period ended. In both conditions, the experimenter remained silent in room B to control the session period using a chronometer. The participant stayed in the session room and the experimenter indicated the target-viewing period twice to the sender using a caller (a sound gadget which emits a *one–bip*). This indicated the beginning and the end of the viewing period. The target picture remained on the computer screen for twenty-three minutes.

Each participant was asked to verbalize his mental impressions as much as possible following the psychomanteum, which were then tape-recorded by the experimenter. Many people felt better speaking after rather than during psychomanteum (as Moody recommended). As participants did not have to verbalise during the session, the collection of mentation information was improved as it could be transcribed directly from a tape recording. Then, both experimenter and participant went into the sender's room. When the participant was seated in front of the computer's screen, a judgment procedure began.

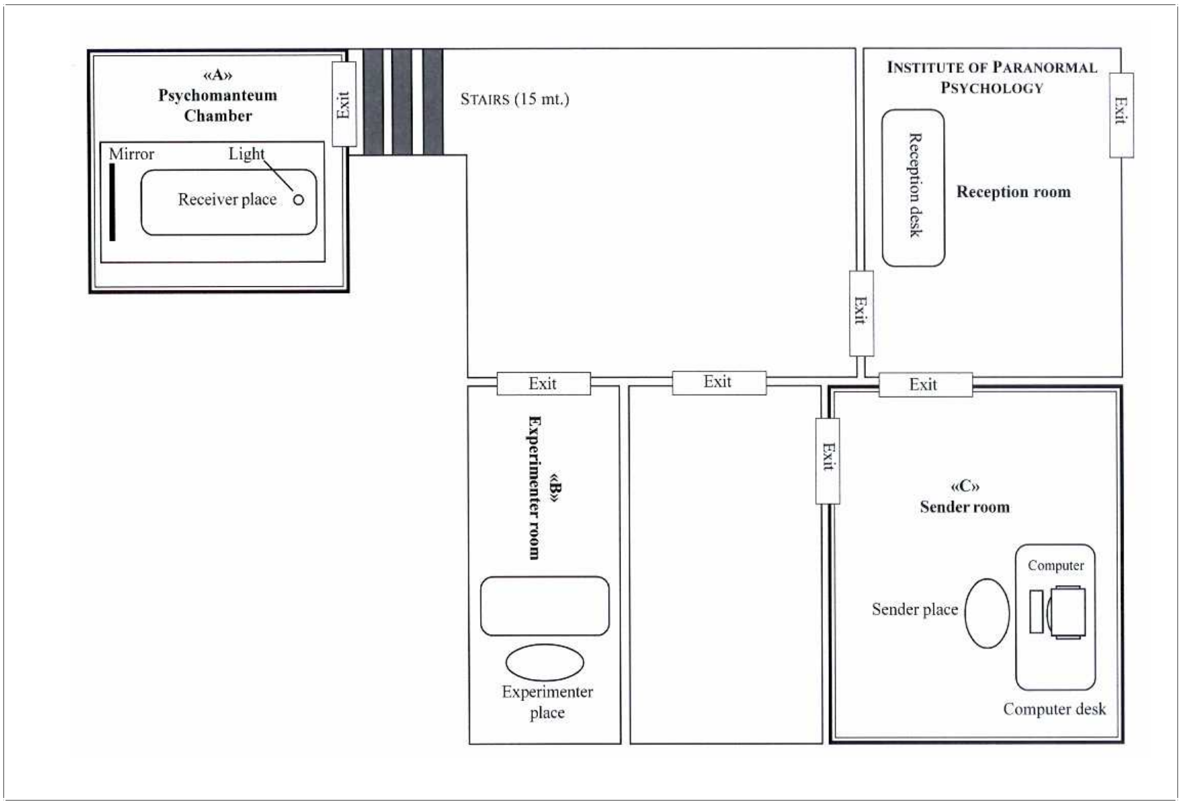

Figure 1 Psychomanteum Chamber

Psychomanteum condition

The experimenter remained in room B, so that he had no contact with the sender during the observation of the target. The target remained on the computer's screen for twenty minutes, while being viewed by the sender. Using a caller (a sound gadget which emits a *bip*), the experimenter communicated to the sender the beginning–end of the "viewing" period of the target. Immediately after the psychomanteum session, each participant was asked to verbalize his/her impressions as much as possible. They were audio-taped by the experimenter.

Non-psychomanteum condition

The participant was placed in room A. No light under the reclining chair was used during the no-psychomanteum period. The mirror was also covered using a blackboard. The experimenter also had no contact with the sender. The sender observed the target, which was displayed on the computer's screen for the same duration as for the psychomanteum session. Again, using a caller, the experimenter communicated to the agent the beginning–end of the "viewing" period of the target. Within no-psychomanteum condition the participant´s mentation was not audio-taped.

Judgment procedure

The participant viewed the four potential targets (the actual target and three decoys on the computer screen), which were presented in one of four random placed at the computer screen. The participant, viewed each possibility and associated to the picture as though it were the actual target, describing perceived similarities between the item and the impressions experienced in the psychomanteum. Ranks were allocated as follows: rank 1 represents the highest coincidence with the potential target and 4 represents the lowest (or null) coincidence. Scores 2 and 3 represented "mid-scores". Both conditions were not compared to one another. The judgment procedure lasted between five and ten minutes (according to each participant) for both conditions (psychomanteum/no-psychomanteum). The forms were individually signed by each participant.

RESULTS

The aim of this research project was to explore whether the psychomanteum technique is a psi-conducive state of consciousness more than chance expectation. Z-score test was used to determine if a significant relationship exists between psychomanteum and no-psychomanteum condition. It was hypothetized that this experiment would offer support in a positive direction for the psychomanteum condition. Table 1 indicates that expected results were better using psychomanteum condition than the no-psychomanteum condition. The *z*-score was also obtained by means of the sum of ranks, however the results were not significant when the results of the psychomanteum were compared with no-psychomanteum condition (see Table 2).

TABLE 1:
DISTRIBUTION OF SCORES: JUDGING PROCEDURE

	Scores					
	1st	2nd	3th	4th	*z* score	*p* (one-tailed)
Expected	25.0	25.0	25.0	25.0		
Observed psychomanteum	30.8 (40)	28.5 (37)	20.8 (27)	20.0 (26)	–2.00	.02
Observed no-psychomanteum	29.2 (38)	23.8 (31)	21.5 (28)	25.4 (33)	–.67	n.s.

* Negative z score indicates score position. First is highest coincidence; fourth is lowest or null. Hits refer to first-place rank (P= .25).

TABLE 2:
COMPARISION BETWEEN PSYCHOMANTEUM AND NO-PSYCHOMANTEUM CONDITION USING WILCOXON RANK TEST

Scores	*Ranks*	*N*	*Mean Score*	*Sum of Score*	*z*	*p*
psychomanteum – no-psychomanteum	NEGATIVE RANKS	41(a)	49.34	2023.00	–.97	n.s.
	POSITIVE RANKS	54(b)	46.98	2537.00		
	TOTAL	130				

a. Ranks no-psychomanteum < Ranks psychomanteum.
b. Ranks no-psychomanteum > Ranks psychomanteum.
Hits refer to first-place rank (p= .25).

DISCUSSION

Our results showed that scoring was better for the psychomanteum condition than the control (non-psychomanteum) condition, although there was no significant difference between the two conditions. We should not conclude that if the "good" ESP results in our experiment using psychomanteum induction were related to a modified state of consciousness or not. As such, even if we could compare the hits in studies using free response with and without psychomanteum (or other techniques), we cannot evaluate with certainty that the hits are related to a modified state of consciousness without being able to measure the extent of this modified state, as these results could be dependent on other variables which are independent of a non-ordinary state.

Our research also attempted to associate ESP scores and the altered state that the technique was presumed to induce. This study did not show a relationship between the main ASC items of the PCI to our psychomanteum hits. We cannot be sure our procedure is actually causing changes in the participants' attention states because such changes cannot always be measured in the studies.

This also raises the controversial question of what a 'no-psychomanteum' condition actually is, if a participant is relaxing in the same place in a quiet room, with eyes closed or with eyes open, sitting upright in a chair or in an ordinary (not soundproofed) room. Moreover, others have mentioned problems such as lack of control groups, a variety of design and individual difference problems, and an alternative (more general) explanation using expectancy effects of different types. The argument is that although some procedures may have a track record of producing ESP, we do not know if an alteration in consciousness has occurred, or at what degree, and if alteration of consciousness contributes in anyway to success in the experiment.

The *Phenomenology of Consciousness Inventory* gave information about the phenomenology of the experience. Some participants indicated psychophysical relaxation, which is consistent with the score for sensation of pleasure about the experience. It is probable that both variables influence the number of hits in the experience. Some participants also reported a consciousness of their bodies. However, some of them indicated not to have experienced changes in their corporal perception, and some said their bodies were lighter, heavier, numb, and out-of-proportion.

In fact, many participants in this sample did not indicate a drastic change in their state of consciousness. Some of them lost the notion of elapsed time (temporal distortion) and less time than normal (i.e. 10 instead of 33 minutes). This also might be in relation with the high score for sensation of pleasure and relaxation during the experience.

Some analysis was performed to determine if a significant relationship existed between auditory and visual hallucination (measured using Barrett´s scale) and psi-hitting in the psychomanteum condition. A number of positive correlations were found. Although it is natural to suppose that visual mental imagery is important for psychomanteum condition and ESP, participants who scored low visual imagery tended to exhibit psi-hitting. However participants who scored higher on auditory (Rho= –.15, p= .09), tactile (Rho= –.20, p= .02), and visual hallucination (Rho= –.16, p= .07) tended to score psi-hitting. Supporting the telepathic hypothesis, perhaps intense telepathic rapport affects brain functioning, causing the telepathic communication to be perceived as though it was projected from outside the body, sometimes in the form of the "sender's" image, as is often reported in cases of crisis telepathy.

It would be interesting to design an experiment in order to explore the psychomanteum protocol independent of the "parapsychological" context, that is, the participants in the psychomanteum should be paired with participants run in the same protocol, but who ignore the fact that they are participating in a psi experiment or have no knowledge that this condition has anything to do with a parapsychological study. Independent judges would be used to evaluate the correspondences. If the effect is sufficiently strong, we should be able to note the functioning of ESP. Undoubtedly, we should assess psi experiences by a brief interview by a qualified person who could give the psi experiences some sort of quality rating. Further research will be needed to investigate the potential influence of participants' mental set and expectations on the content of psychomanteum experiences with psi.

Acknowledgements

We are grateful to BIAL Foundation for its financial support to this research project.

References

Arcangel, D. (1994). *Facilitator's guide to the psychomanteum.* Pasadena, TX: Author.

Arcangel, D. (2005). *Afterlife encounters: Ordinary people, extraordinary experiences.* Charlottesville, VA: Hampton Roads.

Barrett, T. R. (1993). Verbal hallucinations in normals. Part 2: Self-reported imagery vividness *Personality and lndividual Differences, 15,* 61-67.

Barrett, T. R.. & Etheridge, J. B. (1992). Verbal hallucinations in normals. Part 1: People who hear "voices". *Applied Cognitive Psychology, 6,* 379-387.

Barrett, T. R.. & Etheridge, J. B. (1994). Verbal hallucinations in normals. Part 3: Dysfunctional personality correlates. *Personality and Individual Differences, 16,* 57-62.

Besterman, T. (1965). *Crystal gazing*. New York, NY: University Books.

Braud, W. (1978). Psi-conductive states. In B. Shapin & L. Coly (Eds.), *Psi and states of awareness* (pp. 1-34). New York: Parapsychology Foundation.

Gauld, A. (1977). Discarnate Survival. In Wolman, B.B. (Ed.) *Handbook of Parapsychology* (pp. 577-630). New York, NY: Van Nostrand Reinhold.

Gurney, E., Myers, F. W. H., & Podmore, F. (1886). *Phantasms of the living.* London: Tribner.

Hastings, A., *et al*. (1999). Psychomanteum research: Experiential phenomena and effects on feelings about deceased friends and relatives. *Proceedings of Presented Papers at the 42nd Annual Convention of the Parapsychological Association* (pp. 96-111). Halifax, Nova Scotia: Parpasychological Association.

Honorton, C. (1974). State of awareness factors in psi activation. *Journal of the American Society for Psychical Research, 68,* 246-256.

Hyslop, J. H. (1896) Some experiments in crystal-vision. *Proceedings of the Society for Psychical Research, 12,* 259-276.

Jacobson, E. (1974). *Progressive relaxation*. Chicago, Ill: The University of Chicago Press.

Kelly, E, F. & Locke, R. G. (1981) A note on scrying. *Journal of the American Society for Psychical Research, 75,* 221-227.

Kieckhefer, R. (1989). *Magic in the Middle Ages*. Cambridge, England: Cambridge University Press.

Lang, A. (1910). Crystal-gazing. In *Encyclopaedia Brittanica* (11th ed., Vol. 7, pp. 565-568). Cambridge, England: University Press.

Lopez, A.M., Paino, M.M., Martinez, P.C., Caro, M.I. & Lemos, S. (1997). Hallucinations in a normal population: Imagery and personality influences. *Psychology in Spain, 1,* 10-16

Ludwig, A. M. (1966) Altered states of consciousness. *Archives of General Psychiatry 15,* 225 -234.

Mavromatis, A. (1987). *Hypnagogia: The unique state of consciousness between wakefulness and sleep.* London: Routledge & Kegan Paul.

Moody, R. (1975). *Life After Life: The investigation of a phenomenon, survival of bodily death*. New York: Bantam

Moody, R. (1992). Family reunions: visionary encounters with the departed in a modern-day psychomanteum. *Journal of Near-Death Studies, 11,* 83-121.

Moody, R. A. (1994) A latter day psychomanteum. In Bierman, D.J. (Ed.), *Proceedings of Presented Papers at the 37th Annual Convention of the Parapsychological Association* (pp. 335 –336). University of Amsterdam, The Nederlands: Parapsychological Association.

Moody, R., with Perry, P. (1993). *Reunions: Visionary encounters with departed loved ones.* New York, NY: Ivy Books.

Moody, R. & Arcangel, D. (2001). *Life after loss*. San Francisco, CA: Harper/San Francisco.

Myers, F. (1903). *Human personality and its survival of bodily death* (Vols. 1-2). London: Longmans, Green.

Parra, A. & Villanueva, J. (2003a). Inducción a un estado no-ordinario de consciencia como facilitador de la PES: Comparando la PES bajo condición ganzfeld versus una condición no-ganzfeld. *Revista Argentina de Psicología Paranormal, 14,* 161-186.

Parra, A. & Villanueva, J. (2003b). Personality factors and ESP during ganzfeld session. *Journal of the Society for Psychical Research, 67.1,* 870, 26-36.

Parra, A. & Villanueva, J. (2004). ¿Son los temas musicales mejores que los visuales como objetivos de PES?: Un estudio experimental bajo el estímulo de monotonización perceptual ganzfeld. *Revista Argentina de Psicología Paranormal, 15,* 195-208.

Pekala, R. J. (1991a). *The Phenomenology of Consciousness Inventory (PCI).* West Chester, PA: Mid Atlantic Educational Institute.

Pekala, R. J. (1991b). *Quantifying consciousness: An empirical approach.* New York, NY: Plenum Press.

Pekala, R.J. & Cardeña, E. (2001). Methodological issues in the study of altered state of consciousness and anomalous experiences. In E.Cardeña, S.Jay Lynn, & S. Krippner (Eds), *Varieties of anomalous experiences: Examining the scientific evidence.* Washington, D.C.: American Psychological Association.

Radin, D. & Rebman, J. (1995). Are phantasms fact or fantasy? A preliminary investigation of apparitions evoked in the laboratory. *Journal of the Society for Psychical Research, 61,* 65-87.

Radin, D. (2001). Seeking spirits in the laboratory. In J. Houran & R. Lange (Eds.), *Hauntings and Poltergeist: Multidisciplinary perspectives* (pp.164-178). Jefferson, NC.: McFarland.

Rees, W. D. (1971). The hallucinations of widowhood. *British Medical Journal, 210,* 37-41.

Rhine, L.E. (1953). Subjective forms of spontaneous psi experiences. *Journal of Parapsychology, 17,* 77-114.

Rhine, L.E. (1963). Auditory psi experiences: Hallucinatory or physical? *Journal of Parapsychology, 27,* 182-198.

Richardson, A. (1969). *Mental imagery*. New York: Springer.

Roll, W. G., & Braun, B. A. (1995). Psychomanteum research: A pilot study. *Proceedings of Presented Papers: The Parapsychological Association 38th Annual Conv ention* (pp. 438-443). Durham, NC: Parapsychological Association.

Schacter, D. L. (1976). The hypnagogic state: A critical review of the literature. *Psychological Bulletin,* 83, 452-481.

Sherwood, S.J. (1998). Relationship between the hypnagogic/hypnopompic states and reports of anomalous experiences. *Proceedings of Presented Papers: The Parapsychological Association Annual Convention* (pp. 210-225).

Sherwood, S.J. (2000). A comparision of the features of the psychomanteum and hypnagogic/hipnopompic experiences. *International Journal of Parapsychology, 11,* 97-121.

Thomas, N. (1905). *Crystal gazing*. New York, NY: Dodge.

Author contact details: rapp@fibertel.com.ar

ENTRAINED MINDS AND THE BEHAVIOR OF RANDOM PHYSICAL SYSTEMS

Dean Radin[1] & F. Holmes Atwater[2]

[1] *Institute of Noetic Sciences*
Petaluma, CA, USA

[2] *The Monroe Institute*
Faber, VA, USA

ABSTRACT

An experiment was conducted to see whether group mental coherence would produce statistical order in sequences of truly random binary events. Mental coherence was entrained in groups who simultaneously listened to the same binaural beat rhythms for up to six hours a day as part of a six-day workshop. Electronic circuits continuously generated truly random bits during 12 workshops. An additional 12 six-day runs were taken in distant locations during the workshops, and 8 calibration runs were taken when no workshops were taking place. Samples of 200 bits collected during the workshops were normalized against the calibration samples. Analyses were based on the first sample of 200 bits collected per second (12 million samples) and also on all available samples of 200 bits (226 million samples). The first analysis found positive but non-significant deviations from chance; the second showed a significant positive deviation for the workshop RNGs, as predicted (z = 3.27, p = 0.0005, one-tailed), and an unexpectedly strong negative deviation in the distant RNGs (z = -6.47, p = 9.6×10^{-11}, two-tailed). The results support the idea that coherent minds influence local physical randomness.

INTRODUCTION

Field consciousness experiments study a hypothesized mind-matter interaction (MMI) effect associated with "mental coherence" in groups (Nelson, Bradish, Dobyns, Dunne & Jahn, 1996; Nelson, Jahn, Dunne, Dobyns & Bradish, 1998). Mental coherence refers to a felt sense associated with the activities of a group when individual thoughts and actions seem to blend into a single organism. This qualitative sense of coherence or "flow" is sometimes noticed during meaningful religious rituals, heartfelt speeches, and team sports (Csikszentmihalyi, 1990, 1997).

At such times, the attention of the audience or participants seemingly locks onto the "same wavelength," and the group senses a subjective shift. The MMI hypothesis proposes that such felt shifts are associated with physical changes in the local environment, i.e. that when the "mind" side of the MMI connection becomes unusually coherent or ordered, then the "matter" side will also become more coherent or orderly.

To detect the postulated effect, electronic truly random number generators (RNG) continuously produce sequences of random bits (0s and 1s) while groups are involved in highly engaging activities and also during control periods with no group activity. Later the data from the two conditions are compared and the hypothesis predicts that significantly more statistical order will appear in the experimental data. Order is postulated to appear as more 0s or more 1s than one would expect by chance in samples of say, 200 successive random bits. The usual statistic employed is a shift in sample variance rather than a shift in the mean, because an excess of either 0s or 1s in a given sample represents similar forms of statistical order. In the present experiment samples of the first 200 bits generated per second were used as in previous studies, but in addition all 200-bit samples generated per second were used.

Over a hundred such experiments have been reported (see bibliography). While the cumulative data have not been formally examined by meta-analysis yet, informal inspection seems to support the existence of the hypothesized MMI effect. However, the reported results vary widely. Some of the variance is undoubtedly due to differences among groups, contexts, and environments, but it is also due to the uncertainty involved in inferring when mental coherence occurs. To see if a more reliable MMI effect could be produced, we conducted an experiment where the means of producing mental coherence were controlled.

The technique involved the use of binaural-beat tones, in particular the commercially available audio programs known as Hemi-Sync®. Binaural-beat refers to a method in which a tone at say, 400 Hz, is played in one ear while another tone at say, 406 Hz, is played in the other ear. These two tones are heard along with a subjective beat frequency, or warbling tone, of 6 Hz, which is generated by overlapping circuits in the brain's audio cortex (Atwater, 2001; Kuwada, Yin & Wickesberg, 1979; Lane et al., 1998; Oster, 1973). This beat frequency acts to entrain the brain's endogenous rhythms; in this example the binaural-beat would promote a theta rhythm at 6 Hz.

Hemi-Sync® audio programs combine the binaural-beat technique with relaxation techniques, including restricted environmental stimulation, controlled breathing, guided affirmations and visualization. The audio programs are offered in numerous varieties to help promote relaxation, meditation, creativity, etc., as well as to facilitate exploration of expanded states of consciousness (Atwater, 1997).

During the six-day workshops known as the Gateway Voyage® held at The Monroe Institute, groups of 20 to 25 people *simultaneously* listen to a variety of Hemi-Sync® programs for up to six hours a day, over headphones.[1] Each audio program is listened to by each participant in private listening chambers. The simultaneous entrainment this produces among the group is inferred to produce a form of collective mental coherence, similar to how participating in a drumming ceremony entrains the drummers. After listening to a Hemi-Sync® program for about 45 minutes, the group reassembles and discusses their experiences. The group repeats this listening-discussing cycle throughout the day. The workshop is an intensive, full immersion experience designed to generate and sustain an altered state of awareness for six days. Anecdotal reports support the idea that groups involved in this process become tightly bonded over the course of the workshop. We predicted that this environment of mental coherence would result in a shift in the variance of truly random samples.

METHOD

Design

We ran two types of RNGs continuously during Gateway Voyage® workshops held between April 2003 and June 2005. RNGs are hardware circuits designed to reliably produce sequences of truly random bits. Both RNG types used in this experiment have been used extensively in previous MMI research.[2] The randomness in the *Mindsong RNG* derives from electronic noise in a field effect transistor; the randomness in the *Orion RNG* derives from quantum tunneling effects in two independent analog Zener diodes. The Orion's calibration statistics have shown that it produces random bits that closely match theoretical expectation. The Mindsong produces a slightly higher sample variance than expected theoretically.[3]

All of the workshops took place in the same building at The Monroe Institute. In some workshops we used the Mindsong RNG, in others we used an Orion RNG.[4] Two types of truly random RNGs were employed to replicate the test using different sources of randomness. To provide calibration data we ran the same RNGs when no workshops were taking place. We also ran two RNGs in distant locations while

---

[1] Audio was played on a Yamaha Natural Sound HDD/CD Recorder, Model CDR-HD 1300.
[2] See http://noosphere.princeton.edu/rdnelson/reg.html for details, as of February 25, 2006.
[3] See http://noosphere.princeton.edu/gcpdata.html#normalizing for a discussion. Physicist Peter Bancel has examined this issue in detail.
[4] The Mindsong RNG is no longer manufactured; the Orion is available from http://www.randomnumbergenerator.nl/, as of February 25, 2006

the workshops were underway: one about a tenth of a mile away from the workshop, the other about a mile away. These two distant RNGs were in locations away from human activity, and workshop participants did not know of their existence. Some members of the workshops knew that an RNG was running at the workshop location, but it was not in a hidden location and no feedback was provided about its output either during or after the workshop.

Data from each RNG were acquired using Windows-based software that recorded all bits generated by the RNG,[5] about 7,600 bits per second from the Orion and about 2,600 bits per second from the Mindsong. Each six-day recording period resulted in 1 to 4 Gigabits of random data (depending on which RNG was used). Over the combined 32 recording sessions over 66 billion random bits were recorded.

Participants

Each workshop consisted of about 20 men and women, average age 48 (range 16 – 77). Overall, 52% of participants were male, 78% were from the USA and Canada, and the others were mostly from Europe. A wide range of professions were represented; 92% had at least some college education.

Analysis

The basic datum in all analyses was the *sample*, defined as the sum of 200 contiguous random bits generated by an RNG. The first analysis was based on the first sample generated per second, as this has become a standard method used in many previous field consciousness experiments. However, that standard developed mainly due to computational, data collection and storage constraints, and not for any intrinsic analytical reason. Indeed, use of just the first sample of 200 bits per second, when 10 to 30 times more data were actually generated per second, means that most of the data from previous studies were thrown away. Fortunately, today's personal computing hardware overcomes earlier design limitations, so the software used in this study was designed to collected all samples of 200 bits generated by the RNG per second, allowing a new analysis based upon all available samples.

For the first analysis, the first sample per second (x = sum of 200 bits) produced by a given RNG was empirically normalized as $z = (x-\mu)/\sigma$, where μ was the mean and σ the standard deviation of all samples produced by that same RNG collected under calibration conditions. The second analysis was based on all available samples instead of just the first sample per second.

After the z values were formed, the cumulative sum of z^2 (which is chi-squared distributed) was determined for each workshop. This cumulative deviation was transformed into a z-score equivalent as $z = \sqrt{2\chi^2} - \sqrt{2df - 1}$ (Guilford & Fruchter, 1973, p. 517), where df refers to number of degrees of freedom, which is the same as the number of squared z scores.[6] The resulting cumulative z curves for each workshop were then combined with a Stouffer $z = \sum_{i=1}^{i=N} z_i / \sqrt{N}$, where N = number of combined curves.

The MMI prediction was that this Stouffer z would become progressively positive over the course of each workshop. This would reflect an increase in the sample variance as compared to the same value measured under calibration conditions. The same analytical procedures were also applied to the two distant RNGs, but no prediction was made for those outcomes. A custom Microsoft Visual Basic 6.0 program extracted and summarized the binary data files produced by each RNG, and the resulting summary was further analyzed in Microsoft Excel 2003. The results were double-checked with independent analytical programs written in Matlab 7.0.1. The first author conducted all analyses.

[5] We thank Paul Bethke for writing the core data acquisition program, and adding features to the software based on a design by the first author.

[6] This estimate, which is actually a t score with df degrees of freedom, quickly approaches z as df increases.

RESULTS

Data collection began around 11:30 AM on the first day of each workshop, as shown in Table 1. Starting times for the 7 calibration sessions varied, and they ran for either six days or two weeks. No workshops took place during calibration runs.

TABLE 1. TIMES AND TYPES OF SESSIONS. WORKSHOP (E FOR EXPERIMENTAL) REFERS TO RNG RECORDINGS TAKEN IN PROXIMITY TO THE WORKSHOPS AS THEY TOOK PLACE.

Start date/time of data recording	RNG type	Experimental/Control recording
04/26/03 11:33:41	Mindsong	Workshop (E), Near (C), Remote (C)
05/17/03 09:55:23	Mindsong	Workshop (E), Near (C), Remote (C)
07/12/03 11:25:26	Mindsong	Workshop (E), Remote (C)
01/17/04 11:55:33	Mindsong	Workshop (E), Remote (C)
02/21/04 11:08:22	Mindsong	Workshop (E), Near (C), Remote(C)
03/29/04 15:23:51	Mindsong	Workshop (C2, two weeks of data collection)
04/13/04 09:35:40	Mindsong	Workshop (C2, two weeks of data collection)
04/24/04 11:40:23	Mindsong	Workshop (E), Near (C), Remote (C)
05/15/04 10:48:46	Mindsong	Workshop (E), Near (C), Remote (C)
05/29/04 11:13:34	Mindsong	Workshop (C2), Near (C2), Remote (C2)
01/08/05 11:50:19	Orion	Workshop (C2)
02/19/05 11:35:36	Orion	Workshop (E)
02/26/05 10:09:35	Orion	Workshop (C2)
04/09/05 11:43:58	Orion	Workshop (E)
04/23/05 11:37:46	Orion	Workshop (E)
05/07/05 11:10:58	Orion	Workshop (E)
06/04/05 11:25:36	Orion	Workshop (E)
07/02/05 11:57:58	Orion	Workshop (C2)

Near (C for concurrent control) and Remote (C) refer to distant RNGs run during the workshops. C2 indicates a calibration recording for an RNG when no workshops were taking place. Unless otherwise noted, each record consisted of six days of continuous data collection.

Figure 1 shows the cumulative empirical z curves for the two workshop and two distant RNGs based on the first sample per second (see Appendix for more details). Two significant deviations (meaning the terminal z scores exceeded 1.65) were observed in the 12 workshop runs, and no significant deviations were observed in the distant RNG runs (two-tailed, as no prediction was made for the distant RNGs). The difference between the combined workshop (terminal z = 1.21) and distant data (terminal z = -1.04) was slightly positive (terminal z = 1.59).

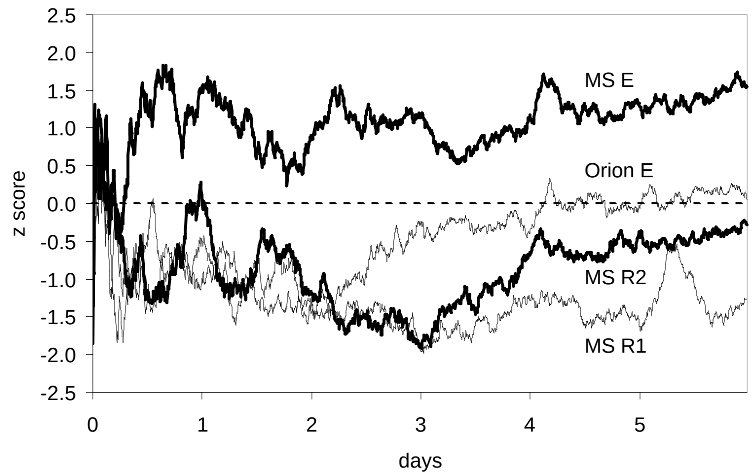

Figure 1. Cumulative empirical *z* (in this case *z* is a measure of variance) in the workshop or experimental condition for seven six-day runs with the Mindsong RNG (labeled MS E), five with the Orion RNG (labeled Orion E), five with a Mindsong RNG at distant location 1 (labeled MS R1), and seven with Mindsong RNG at distant location 2 (labeled MS R2).

The same analyses based on all available samples were more interesting (Figures 2, 3, 4). Three of the 12 workshop runs were independently significant, overall the 7 Mindsong RNG workshop curves combined were quite significant (terminal z = 3.27, p = 0.0005, one-tailed), and 7 of the 12 distant RNG curves were significant two-tailed (combined terminal z = -6.47, p= 9.6×10^{-11}, two-tailed). The difference between the combined workshop vs. combined distant results was highly significant (terminal z = 6.89, p= 5.6×10^{-12}, two-tailed).

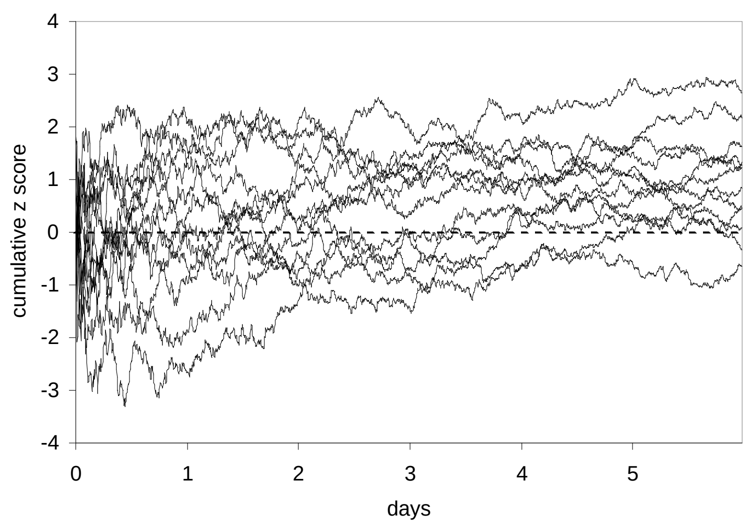

Figure 2. Empirical cumulative *z* scores (normalized meaures of shift in variance compare to calibration levels) with all available samples for each RNG run in the workshop.

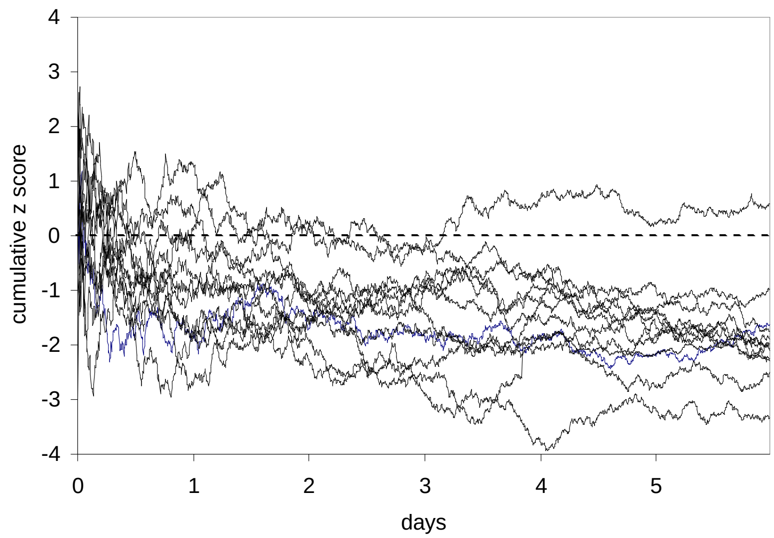

Figure 3. Empirical cumulative *z* scores with all available samples for each RNG run in the distant locations.

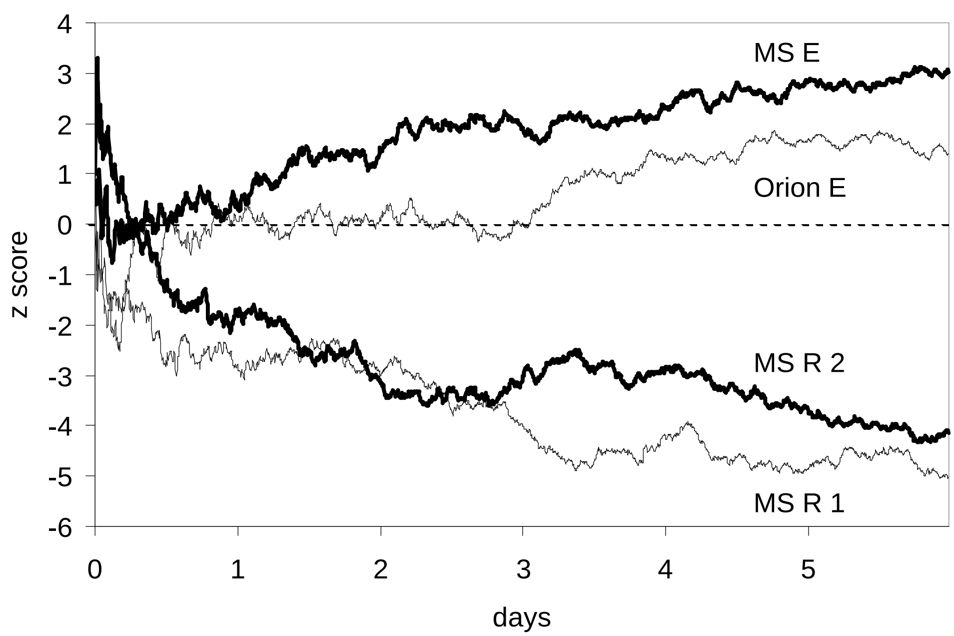

Figure 4. Empirical cumulative *z* scores based on all available samples, combining curves for the workshop RNGs (MS E and Orion E) and the two distant RNG runs (MS R 1 and 2).

Figure 5 shows that 10 of 12 runs in the experimental condition resulted in an overall sample standard deviation larger than that observed in the associated calibration condition, and 11 of 12 runs in the distant RNGs resulted in smaller standard deviations. As indicated by the trends shown in Figures 2 and 3, the cumulative results were apparently due to repeatable effects.

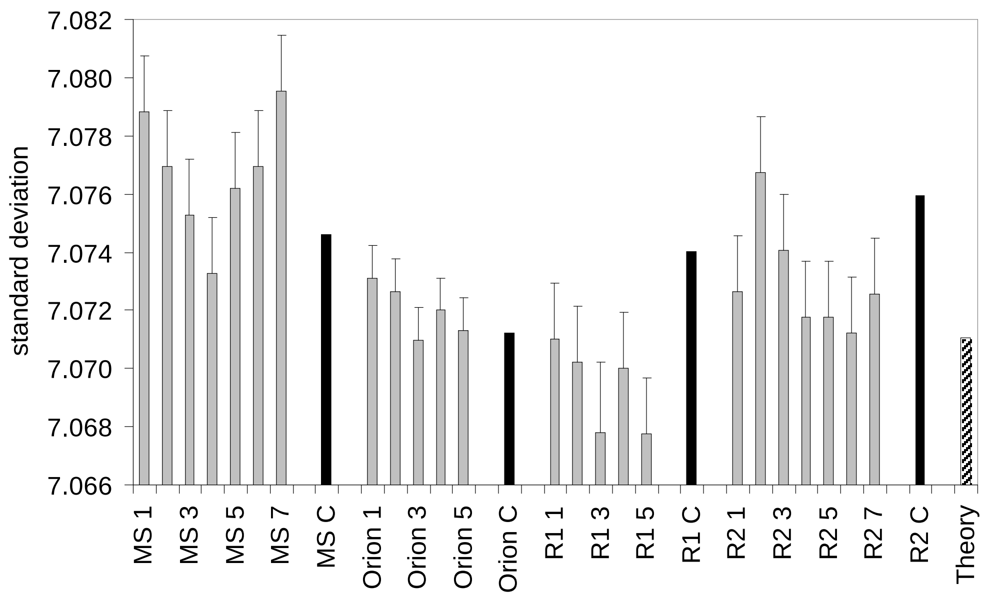

Figure 5. Overall standard deviations (and standard error bars) for all available samples generated by the RNGs during the workshops (Mindsong RNG = MS 1-7, Orion RNG = Orion 1-5, remote location 1 = R1 1-5 and remote location 2 = R2 1-7), during no workshops (Mindsong calibration = MS C, remote location 1 calibration = R 1 C, and remote calibration 2 = R 2 C), and theoretical expectation.

DISCUSSION

The one sample per second analysis produced nonsignificant results in the predicted direction, but analysis based on all samples supported the predicted MMI effect (z = 3.27, p = 0.0005). Differences between the workshop and distant RNG data were not predicted in advance, but the observed result with all available samples seems to rule out a coincidental relationship (z = 6.89, p = 5.6×10^{-12}). Similar equilibrium or balancing tendencies have been reported in a few previous MMI experiments (Jahn, Nelson & Dunne, 1985; Radin, 1993; Pallikari-Viras, 1997), but so far no firm conclusions have been drawn about these curious differential effects.

Environmental influences

One might propose that the present results were due to the fact that at the workshops the RNGs behaved differently due to the presence of human bodies, or to increased variations in local electrical power as compared to calibration periods when the environment was comparatively quiet. This proposal requires that RNG outputs be sensitive to parameters such as electromagnetic and electrostatic fields, temperature, power fluctuations, and physical vibration.

Such a proposal is implausible because these RNGs are housed in grounded metal boxes which significantly reduce external electromagnetic influences, the devices are designed to resist changes in electrostatic fields, temperature, power fluctuations, and physical vibration, and they draw power from the computer's regulated power supply to preclude glitches due to power line fluctuations. The RNGs were concealed in a centrally located meeting room in the building where the workshops took place, so even if participants wished to physically influence the RNG in some way, this could not happen because they did not know where it was located, nor did the workshop leaders mention the existence of the RNGs. The distant RNGs were always completely isolated from people in both the experimental and calibration conditions.

Of greater importance, these RNGs devices also employ logical exclusive-or (XOR) filtering on the "raw" binary outputs to ensure that first-order biases are eliminated, i.e., that the long-term probability of a 1 is the same as a 0. The XOR also guarantees that even if the RNG catastrophically failed, and it started to produce only sequences of say, 0s, the resulting mean of the generated bits would not drop to 0 but would remain at 0.5. (Momentary or partial device failures would be easily detected because the sample variance would quickly and substantially decline.)

In other words, the combination of physical shielding and logical design makes it most unlikely that mundane environmental factors could have produced the observed results. In future studies, to help investigate the source of the observed deviations in more detail, multiple RNGs with fundamentally different sources of randomness could be employed.

Experimenter effects

Another potential explanation is that these results are not due to a field consciousness effect, but instead to the experimenters' intentions. This possibility arises because previous "retro-PK" experiments have shown that later observation of previously recorded random bits can result in significant deviations from expectation, suggesting that real-time observation is not necessary (Bierman, 1998). This retro-PK effect, analogous to Wheeler's delayed-choice experiment in quantum mechanics (Wheeler, 1978), was predicted based on an quantum observational theory of mind-matter interaction (Houtkooper, 2002). Its import here is that none of the recorded random bits were observed until the first author analyzed the results. This means the entire experiment could be interpreted as a retro-PK experiment. To overcome this explanation in future studies one might ask analysts with different expectations to examine the data first, or to split the data into even and odd samples and give half the data to an analyst with a positive expectation and the remainder to an analyst with a negative expectation, or to employ neutral analysts who were blind to the purpose of the study.

Limitations

One limitation in this study is that each of the two distant RNG calibrations were run for only a single six-day period, so their means and standard deviations were not as accurate as the corresponding calibration values for the two workshop RNGs. Given the relatively large statistical power afforded by this study, tiny differences in accuracy may compound into large statistical effects. This limitation is somewhat ameliorated by the observation that the standard deviations of the distant calibrations, each based on about 6.8 million 200-bit samples, were similar to the standard deviation obtained in the workshop Mindsong RNG, based on 33.8 million 200-bit samples (as shown in Figure 5). Thus it is likely that the calibration behavior of these RNGs were sufficiently stable after a few million samples to make it unnecessary to collect additional samples. Future experiments might consider alternating workshop and calibration runs to ensure that the same amount of data are collected in both conditions.

Another limitation was the use of a single RNG at each site. This prevents drawing conclusions about the hypothetical field-like nature of the effect. Future studies could employ multiple RNGs in the workshop location, and at various distant locations, to help map out the nature of the postulated field. In addition, RNGs with different physical noise sources could be stationed at the same locations to test whether the apparent ordering effect is a general principal, detectable in all random sources, or whether only certain kinds of randomness are affected.

Robert A. Monroe, founder of The Monroe Institute, once wrote that "Focused consciousness contains all solutions to the questions of human existence." The present research effort did not attempt to obtain solutions to all questions, but it did raise the possibility that cultivating focused consciousness through entrained group coherence may be a useful technique for generating more robust MMI effects.

References

Atwater, F. H. (1997). Accessing anomalous states of consciousness with a binaural beat technology. *Journal of Scientific Exploration*, 11, 263-274.

Atwater, F. H. (2001). Binaural beats and the regulation of arousal levels. *Proceedings of the IANS 11th Forum on New Arts and Science*, International Association on New Science, 1612 Windsor Court, Fort Collins, CO 80526

Bierman, D.J. (1998). Do psi phenomena suggest radical dualism? In: Stuart R. Hameroff, Alref W. Kaszniak, and Alwyn C. Scott (Eds), *Toward a science of Consciousness II*, The MIT Press, Cambridge MA, pp. 709-714.

Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York: Harper & Row.

Csikszentmihalyi, M. (1997). *Creativity: Flow and the psychology of discovery and invention*. New York: HarperPerennial.

Guilford, J. P. & Fruchter, B. (1973). *Fundamental statistics in psychology and education* (Fifth edition). New York: McGraw Hill.

Houtkooper, J. M. (2002). Arguing for an observational theory of paranormal phenomena. *Journal of Scientific Exploration*, 16 (2), 171–185.

Jahn, R. G., Nelson, R. D. & Dunne, B. J. (1985). Variance effects in REG score distributions. PEAR Technical Note 85001, Princeton University, Princeton, NJ.

Kuwada, S., Yin, T.C. & Wickesberg, R.E. (1979). Response of cat inferior colliculus neurons to binaural beat stimuli: possible mechanisms for sound localization. *Science*, 206, 586-588.

Lane, J. D., Kasian, S. J., Owens, J. E. & Marsh, G. R. (1998). Binaural auditory beats affect vigilance performance and mood, *Physiology & Behaviour*, 63, 249-252.

Nelson, R. D., Bradish, G. J., Dobyns, Y. H., Dunne, B. J., and Jahn, R. G. (1996). FieldREG anomalies in group situations. *Journal of Scientific Exploration*, 10, 1, 111-142.

Nelson, R. D., Jahn, R. G., Dunne, B. J., Dobyns, Y. H., & Bradish, G. J. (1998). FieldREG II: Consciousness field effects: Replications and explorations. *Journal of Scientific Exploration*, 12, 425–454.

Oster, G. (1973). Auditory beats in the brain. *Scientific American*, 229, 94-102.

Pallikari-Viras, F. (1997) Further evidence for a statistical balancing in probabilistic systems influenced by the anomalous effect of conscious intention. *Journal of the Society for Psychical Research*, 62, 114-137.

Radin, D. I. (1993). Environmental modulation and statistical equilibrium in mind-matter interaction. *Subtle Energies and Energy Medicine*, 4, 1-30.

Wheeler, J. A. (1978). *The Mathematical Foundations of Quantum Mechanics*, In A. R. Marlow (Ed.) New York: Academic Press.

Field Consciousness Bibliography

Bierman, D. J. (1996). Exploring correlations between local emotional and global emotional events and the behavior of a random number generator. *Journal of Scientific Exploration*, 10, 363-373.

Blasband, R. A. (2000). The ordering of random events by emotional expression. *Journal of Scientific Exploration*, 14, 195–216.

Crawford, C. C., Jonas, W. B., Nelson, R., Wirkus, M. & Wirkus, M. (2003). Alterations in random event measures associated with a healing practice. *Journal of Alternative and Complementary Medicine*, 9 (3), 345-353.

Hagel, J. & Tschapke, M. (2004). The local event detector (LED): An experimental setup for an exploratory study of correlations between collective emotional events and random number sequences, *Proceedings of Presented Papers*, Parapsychological Association 2004.

Hirukawa, T. & Ishikawa, M. (2004). Anomalous fluctuation of RNG data in Nebuta: Summer festival in Northeast Japan. *Proceedings of Presented Papers*, Parapsychological Association 2004.

Kokubo, H., Yoichi, H. & Yamamoto, M. (2002). Data analyses of a field number generator. *The Japanese Journal of Parapsychology*, 7, 11-16. (In Japanese).

Nelson, R., Boesch, H., Boller, E., Dobyns, Y., Houtkooper, J., Lettieri, A., Radin, D., Russek, L., Schwartz, G. & Wesch, J. (1998). Global resonance of consciousness: Princess Diana and Mother Teresa. *The Electronic Journal of Parapsychology*. Abstract available on http://noosphere.princeton.edu as of January 2005.

Nelson, R.D., Radin, D. I., Shoup, R., Bancel, P. (2002). Correlation of continuous random data with major world events. *Foundations of Physics Letters*, 15 (6), 537-550.

Radin, D. I. (1997). *The conscious universe*. San Francisco: HarperEdge.

Radin, D. I. (2006). *Entangled minds*. New York: Simon & Schuster.

Radin, D. I. (2002). Exploring relationships between random physical events and mass human attention: Asking for whom the bell tolls. *Journal of Scientific Exploration*, 16 (4), 533-548.

Radin, D. I., Rebman, J. M., & Cross, M. P. (1996). Anomalous organization of random events by group consciousness: Two exploratory experiments. *Journal of Scientific Exploration*, 10, 143– 168.

Rowe, W. D. (1998). Physical measurements of episodes of focused group energy. *Journal of Scientific Exploration*, 12, 569-583.

Schwartz, G. E. R., Russek, L. G. S., Zhen-Su, S., Song, L. Z. Y. X., & Xin, Y. (1997). Anomalous organization of random events during an international quigong meeting: Evidence for group consciousness or accumulated qi fields? *Subtle Energies & Energy Medicine*, 8, 55–65.

Yoichi, H., Kokubo, H. & Yamamoto, M. (2002). Anomaly of random number generator outputs: Cumulative deviation at a meeting and New Year's holiday. *Journal of International Society of Life Information Science*, 20 (1), 195-201.

Yoichi, H., Kokubo, H. & Yamamoto, M. (2004). Anomaly of random number generator outputs (II): Cumulative deviation at New Year's holiday. *Journal of International Society of Life Information Science*, 22 (1), 142-146.

APPENDIX

Detailed results of RNG runs. In this table "all" refers to analysis of all available samples, "first" to analysis of the first sample per second. R1 refers to remote RNG about 0.1 mile from the workshops, and R2 to the remote RNG about a mile away. MS = Mindsong RNG, Orion = Orion RNG; *z* refers to a measure of normalized variance.

RNG	z (all)	z (first)	bits (billions)	samples (all)	samples (first)	mean (all)	sd (all)	mean (first)	sd (first)
MS 1	2.21	-0.53	1.37	6,846,608	520,500	100.0028	7.0788	100.0001	7.0736
MS 2	1.24	1.20	1.37	6,846,261	520,498	99.9994	7.0770	99.9988	7.0855
MS 3	0.35	-0.17	1.36	6,811,949	520,500	100.0050	7.0753	100.0118	7.0754
MS 4	-0.68	1.13	1.36	6,792,665	519,000	100.0018	7.0733	99.9920	7.0857
MS 5	0.84	0.03	1.37	6,846,615	520,499	99.9969	7.0762	99.9971	7.0771
MS 6	1.23	0.72	1.37	6,834,677	519,599	99.9987	7.0770	99.9933	7.0822
MS 7	2.58	1.73	1.37	6,846,350	520,499	100.0026	7.0795	99.9975	7.0889
MS Calibrate			6.77	33,859,784	2,573,699	100.0004	7.0746	99.9936	7.0773
Orion 1	1.69	2.03	4.03	20,136,453	528,900	100.0012	7.0731	99.9976	7.0876
Orion 2	1.28	0.35	3.94	19,680,192	516,899	100.0021	7.0726	99.9952	7.0767
Orion 3	-0.21	-0.67	3.95	19,759,933	519,000	99.9991	7.0710	99.9938	7.0698
Orion 4	0.71	-1.14	3.99	19,965,604	524,398	100.0010	7.0720	100.0084	7.0664
Orion 5	0.09	-0.46	3.94	19,680,085	516,900	100.0015	7.0713	100.0129	7.0710
Orion Calibrate			11.87	59,327,176	1,558,199	100.0006	7.0712	100.0036	7.0743
R1 1	-1.57	-0.84	1.35	6,770,631	519,600	100.0017	7.0710	100.0195	7.0665
R1 2	-2.00	-0.96	1.37	6,863,783	526,795	100.0034	7.0702	100.0105	7.0657
R1 3	-2.59	-0.67	0.87	4,327,524	332,098	99.9983	7.0678	100.0092	7.0665
R1 4	-2.10	-0.28	1.36	6,789,909	521,098	100.0007	7.0700	100.0074	7.0704
R1 5	-3.28	-0.35	1.37	6,833,274	524,397	100.0070	7.0678	99.9995	7.0699
R1 Calibrate			1.36	6,813,706	522,899	100.0009	7.0740	100.0118	7.0723
R2 1	-1.73	-0.44	1.37	6,847,046	523,200	100.0013	7.0726	100.0027	7.0734
R2 2	0.42	-0.40	1.38	6,921,391	528,898	100.0023	7.0767	99.9955	7.0737
R2 3	-0.98	-0.77	1.36	6,803,287	522,297	99.9989	7.0741	99.9958	7.0711
R2 4	-2.19	0.24	1.36	6,775,100	520,200	99.9988	7.0717	100.0101	7.0781
R2 5	-2.18	-1.74	1.37	6,866,506	524,700	100.0033	7.0718	99.9822	7.0644
R2 6	-2.46	0.43	1.36	6,819,517	521,099	100.0020	7.0712	100.0118	7.0794
R2 7	-1.77	1.44	1.37	6,839,355	522,600	100.0026	7.0726	99.9999	7.0864
R2 Calibrate			1.37	6,843,243	522,900	99.9960	7.0760	99.9953	7.0764

PRESENTIMENT IN THE BRAIN

Dean Radin[1] & Eva Lobach[2]

[1] *Institute of Noetic Sciences*
Petaluma, CA, USA

[2] *University of Amsterdam,*
The Netherlands

ABSTRACT

Slow cortical potentials in human subjects were measured to test a possible transtemporal component of expectation. One channel of EEG was recorded over the occipital lobe while a participant was exposed to a truly random sequence of dichotomous stimuli: a flash of light or no flash. Successive stimuli were determined randomly four seconds after the participant pressed a button. Data were collected in sessions of 100 trials, contributed by 13 female and 7 male participants. Females' slow cortical potentials differentiated significantly one second before stimulus onset (z= 2.72, p= 0.007, two-tailed). For males, there was a suggestive effect in the opposite direction (z= -1.64, p= 0.10, two-tailed). Examination of alternative explanations indicated that these effects were not due to anticipatory strategies or artifacts associated with equipment, procedures or analytical methods. The experiment suggests that comprehensive models of expectation effects, including the placebo response, may require a transtemporal component.

INTRODUCTION

Norman Cousins summarized decades of research on mind-body medicine with the pithy phrase, "belief becomes biology" (Cousins, 1989). What is the mechanism underlying this process? The conventional answer is that beliefs, and more generally conscious and unconscious expectations, become biology through complex interactions between biochemistry and the nervous system (Oakley, 2004). The underlying process is assumed to be analogous to a causal, clockwork mechanism that, in effect, pushes the organism towards a desired goal (Brunia & van Boxtel, 2001). But what if anticipation also involves sensing future events? Then the goal-oriented nature of the placebo effect might be understood not only in terms of efficient cause in the Aristotelian sense, but also as a form of final cause, or as a teleological pull from our own future. That is, if we were able to sense potential future courses of an illness and "select" a favorable future path, then we may be able to intelligently navigate through those potential futures to achieve a desired outcome (Braud, 2000).

The orthodox view is that anticipation may have a teleological patina, but "in fact our view from the future is based upon our past experiences" (Brunia, 1999), and past experiences alone. This assumption is taken as self-evident because the idea of the future influencing the present leads to a causal paradox – the classic example is a grandson preventing the birth of his own grandfather. Such paradoxes cannot occur in a universe with just one course of history, such as the world of everyday experience. One way to avoid the paradox is to postulate the existence of parallel universes, which is a respectable idea in theoretical physics (Tegmark, 2003). Another is to regard "the future" as a probabilistic state that *might* occur rather than a predetermined outcome that *must* occur. Theoretical debates over such issues, which is deeply entangled with the problem of free will vs. determinism, have continued unabated for thousands of years without resolution. However, the question whether the future influences the present can also be addressed without resort to philosophical debate – it can be tested empirically.

Two classes of laboratory experiments have been conducted to look for what we call presentiments of future events: The first class involves *consciously* guessing the outcomes of randomly generated future stimuli; the second involves monitoring *unconscious* physiological responses to future stimuli. Most tests involving conscious reports have been based upon a forced-choice design, in which a person is asked to pick which one of say, four lamps, will be selected by a truly random process after the person's choice. Meta-analysis of 309 forced-choice experiments published from 1935 to 1987 provides evidence that such conscious presentiments are possible (Honorton & Ferrari, 1989).

Two types of experiments involving unconscious measures have been developed more recently. In the first, event related potentials (ERP) in the brain are monitored while viewing visual targets, one of which will be selected randomly in the future. In a series of such experiments initiated by Warren, McDonough and Don (1992), ERPs before correct selection of future targets were found to significantly differ from ERPs before incorrect selections (Warren, McDonough & Don, 1992; Don, McDonough & Warren, 1998; McDonough, Don & Warren, 2002).

In the second type of experiment, physiological factors before dichotomous stimuli are monitored to see whether the nervous system unconsciously anticipates upcoming, randomly selected future events. Measures in these experiments have included skin conductance level (Bierman & Radin, 1997, 1998; Radin, 1997, 2004; Parkhomtchouk, Kotake, Zhang, Chen, Kokubo & Yamamoto, 2002; McCraty, Atkinson & Bradley, 2004a, b; Wildey, 2001), non-specific skin conductance response (Spottiswoode & May, 2003; May, Paulinyi & Vassy, 2005), heart rate (McCraty et al., 2004a,b), ERPs (McCraty et al., 2004a,b), brain electrical activity (Levin & Kennedy, 1975; Hartwell, 1978a,b), and blood oxygenation levels in the brain measured with functional magnetic resonance imaging (Bierman & Scholte, 2002). Stimuli in these studies have included emotional vs. calm pictures, stylized happy vs. sad faces, and audio startle tones vs. silence. In some of these studies participants initiated trials of fixed lengths at will, in others stimuli appeared spontaneously at random times. The majority of these experiments have reported positive evidence for presentiment, many significantly positive.[1]

The present experiment was anticipated in 1946 and described 15 years later by the British statistician I. J. Good as follows:

> A man is placed in a dark room, in which a light is flashed at random moments of time…. The man's EEG (electroencephalogram) is recorded on one track of a magnetic tape, and the flashes of light on another. The tape is then analyzed statistically to see if the EEG shows any tendency to forecast the flashes of light (Good, 1961, p. 58).

Good's idea is intriguing because slow cortical potentials (SCP) in the brain have been used to study anticipation since the 1960s, when the first SCP, dubbed contingent negative variation (CNV), was reported by Grey Walter and his colleagues (Walter, Cooper, Aldridge, McCallum & Winter, 1964). It is not generally known that Walter later explicitly recommended that SCPs might be especially useful in studying presentiment effects (Walter, 1970).

Shortly after Walter described the CNV, another SCP was identified and called the *Bereitschaftspotential* or "readiness potential," which is associated with the anticipation of motor movement (Deecke, 1987). Later the CNV was observed to have different early and late components, and more recently another SCP referred to as "stimulus-preceding negativity" has become a focus of study. Based on these lines of research, anticipation is now considered "a state that is characterized by the activation of the brain areas required for the specific upcoming cognitive operations. For instance, anticipation of perceptual input may activate posterior brain areas, anticipation of affective input right frontal areas, and so on" (van Boxtel & Böcker, 2004). This specificity, combined with Good's idea and previous studies, suggested a simple method to explore the temporal processes underlying anticipatory attention.

[1] Selective reporting biases in this domain are probably minimal, as the experimental paradigm is relatively new, the number of people conducting these types of studies are limited, and researchers are aware of each others' efforts.

METHOD

The concept of presentiment predicts that SCPs will behave differently before a light flash than before a no-flash control. Based on McCraty et al's (2004b) results, this differential effect was predicted to become most evident about one second before the stimulus. And because the anticipated stimulus in our design was a light flash, the principal SCP changes were expected to occur in the visual cortex. To provide a design that avoided multivariate complications, a single EEG measurement was taken over the occipital lobe at O_z according to the international 10-20 standard (Jasper, 1958).

Procedure

Each participant was prepped with three Ag/AgCL electrodes (Biopac Model EL258S, Biopac Systems, Goleta, CA; Omni Prep skin preparation solution and Ten20 Conductive Paste, D. O. Weaver and Co., Aurora, CO).[2] Electrodes were placed at Oz and both earlobes; the left earlobe was used as ground and the right as reference. All connections were tested to achieve minimal impedance (Checktrode® Model 1089e, UFI, Morro Bay, CA), and then connected to a Biopac EEG-100C amplifier (16 bit resolution, 20,000 gain, 0.1-35 Hz bandpass, Biopac M-150 system). Digitized EEG data were recorded continuously throughout each experimental session at 250 Hz and saved to hard disk.

The participant relaxed in a comfortable chair and wore a pair of visual stimulator glasses (Model VSW-3, A/V Stim, San Rafael, CA). Three bright white LEDs were mounted in these glasses in front of each eye, with one LED positioned laterally towards the outside of the eye, and one above and one below, for a total of six LEDs. The stimulator was connected to an analog to digital circuit (Ontrak Control Systems, Sudbury, Ontario, Canada, Model ADR-100) which was in turn connected to a Windows-based computer through a serial port. This allowed the stimulator to be controlled by the computer. The controlling program was written in Microsoft Visual Basic 6 by the first author.

The participant was asked to hold a computer mouse in his or her dominant hand and press the left button at will. The button press started a timer that waited four seconds, then a truly random number generator (RNG; Orion, The Netherlands) was queried by the computer to decide whether to flash the six LEDs for 250 msec or to remain dark, with p(flash) = p(no-flash) = 0.5 (see Figure 1). After the flash or no-flash event, the timer waited another 4 seconds and then the computer sounded a short click tone to signal the end of the epoch. The participant could then begin the next trial at will. Each recording session consisted of 100 trials. Note that during the 4 second period preceding stimulus onset, the stimulus was not yet determined, thus the protocol was rigorously double-blind. That is, the future stimulus was not simply unknown by participant and investigator, but under the null hypothesis, *unknowable*.

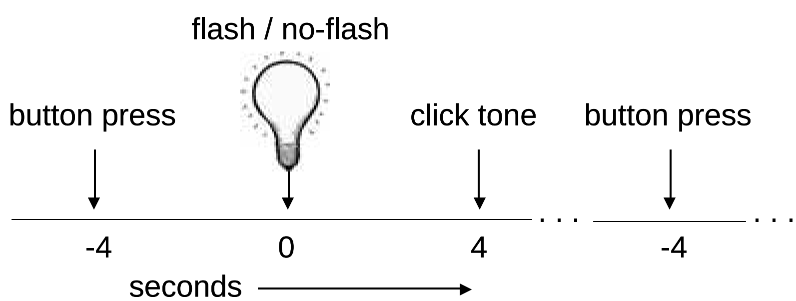

Figure 1. Experimental design. A computer sampled a truly random number generator circuit immediately before the stimulus to decide whether to flash or not flash the lamp.

After checking that EEG data were being properly collected, that the visual stimulator was operating as expected, and that the RNG passed a rudimentary randomness test for uniform distribution of flash/no-

[2] Two sessions were conducted using gold electrodes, which may have affected the SCP signals.

flash conditions, the experimenter placed a flexible, opaque shield around the participant's head to block distractions from ambient lights and movements (Figure 2). Each participant was asked to keep his or her eyes closed throughout the session to reduce eye blink and movement artifacts, and to remain as still as possible during each 8.25-second trial.

Figure 2. Participant in experiment.

Analysis

All analyses were conducted using custom-designed Matlab 7 (The Mathworks, Inc., Natick, MA, USA) programs. The following nine steps were employed:

1) To reduce high frequency noise, each test session's EEG record was smoothed using a low-pass filter consisting of a sliding average window 3 samples in length, i.e. each smoothed sample s_i consisted of the average of original samples o_{i-2}, o_{i-1} and o_i. At 4 msec per original sample, this provided a sliding average of 12 msec.
2) Epochs ±1 second from stimulus onset in each smoothed EEG record were extracted. If the absolute value of any sample during the pre-stimulus period exceeded ±75 μV, that epoch was considered to contain a potential movement artifact and was eliminated from further analysis. Selection of this threshold value was based on previous studies investigating SCPs (Trillenberga, Verlegera, Wascherc, Wauschkuhna & Wessela, 2000).
3) Each epoch passing the artifact threshold in Step 2 was baseline adjusted by taking the difference between smoothed sample 1 (i.e., 1 second pre-stimulus onset) and the remaining 499 samples in each 2-second epoch.
4) The ensemble median was calculated for all flash epochs across all sessions (by gender), and a similar ensemble median curve calculated for all no-flash epochs. Median was employed rather than the mean to provide a nonparametric curve less sensitive to potential outliers.
5) The summed difference between the flash and no-flash curves determined in Step 4 was calculated for the 1-second period pre-stimulus onset. Call this value sum_{pre}.
6) The original assignment of flash and no-flash conditions was randomly permuted (Blair & Karniski, 1993).
7) Steps 4 – 6 were repeated 10,000 times, building up a distribution of randomly permuted sum_{pre} values. Call these values $sum_{pre\text{-}r}$.
8) The mean (μ) and standard deviation (σ) of the distribution of $sum_{pre\text{-}r}$ were calculated, and then $z_{pre} = (sum_{pre} - \mu)/\sigma$ was determined. This z score is a normalized measure of pre-stimulus response.
9) The presentiment concept predicts that z_{pre} would significantly differ from chance expectation, thus a two-tailed test was employed.

A secondary analysis examined the difference between the maximum deviation of the pre-stimulus median curve prior to a flash vs. the minimum deviation prior to a no-flash. A similar permutation method as in steps 7 and 8 was used to create a normalized max-min score, z_{mm}.

Procedural control

To check whether hardware, software, analytical procedures, or the electromagnetic pulse produced by the stimulator glasses might have inadvertently introduced systematic artifacts in favor of the presentiment hypothesis, after the experimental data were collected a second set of 1,000 pre-planned epochs were collected using a "sham brain" (a grapefruit). The same EEG electrodes and visual stimulator glasses were affixed to the sham brain analogously to how they were attached to a human head, and 10 sessions of 100 trials each were run using the same procedures employed in the experiment, with one addition: Instead of a human pressing the button to initiate each epoch, a timer was used to generate a random inter-trial latency, and then the controlling program automatically started each trial.

There was no attempt to study the electrical properties of the sham brain, as none were expected in a grapefruit. Instead, this procedure examined whether anything *other* than electrical signals might have produced artifacts that could mimic a presentiment effect.

RESULTS

A total of 20 sessions of 100 trials each were collected. Participants included 13 females (ages 18 to 55) and 7 males (ages 48 to 65). Because of known gender differences in how the brain processes visual information (e.g., Mitchell, Howe & Spencer, 1987; Voyer, Voyer & Bryden, 1995; Kaufmann, Elbel, Gössl, Pütz & Auer, 2001), data were evaluated separately for male and female participants. Of the 2,000 trials, 1,925 passed the 75 µV artifact rejection criterion, thus 96% of the data were used in the subsequent analysis. (After the second session the EEG amplifier gain was adjusted and in the last 18 sessions 98.9% of the data were usable.) Among all 2,000 trials, 1,015 were randomly assigned to the no-flash condition and 985 to the flash condition. The stimulus conditions were distributed in accordance with chance expectation (z=-0.69 for proportion of flash conditions), as were autocorrelations of the sequence of flash vs. no-flash conditions, calculated through lag ±50.

For females, the presentiment hypothesis was supported with z_{pre}=2.72, p= 0.007 (all p-values are two-tailed), and z_{mm} = 3.45, p= 0.0006. For males, the same analysis was weakly negative, z_{pre} = -1.64, p= 0.10, and z_{mm} = -1.36, p= 0.18. The gender difference between z_{pre} outcomes was significant, z = 3.08, p = 0.002, as was the difference for $z_{mm,}$ z = 3.40, p= 0.0007. Figure 3 shows the median curves for all 13 females for ±1 second around the stimulus onset; Figure 4 shows the same curves ±5 seconds to show the results in context (with 200 msec smoothing for the sake of clarity). Figure 5 shows the same analysis for the 7 males. The control test with a sham brain resulted in a nonsignificant difference, z_{pre} = -1.34 (p= 0.18, with 490 no-flash and 510 flash trials).

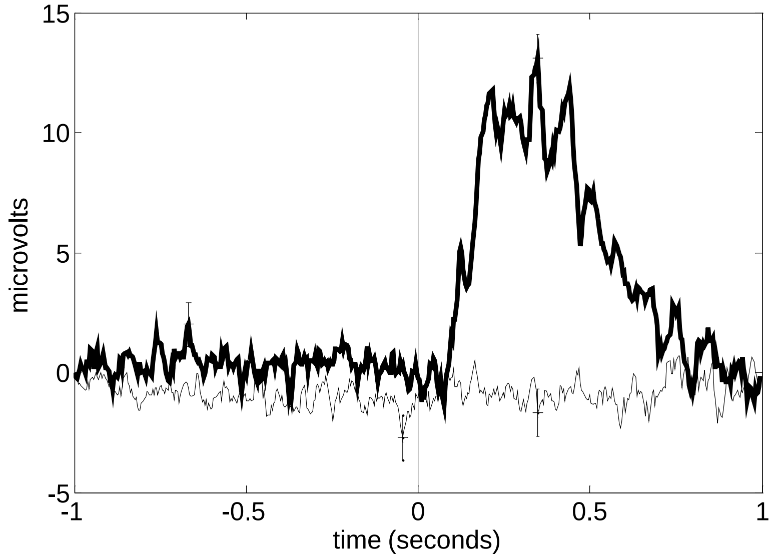

Figure 3. Median EEG signals at O_z for the 13 female participants combined, with baseline subtracted one second pre-stimulus (stimulus shown as time 0), and smoothed using a sliding average window of 12 msec. The bold line is the median during flash trials, the thin line is the no-flash control. Error bars are one standard error.

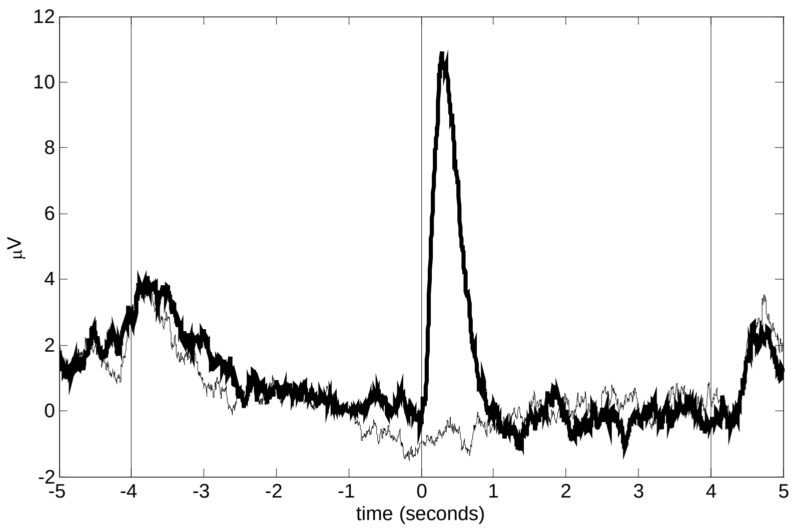

Figure 4. Median EEG signals for 13 female participants ±5 seconds from stimulus onset, with baseline subtracted 1 second pre-stimulus, and smoothed with a sliding average window of 200 msec. The bold line is the median prior to flash stimuli, the thin line is the no-flash control. These curves differ slightly from those in Figure 3 because of the longer smoothing window used to enhance the curve's clarity.

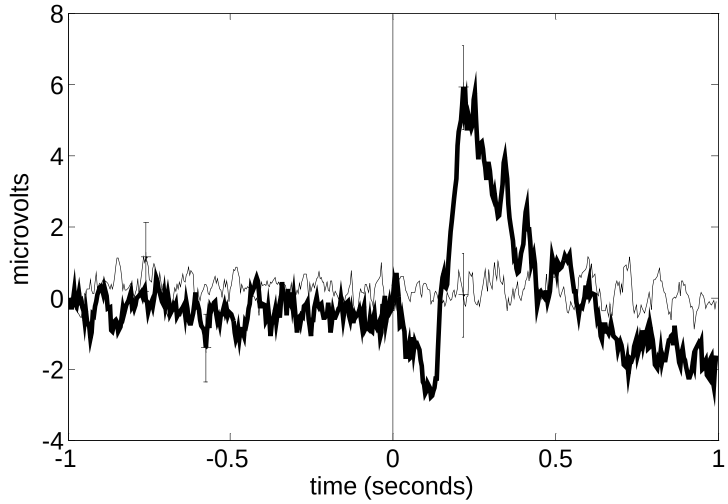

Figure 5. Median EEG signals for the 7 male sessions combined.

To study the difference in the flash vs. no-flash curves in a simpler fashion, for each trial we determined two directions (rise or fall) that the SCPs could change over the half-second period ranging between -1 to -0.5 seconds pre-stimulus by examining whether SCP at -0.5 seconds was positive or negative. Counts within the four possible categories, evaluated for females in a 2×2 contingency table, resulted in a chi-square = 7.25, $p = 0.007$ (see Figure 6). The same analysis for males resulted in a nonsignificant chi-square = 0.42, $p = 0.51$.

This indicates (for females) that in epochs when nothing happened (the no-flash condition) the majority of SCPs continued to follow a negative trend; this is consistent with a state of continued anticipation. By contrast, in epochs where the future contained a light flash, then the majority of SCPs showed a rising trend. The larger difference in trends observed in the no-flash condition is intriguing, but additional replications are required to judge whether this is a meaningful or spurious difference.

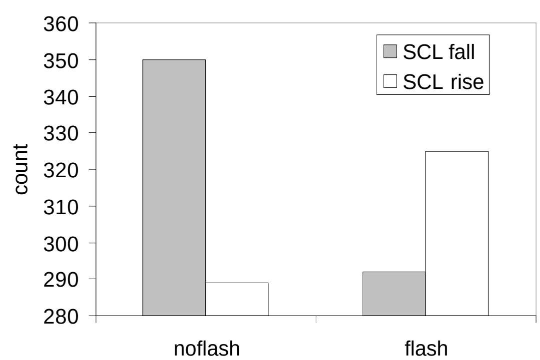

Figure 6. There were more trials with SCP falling when the epoch future condition was a no-flash, and more trials with SCP rising when the future condition was a flash ($p = 0.007$).

DISCUSSION

This experiment suggests that anticipation may involve perception of future events that cannot be inferred. Given the unconventional nature of this interpretation, it is useful to examine alternative explanations that might have produced a similar outcome. Many potential alternatives were rendered implausible by experimental design and controls; others could be evaluated analytically. The former include sensory and expectation cues about the future stimuli, procedural errors, and movement artifacts; the latter includes sensitivity of the results to various analytical parameters.

Sensory cues were not available because the decision to generate a flash or no-flash condition was made by a truly random process after the pre-stimulus period. *Expectation cues* were controlled because the random process selected the two conditions with equal probability (p= 0.5), and later analyses showed no biases in the sequence of stimulus conditions. Thus no statistical strategy could have been used to outguess the successive stimuli. *Procedural artifacts* including hardware, software and analytical errors were tested using the sham brain control, and no evidence was observed of systematic bias that might have produced the observed results.

Movement artifacts were moderated by asking participants to keep their eyes closed during the entire recording session and to remain as still as possible during each 8.25-second test epoch. Of course, even if there *were* movement artifacts in the EEG, to produce the observed results (in the female data) the movements would have had to occur differentially in accordance with the presentiment hypothesis. To explore whether the observed outcome might have been sensitive to the selected artifact rejection threshold of 75 µV, the analysis was repeated (on the female data) using artifact rejection thresholds ranging from 25 µV to 145 µV in steps of 10 µV. As shown in Figure 7, this analysis indicated that the statistical outcome was stable at z_{pre} ~ 2.5 for thresholds at or greater than 45 µV, or equivalently for 80% of the data or more.

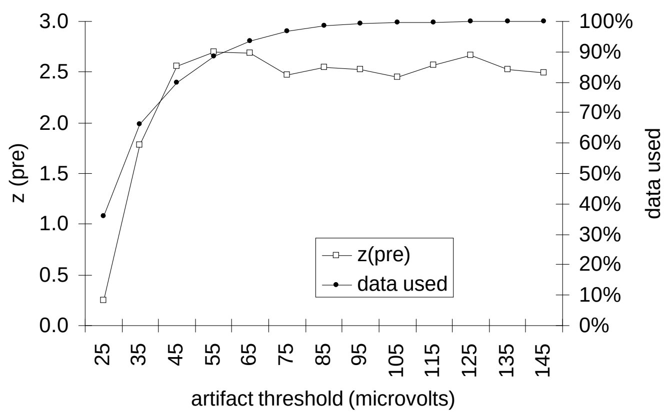

Figure 7. Statistical results and percentage of retained data across a range of artifact rejection thresholds.

Another free parameter in this analysis was the selection of the point within the prestimulus period in which to subtract the baseline. We selected one second because observations in previous presentiment experiments suggested that pre-stimulus responses might be time-symmetric with respect to stimulus onset. That is, if a post-stimulus response ends about N seconds after stimulus onset, then the presentiment effect might begin about N seconds *before* stimulus onset. To test the sensitivity of this timing parameter, we re-analyzed the female data by clamping the two curves from -4 seconds to -0.2 seconds before stimulus onset (in steps of 40 msec), and then recalculating z_{pre} for each of these pre-stimulus periods. As shown in Figure 8, this revealed that the optimal time to detect a presentiment effect was about -1.0 second pre-stimulus, but that the effect became increasingly apparent starting about -2 seconds pre-stimulus. This suggests that the effect was not highly dependant on timing.

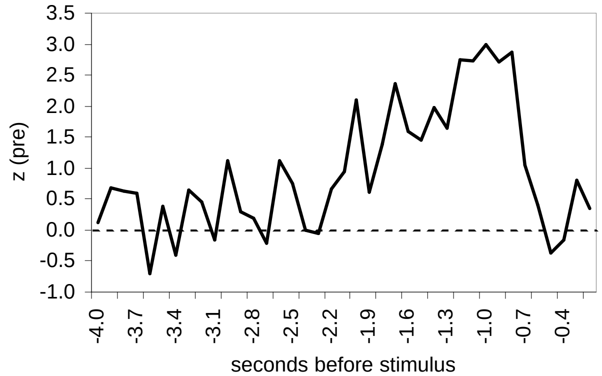

Figure 8. Results of z_{pre} score after clamping the median curves from 4 seconds to 200 msec pre-stimulus onset. This shows that the peak presentiment effect occurred about -1.4 to -0.8 seconds before the stimulus.

Could the results have been due to procedural or idiosyncratic differences between the two investigators? Among the female participants, the first author ran 6 sessions and obtained a Stouffer z= 1.12; the second author ran 7 sessions and obtained a Stouffer z = 2.35. The difference was not significant (z= 0.87, p= 0.19). The first author ran five males and obtained a Stouffer z = -1.47; the second author ran two males and obtained a z= -0.43. Again the difference was not significant (z= 0.74, p= 0.23). This suggests that the source of the effect was not due to variations in investigators.

Could the results have been due to one or two participants who produced unusually deviant outcomes? Table 1 shows that 10 of the 13 individual female sessions resulted in positive z_{pre} scores, and 6 of the 7 male sessions resulted in negative z_{pre} scores, thus the results were not due to a few deviant sessions.

TABLE 1:

RESULTS PER SESSION PER INVESTIGATOR, FOR Z_{PRE} AND Z_{POST}, NUMBER OF SAMPLES PER SESSION PASSING THE ARTIFACT CRITERION, AND THE PERCENTAGE OF STIMULI IN THE FLASH CONDITION. DR IS THE FIRST AUTHOR, EL THE SECOND.

Session	Gender	Investigator	Z(pre)	Z(post)	Samples	% flash
1	F	DR	0.72	3.01	100	48%
2	F	EL	1.18	2.14	100	52%
3	F	EL	2.64	4.67	99	47%
4	F	EL	-2.46	3.67	100	60%
5	F	EL	0.90	1.61	100	48%
6	F	EL	1.95	5.84	98	48%
7	F	EL	1.12	3.79	97	47%
8	F	EL	0.88	1.93	100	45%
9	F	DR	-1.50	0.89	100	50%
10	F	DR	1.15	4.91	94	48%
11	F	DR	-0.32	4.69	100	50%
12	F	DR	2.04	3.55	94	55%
13	F	DR	0.66	4.84	99	51%
1	M	EL	-0.13	1.32	46	52%
2	M	EL	-0.48	4.21	100	48%
3	M	DR	-0.85	0.09	100	43%
4	M	DR	-1.78	2.49	100	49%
5	M	DR	-0.29	-0.80	100	43%
6	M	DR	0.37	2.23	99	43%
7	M	DR	-0.74	1.05	100	57%

Interpretations

This study suggests that the human nervous system anticipates future events that cannot be sensed or inferred in conventional ways. There are two principal unconventional contenders for interpreting these outcomes. A perceptual, “passive” interpretation proposes that some aspect of the mind/brain is sensitive to events that are about to unfold (May, Paulinyi & Vassy, 2005). This interpretation requires that future events exist either in some form (determined or probabilistic), otherwise there would be nothing available to perceive in the present. An alternative, “active” interpretation, suggests that anticipation alters the probabilities of potential future events (Radin & Nelson, 2003).

In the present case, the results are more consistent with a passive interpretation because overall the number of flash and no-flash stimuli were in accordance with chance expectation. However, in Table 1 notice that in female session 4 the percentage of flash conditions was significantly above chance expectation, at 60% (z= 2), and that same session also resulted in the strongest negative z_{pre} = -2.46. This led us to examine the correlation between z_{pre} per session and the percentage of flash trials per session. The result was r = -0.54 (p= 0.06, two-tailed) for women, and r= -0.24 (p= 0.60, two-tailed) for men. This negative correlation, suggestive for women, offers a potential way to distinguish between passive and active interpretations of presentiment effects, namely that with the passive interpretation the distribution of stimulus conditions might be consistent with chance expectation and z_{pre} would be positive, and with active interpretations the opposite would occur.

While the concepts of retroaction and time-symmetry are taken seriously in physics (Aharonov, Bergmann & Lebowitz, 1964; Elitzur, 1990), the idea that transtemporal effects may also influence human health and behavior is rarely considered. The present study suggests that our understanding of how belief becomes biology, and perhaps also how expectation influences behavior in the classroom, the courtroom, in sports, and in the laboratory (Vergin & Sosika, 1999; Gandar, Zuber & Lamb, 2001; Rosenthal, 2002; Haw & Fisher, 2004; Jeng, 2005), may benefit by reconsidering Aristotle’s final cause.

Acknowledgments

We thank the volunteers who kindly participated in this study, and Richard and Connie Adams, Michael Breland, Claire Russell, and Mary Hanson for helping to fund our research program.

References

Aharonov, Y., Bergmann, P. G., Lebowitz, J. L. (1964). Time symmetry in the quantum process of measurement, Physical Review, 134, B1410–B1416.

Bierman, D. J. & Radin, D. I. (1997). Anomalous anticipatory response on randomized future conditions. *Perceptual and Motor Skills*, 84, 689-690

Bierman, D. J. & Radin, D. I. (1998). Conscious and anomalous non-conscious emotional processes: A reversal of the arrow of time? *Toward a Science of Consciousness, Tucson III*. MIT Press, 1999, 367-386

Bierman, D. J. & Scholte, H. S. (2002). Anomalous anticipatory brain activation preceding exposure of emotional and neutral pictures. Paper presented at Toward a Science of Consciousness, Tucson IV

Blair RC, Karniski W. (1993). An alternative method for significance testing of waveform difference potentials. *Psychophysiology*, 30, 518–524.

Braud, W. (2000). Wellness implications of retroactive influence: Exploring an outrageous hypothesis. *Alternative Therapies in Health and Medicine*. 6, 37-48.

Brunia, C.H.M. (1999). Neural aspects of anticipatory behavior. *Acta Psychologica*, 101, 213-242.

Brunia, C.H.M., van Boxtel, G.J.M. (2001). Wait and see. *International Journal of Psychophysiology, 43*, 59-75.

Cousins, N. (1989). Belief becomes biology. *Advances in Mind–Body Medicine, 6*, 20-29.

Deecke, L. (1987). Bereitschaftspotential as an indicator of movement preparation in supplementary motor area and motor cortex. In G. Bock (Ed.), Motor areas of the cerebral cortex : CIBA Symposium 132. London: Wiley.

Don NS, McDonough BE, Warren CA. (1998). Event-related brain potential (ERP) indicators of unconscious psi: A replication using subjects unselected for psi. *Journal of Parapsychology*, 62, 127–145.

Elitzur, A. C. (1990). On some neglected thermodynamic peculiarities of quantum non-locality, *Foundations of Physics Letters*, 3, 525 – 541.

Gandar, J. M., Zuber, R. A. & Lamb, R. P. (2001). The home field advantage revisited: a search for the bias in other sports betting markets, *Journal of Economics and Business*, *53*, 439–453.

Good, I. J. (1961). Letter to the editor. *Journal of Parapsychology*, 25, p. 58

Hartwell, J. W. (1978). Contingent negative variation as an index of precognitive information. *European Journal of Parapsychology*, 83-102.

Hartwell, J. W. (1978). An extension to the CNV study and an evaluation. *European Journal of Parapsychology*, xx-xxx.

Haw, R. M. & Fisher, R. P. (2004). Effects of administrator–witness contact on eyewitness identification accuracy. *Journal of Applied Psychology*, *89*, 1106–1112.

Honorton C, Ferrari DC. (1987). Future telling: a meta-analysis of forced-choice precognition experiments, 1935-1987. J Parapsychology. 53, 281-308.

Jasper, H. H. (1958). The ten-twenty electrode system of the International Federation, *Electroencephalography and Clinical Neurophysiology*, 10, 370-375.

Jeng, M. (2005). A selected history of expectation bias in physics. arXiv:physics/ 0508199 v1.

Kaufmann, C., Elbel, G-K, Gössl, C., Pütz, B. & Auer, D. P. (2001). Frequency dependence and gender effects in visual cortical regions involved in temporal frequency dependent pattern processing. *Human Brain Mapping*, 14, 28 – 38.

Levin, J. & Kennedy, J. (1975). The relationship of slow cortical potentials to psi information in man. *Journal of Parapsychology*, *39*, 25-26.

May, E. C., Paulinyi, T., & Vassy, Z. (2005). Anomalous anticipatory skin conductance response to acoustic stimuli: Experimental results and speculation about a mechanism. *Journal of Alternative and Complementary Medicine*, *11*, 695-702.

McCraty, R, Atkinson, M. & Bradley, R.T. (2004a). Electrophysiological evidence of intuition: Part 1. The Surprising role of the heart. *Journal of Alternative and Complementary Medicine, 10*, 133–143

McCraty, R, Atkinson, M. & Bradley, R.T. (2004b). Electrophysiological evidence of intuition: Part 2. A system-wide process? *Journal of Alternative and Complementary Medicine*, *10*, 325–336

McDonough, B. E., Don, N. S., & Warren, C. A. (2002). Differential event-related potentials to targets and decoys in a guessing task. *Journal of Scientific Exploration, 16*, 187-206.

Mitchell, K. W., Howe, J. W., & Spencer, S. R. (1987). Visual evoked potentials in the older population: age and gender effects. *Clinical Physics and Physiological Measurement*, 8, 317-324.

Oakley, R. (2004). How the mind hurts and heals the body. *American Psychologist, 59*, 29–40.

Parkhomtchouk, D. V., Kotake, J., Zhang, T, Chen, W, Kokubo, H, and Yamamoto, M. (2002). An attempt to reproduce the presentiment EDA response. *Journal of International Society of Life Information Science*, 20 (1), 190-194.

Radin, D. I. & Nelson, R. D. (2003). Meta-analysis of mind-matter interaction experiments: 1959 - 2000. In Jonas, W. & Crawford, C. (Eds.), *Healing, Intention and Energy Medicine*. London: Harcourt Health Sciences.

Radin, D. I. (1997). Unconscious perception of future emotions: An experiment in presentiment. *Journal of Scientific Exploration*, *11*, 163–180.

Radin, D. I. (2004). Electrodermal presentiments of future emotions. *Journal of Scientific Exploration. 18*, 253-274.

Rosenthal, R (2002). Covert communication in classrooms, clinics, courtrooms, and cubicles. *American Psychologist, 57*, 839-849.

Spottiswoode S. J. P. & May E. C. (2003). Skin conductance prestimulus response: Analyses, artifacts and a pilot study. *Journal of Scientific Exploration, 17,* 617–641.

Tegmark, M. (2003). Parallel universes. In eds. J.D. Barrow, P.C.W. Davies & C. Harper (Eds.), *Science and Ultimate Reality*, Cambridge University Press.

Trillenberga, P., Verlegera, R., Wascherc, E., Wauschkuhna, B. & Wessela, K. (2000). CNV and temporal uncertainty with "ageing" and "non-ageing" S1— S2 intervals. *Clinical Neurophysiology, 111*, 1216-1226.

van Boxtel, G. J. M. & Böcker, K. B. E. (2004). Cortical measures of anticipation. *Journal of Psychophysiology, 18,* 61–76.

Vergin, R. C. & Sosika, J. J. (1999). No place like home an examination of the home field advantage in gambling strategies in NFL football. *Journal of Economics and Business, 51*, 21–31.

Voyer, D., Voyer, S. & Bryden, M.P. (1995). Magnitude of sex differences in spatial abilities: a meta-analysis and consideration of critical variables. *Psychological Bulletin, 117,* 250–270.

Walter, W. G. (1970). The contingent negative variation and its significance for psi research. In Cavanna (Ed.), *Psi favorable states of consciousness*. Parapsychology Foundation.

Walter, W. G., Cooper, R., Aldridge, V. J., McCallum, W. C., & Winter, A. L. (1964). Contingent negative variation: An electric sign of sensorimotor association and expectancy in the human brain. *Nature, 203,* 380–384.

Warren, C. A., McDonough, B. W., & Don, N. S. (1992). Event-related brain potential changes in a psi task. *Journal of Parapsychology, 56,* 1-30.

Wildey, C. (2001). *Impulse response of biological systems*. Master's Thesis, Department of Electrical Engineering, University of Texas at Arlington.

EFFECTS OF MOTIVATED DISTANT INTENTION ON ELECTRODERMAL ACTIVITY

Dean Radin[1], Jerome Stone[2], Ellen Levine[3], Shahram Eskandarnejad[3], Marilyn Schlitz[1,3], Leila Kozak[4,5], Dorothy Mandel[5] & Gail Hayssen[1]

[1] *Institute of Noetic Sciences*
Petaluma, CA, USA

[2] *Touchstone Services*
Portland, ME, USA

[3] *California Pacific Medical Center*
San Francisco, CA, USA

[4] *Bastyr University*
Seattle, CA, USA

[5] *Saybrook Graduate School*
San Francisco, CA, USA

ABSTRACT

This study investigated the effects of intention on the autonomic nervous system of a human "sender" and distant "receiver" of those intentions, and explored the roles that motivation and training have in modulating these effects. Skin conductance level was measured in each member of a couple, both of whom were asked to feel the presence of the other. While the receiving person relaxed in a shielded room under double-blind conditions, the sending person in another room directed intention towards the receiver during 10-second epochs. These sending epochs were alternated with no-sending inter-epoch periods ranging randomly between 5 and 40 seconds. Thirty-six couples participated in 38 test sessions; in 22 couples one of the pair was a cancer patient. In 12 of those couples, the healthy person was trained to direct intention towards the patient and asked to practice that intention daily for three months prior to the experiment (trained group). In the other 10 couples, the pair was tested before the partner was trained (wait group). Fourteen healthy couples received no training (control group). Ensemble means of the skin conductance measures were determined during the intention epochs and normalized using nonparametric bootstrap procedures. Overall, receivers' skin conductance levels increased during the sending epochs, achieving a peak deviation at the end of the average epoch ($z = 3.9$, $p = 0.00009$, two-tailed). Planned differences in skin conductance among the three groups were not significant, but peak deviations were largest in the trained group, followed by the wait and control groups, respectively. This study confirms previous studies indicating that directing intention towards a distant person is correlated with a rise in that person's autonomic nervous system, and it suggests that motivation to heal and to be healed, and training on how to direct distant intention, may modulate this relationship.

.

INTRODUCTION

A government survey of adult Americans, conducted by the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics, showed that of the top 10 complementary and alternative medicine (CAM) healing practices, the most popular was prayer for self and the second was prayer for others (Barnes, Powell-Griner, McFann, & Nahin, 2004). From a psychological perspective, the former may be thought of as a coping mechanism in the face of uncertainty or dire need. The concept that prayer for self may promote healing is no longer considered controversial because of the growing literature on the salutary effects of meditation and placebo, and perhaps more importantly, the plausibility of psychoneuroimmunological models of self-regulation (Kiecolt-Glaser, McGuire, Robles & Glaser, 2002).

Prayer for others is likewise understandable as a practical coping mechanism, but the idea that it might be efficacious remains contentious. To avoid religious connotations, the neutral term distant healing intention (DHI) is sometimes used in the scientific and medical literature to refer to this concept (Schlitz, Radin, Malle, Schmidt, Utts & Yount, 2003). DHI effects are considered scientifically doubtful because the "distant" in DHI means shielded from all known causal interactions (Wallis, 1996; Sloan & Ramakrishnan, 2005). Science is slowly coming to grips with the concept of "spooky action at a distance" within fundamental physics (Walach, 2005) but so far the idea that nonlocal effects might also exist in living systems evokes as much scorn as it does interest.

Because the mechanisms underlying postulated DHI effects are unknown, most DHI experiments have been concerned with the more straightforward empirical question: Does it work? Some clinical studies suggest that DHI is medically efficacious (Astin, Harkness & Ernst, 2000; Krucoff, Crater, Green et al, 2001), but overall the clinical evidence remains uncertain (e.g., Krucoff, Crater, Gallup et al, 2005).

By contrast, when DHI is tested under controlled laboratory conditions, the evidence is clearer. Meta-analyses indicate that DHI produces repeatable effects in the human autonomic nervous system, detected typically by observing fluctuations in one person's electrodermal activity while another person mentally attempts to "activate" them (Schlitz and Braud, 1997; Schmidt, Schneider, Utts & Walach, 2004). The literature also indicates that DHI can be detected in the central nervous system, as measured in brain electrical activity (Duane & Behrendt, 1965; Grinberg-Zylberbaum J, Delaflor M, Attie L, Goswami A, 1994; Wackermann J, Seiter C, Keibel H, Walach H., 2003; Standish, Kozak, Johnson & Richards, 2004; Radin, 2004b), in hemodynamics (Richards, Kozak, Johnson & Standish, 2005; Achterberg, Cooke, Richards, Standish, Kozak & Lake, 2005), and also in the enteric nervous system (Radin & Schlitz, 2005).

The laboratory evidence may be clearer than the clinical evidence because there are no "competing" intentions to interfere with the test results, such as the prayers of clinical patients' loved ones, and because tiny physiological fluctuations can be objectively monitored in real-time, whereas healing responses may take days or weeks. But the context of laboratory studies is also quite different from that of clinical studies. In the lab, the person assigned to "send" DHI (hereafter called the *sender* or S) is typically a volunteer who is not especially motivated or trained to provide DHI, and the person assigned to receive DHI (the *receiver* or R) is often just curious to see what will happen.[1] Given these low motivational factors, it should not be surprising that the magnitude of effects observed in such studies is small; e.g., the meta-analytic estimate reported by Schmidt et al (2004) is d = 0.11.

The goal of the present study was to see what would happen when the powerful motivations associated with clinical trials of DHI were combined with the controlled context and objective measures offered by laboratory protocols. We also explored the role of training in potentially modulating DHI effects. (Note that the laboratory context did not explicitly test distant *healing* intention per se, but rather the physiological effects of distant intention. With this semantic caveat in mind, the term DHI will be used hereafter for expository ease.)

[1] The terms sender and receiver are used here for expository reasons; they do not necessary imply a signaling model as the underlying mechanism.

METHOD

Participants

Pairs of friends, long-term partners, married couples, and mother-child pairs were recruited to participate in one of three groups. Two of the groups consisted of adult couples, one a healthy person and the other a patient undergoing treatment for cancer. In these groups the healthy partner was assigned the role of the sender and the patient the role of the receiver. In the "trained group," the sender attended a day-long training program involving discussion and practice of a DHI technique based on the Tibetan Buddhism tradition of Tonglen meditation (Chodron, 1996), Judeo-Christian meditation (Lerner, 1995), and Therapeutic Touch (Krieger, 1986).

After attending the training session and practicing the DHI meditation daily for three months, the senders and their partners were tested in the laboratory. In the "wait group," the couple was tested before the healthy partner attended the training. A third group consisted of healthy couples who received no training (the "control" group).

One couple was tested per session. During a session, the couple was asked to maintain a "feeling of connectedness" with each other. To encourage this intentional focus, each person was asked to exchange a personal item, like a ring or watch, and to hold that object in his/her free right hand for the duration of the session. In the control group, couples were asked to decide which of the two might be more receptive, and that person was assigned the role of R. In the trained and wait groups, the cancer patient was always R.

When a couple arrived at the lab, they signed informed consents and then the experimenters prepared them for monitoring five physiological variables. The principal measurement was electrodermal activity (EDA), specifically skin conductance level (SCL), as this is the variable most frequently employed in similar, previous studies. Electrodermal activity was monitored with two electrodes, each filled with an isotonic electrode gel (Biopac GEL101), and attached to the left palm using double-sided adhesive collars (Biopac type TSD203, 8mm Ag/AgCl electrodes). These were monitored by a Biopac GSR-100C EDA amplifier, set to the 0–2µS range.[2]

For exploratory purposes, we also monitored one channel of electroencephalogram (EEG) at C_z, fingertip blood volume on the left thumb (photoplethysmograph, PPG), electrocardiogram (ECG), and abdominal respiration (RESP). Results of those measurements will be reported in another publication. All signals were recorded at either 500 Hz or 1000 Hz, and each participant was monitored on an independent physiological recording system (Biopac M150, Goleta, CA). To assist in the computational process, all raw physiological data were downsampled to 100 Hz before analysis.

Environment

R was asked to relax in a reclining chair inside a double steel-walled, electromagnetically and acoustically shielded chamber, as shown in Figure 1 (Lindgren/ETS, Cedar Park, Texas, Series 81 Solid Cell). R was informed about the general nature of the experiment, that S would be viewing his or her live video image at random times from a distant location, and that during those periods S would try to make a special intentional effort to mentally connect.

A low-light video camera was focused on R's face, and the interior of the shielded room was illuminated with a 25 watt incandescent bulb. Biopac and video signals were routed outside the shielded room via optical fiber (SI Tech, Batavia, IL, Models 2809/2010 and Model 2550) to two computers, one dedicated to recording R's physiological signals and the other used to control the experiment.

To test for possible sensory leakage between the S and R locations, audio tests were conducted to check whether tones as loud as 110dB at 1K Hz sounded in S's room could be detected inside R's shielded chamber. Subjective listening tests and quantitative audio tests using a digital sound level meter (Model 840028, Sper Scientific, Scottsdale, AZ) confirmed that the test tones were indistinguishable from

[2] 2µS per volt, or 0–20µS for the full 10 volt range of the EDA amplifier.

background noise inside the chamber. To further isolate the shielded room from possible infrasound signals the chamber was installed in the basement of a building on a vibration-isolation mat.

After R was settled in the shielded room, S was led through two closed doors to a dimly lit room 20 meters away and asked to sit in a chair about a half-meter in front of a video monitor. The experimenter explained that when the video monitor showed R's image, S was to mentally "connect" with R with as much intensity as possible. The principal experimenter (first author) was blind to whether a couple was in the trained or wait group, but was aware of the condition for the control group participants, the majority of whom were run in the experiment by the last three authors.

S's electrodes were connected to the same model Biopac system as R's, using the same type of amplifiers, settings, and data sampling rates. The digitized outputs from both Biopac systems were transmitted over a local area network and streamed to two Windows-based PCs, each running Biopac's Acknowledge 3.7.1 data collection software (Figure 1).

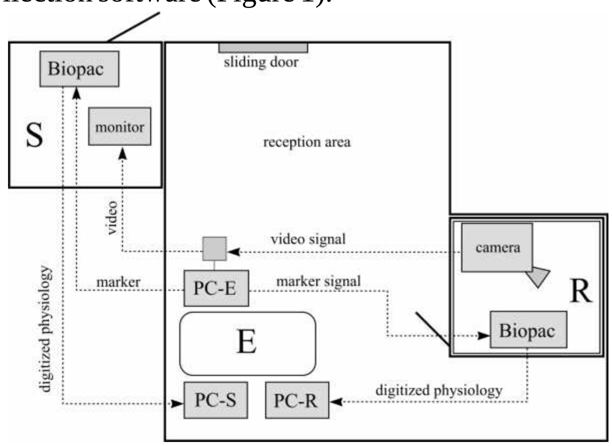

Figure 1. Laboratory layout. The experimenter's workstation (E) consisted of three computers: Two recorded the physiological data from the S (PC-S) and R (PC-R) Biopac systems; the third (PC-E) controlled the random timing of the stimuli and a video switch. The receiver was in an electromagnetically and acoustically shielded room; the sender was in a distant room behind two doors and a double wall.

Stimulus Procedure

The timing of the viewing periods was controlled by a Windows PC running a program written by the first author in Microsoft Visual Basic 6.0. When that program was launched, it created a random timing schedule for either 25 (control group) or 36 (motivated groups) 10-second visual stimulus epochs.[3] Epochs were separated from one another by a randomly determined 5 to 40 second inter-epoch interval (Figure 2). To synchronize the S and R physiological signals, at the beginning of each epoch (at stimulus onset), the computer switched the video signal from R's chamber to the video monitor in front of S and simultaneously sent onset marker signals to both the S and R Biopac systems (using signals generated by an analog to digital circuit, Model ADR-100, Ontrak Control Systems, Sudbury, Ontario, Canada). At the end of each epoch (stimulus offset), the computer switched the video signal off and sent offset markers to the two Biopac systems. After both participants were secured in their respective rooms, the experimenter checked to see if the physiological recordings, marker signals and video switch were operating properly. When everything was in order the controlling program was started and the experimenter attended to other tasks while waiting for the session to end.

[3] The random source was based on Visual Basic's pseudorandom algorithm, seeded by the PC's CPU clock at the beginning of each session. The number of epochs per session was increased for the motivated sessions to provide more data per session.

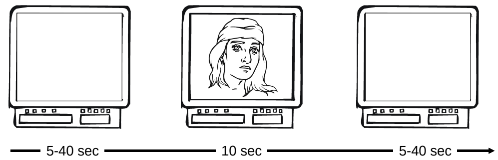

Figure 2. Protocol for sender stimulus. Random inter-epoch intervals ranged from 5 to 40 seconds separated by 10-second distant healing intention periods. The receiver's live video image appeared on the monitor during the sending periods, otherwise the monitor was black.

Hypotheses and Analyses

The principal hypothesis was that S's DHI directed towards the distant, isolated R would cause R's autonomic nervous system to become activated. A secondary analysis explored whether the factors of motivation and training modulated the postulated effect.

In the following description, the term "epoch" refers to the 20 second period from 5 seconds before a stimulus onset to 5 seconds after stimulus offset, and "stimulus epoch" refers to the 10 second DHI period between stimulus onset and offset. The analysis examined skin conductance levels (SCL) averaged across epochs ("ensemble average") to see how S and R responded to DHI in time-synchrony.

To determine the statistical significance of the observed results, the following procedures were independently applied to the R and S SCL data.

1. For each epoch in a given session, subtract the baseline value at stimulus onset to form a measure of change in SCL during the stimulus epoch.
2. Calculate the ensemble mean of the baseline-subtracted epochs in step 1 for each session.
3. Calculate the grand ensemble mean across all sessions of interest (e.g., trained group sessions).
4. Select random starting points in each session, one for each epoch in the original session, and from these create new, 20-second random epochs. Subtract the baseline from each of these random epochs as in step 1.
5. Form the ensemble mean of the random epochs.
6. Do the same for the other sessions, then calculate a grand ensemble random epoch mean.
7. Repeat steps 4 – 6 10,000 times to build up a "bootstrap" distribution of ensemble random epochs that *could have occurred* in the experiment if the original epochs had occurred at different times than they did in the actual experiment (Blair & Karniski, 1993).
8. Normalize each sample in the original ensemble average curve (20 seconds × 100 samples/second = 2,000 samples) using the mean and standard deviation of the bootstrap distribution formed in step 7, as $z_i = (x_i - \mu_i)/\sigma_i$, where i ranges from 1 to 2,000, x_i is sample i from the original ensemble mean, and μ_i is the mean and σ_i the standard deviation of the associated sample from the bootstrap distribution. This step essentially creates a z-score for each sample in the original ensemble epoch. The normalization method weighs each epoch equally, thus potential statistical biasing effects of occasional large differences in SCL due to movement artifacts or individual differences are substantially reduced.

Under the null hypothesis the precise timing of the epochs should not matter because R is thoroughly isolated from S. Thus, if at stimulus offset the normalized ensemble epoch for R significantly deviates from chance (as determined by the bootstrap process), it would suggest that R had responded to S's DHI. To avoid multiple testing problems, the planned formal hypothesis examined the normalized deviation only at stimulus offset.

RESULTS

Participants

A total of 72 people participated in the study (Table 1), including two minors (a mother-son and mother-daughter pair). They consisted of 36 couples who together conducted a total of 40 sessions, 38 of which were usable (two control sessions could not be analyzed because S's physiological data failed to record properly). Ideally, the three groups of participants would have been matched by gender and age, but in practice this was difficult to achieve as the clinical groups mostly involved women with breast cancer, and this tended to skew the age and gender of those groups. In addition, two couples in the control group switched roles as S and R, and all individuals in the control dyads were healthy.

All participants in the trained and wait groups filled out psychosocial questionnaires before and after the training and practice periods to see what effects the training program might have had on the caregiver's feelings about his or her relationship with the patient. Those results will be reported in another publication.

TABLE 1:

PARTICIPANT DEMOGRAPHICS FOR THE THREE GROUPS

Group	**Sessions**	**Couples**	**S age**	**R age**	**S gender**	**R gender**
Control	16	14	7 – 71 (average 41)	24 – 58 (39)	11M / 7F	5M / 13F
Trained	12	12	37 – 84 (55)	38 – 78 (54)	7M / 5F	4M / 8F
Wait	10	10	42 – 77 (57)	41 – 79 (53)	9M / 1F	1M / 9F

(NB. two of the 18 control sessions did not produce usable data).

Data conditioning

Despite efforts to ensure stable physiological recordings throughout each session, some electrodes invariably slipped, participants moved, and electrical glitches caused artifacts to appear in one or more epochs. To ameliorate the biasing effects of artifacts, all epochs were visually inspected and if one or more were contaminated with artifacts, then that whole session was eliminated from further examination. This reduced the potential total of 38 sessions × 5 physiological measures per session, or 190 measure-sessions, to 174, so subsequent analyses were performed on 92% of the data. Fortunately, all usable data were available for the EDA measurements, which were the data of primary interest. Before analyzing the data, all SCL data were smoothed using a one-second sliding average window (± 500 msec).

As shown in Table 2, most of the rejected sessions occurred in the control group. The control group was also based on 25 stimulus epochs per session as compared to 36 epochs in the trained and wait groups. The increase in the number of epochs was introduced after 15 of the 18 original (16 usable) control sessions were completed to provide more data to be collected per session.

TABLE 2:

USABLE SESSIONS PER GROUP

Measurement	Train	Wait	Control
EDA	12	10	16
EEG	10	8	12
PPG	12	10	12
HR	12	10	14
RESP	12	9	15

.

Electrodermal activity

S's SCL across all epochs, sessions and groups increased substantially, reflecting the expected orienting reflex (Figure 3). About two seconds after stimulus onset S's SCL began to increase, peaking 3 seconds later at more than z= 12 standard errors above the baseline. In addition, as predicted by the DHI hypothesis, R's SCL also significantly increased. A half-second after stimulus onset R's SCL began to rise, peaking at stimulus offset at z = 3.9 standard errors over the baseline (p= 0.00009; all p-values cited are two-tailed).

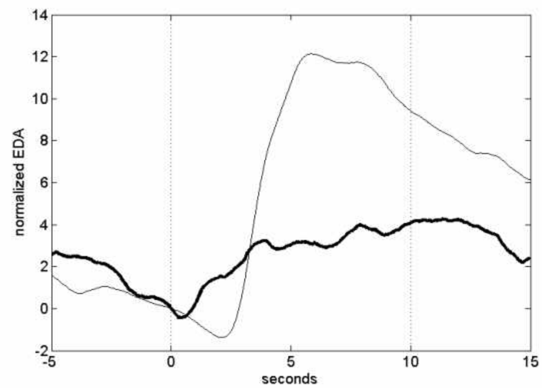

Figure 3. Sender (thin line) and Receiver (bold line) normalized mean electrodermal activity across all 38 sessions (N = 1,104 epochs), from 5 seconds before stimulus onset (at 0 seconds) to 5 seconds after stimulus offset (at 10 seconds) to show the effect in context.

Motivated vs. control groups

Figure 4 is the same analysis applied to just the motivated group (trained group N = 387 epochs; wait group N = 360 epochs; 736 epochs combined, 22 participants). R SCL significantly increased to z= 3.45 (p= 0.0006) at stimulus offset, peaking at 7.8 seconds at z = 4.481 (p= 7.4×10^{-6}).

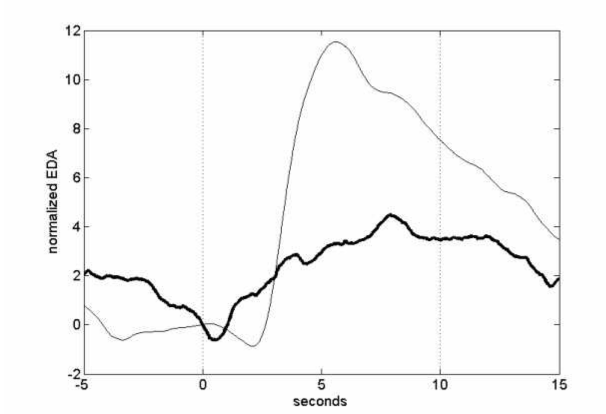

Figure 4. Sender (thin line) and Receiver (bold line) normalized mean electrodermal activity for all motivated sessions, N = 736 epochs.

By comparison, Figure 5 shows that R SCL for the control group (16 sessions, 393 epochs) increased to z = 2.4 (p= 0.02) at stimulus offset. The difference between the motivated and control group outcomes at stimulus offset was not significant (z= 0.73, p= 0.46). When comparing *effect sizes* per stimulus epoch (where $e = z/\sqrt{N}$, N being the number of epochs) as shown in Figure 6, Rs' SCL at stimulus offset was observed to be about the same magnitude in all of the groups.

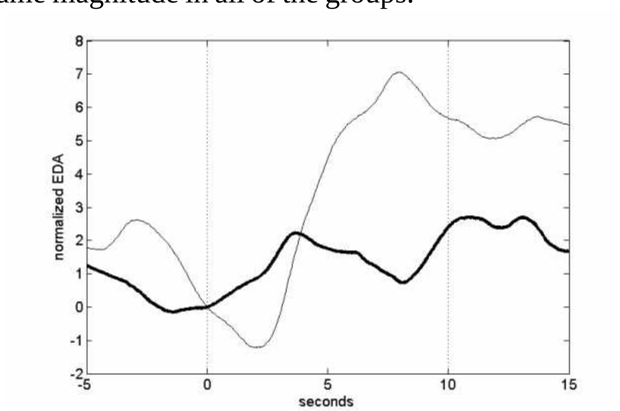

Figure 5. Sender (thin line) and Receiver (bold line) normalized mean electrodermal activity for control sessions, N = 393 epochs.

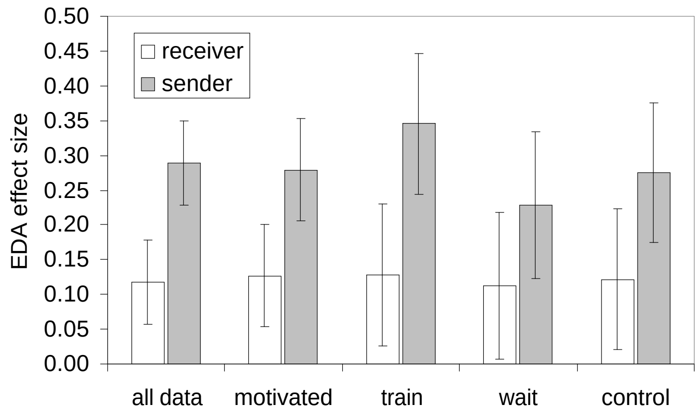

Figure 6. Comparison of Sender and Receiver effect sizes (per epoch) measured at stimulus offset (with ±2 standard error confidence intervals) for all sessions, motivated sessions (trained and wait groups combined), and for trained, wait and control groups separately.

Comparison of the R SCL time course among three groups reveals a more interesting picture, as shown in Figure 7. Receivers in all three groups responded quickly at stimulus onset, but (a) the control group's response subsided after 4 seconds, (b) the wait group's response was initially stronger and subsided after 5 seconds, and (c) the trained group's response continued to progressively rise for 8 seconds, reaching the maximum deviation among all three groups.[4] These differences were not predicted in advance so they must be interpreted with caution, however if future replications continue to show similar patterns, then training plus motivation would appear to enhance R's response over motivation alone, and motivation would appear to enhance the response over interest alone.

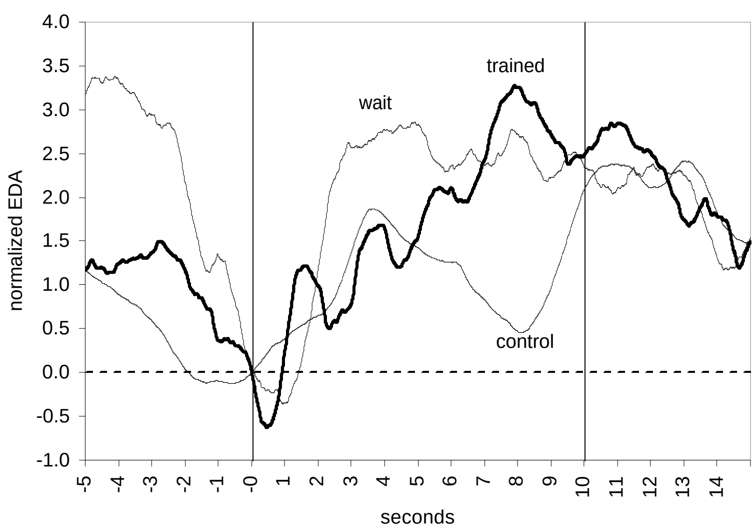

Figure 7. Normalized comparison of the three groups.

[4] In this comparison, the number of epochs in each curve is approximately the same, so the normalized curves are not biased by differences in sample size. Trained = 387 epochs, Wait = 360 epochs, Control = 393 epochs.

DISCUSSION

Analysis of all skin conductance data indicates that DHI had a measurable effect on the receiver's autonomic nervous system. An exploratory analysis of the time-course of SCL over the epoch suggests that the trained group had a slower but more sustained effect, followed by a smaller wait group response, and an even smaller control group response. The overall effect size *per session* for SCL for the motivated sessions was $e = 3.45/\sqrt{2} = 0.74$, some 6.7 times larger than the meta-analytic estimate of effect size per session was $e_{ma} = 0.11$, and surprisingly even the controls were some 5.4 times larger than e_{ma} ($e = 2.4/\sqrt{1} = 0.60$; Schmidt et al, 2004). It might be noted that the absolute magnitudes of these observed effects were still rather small, e.g. for R's SCL the peak changes over baseline amounted to fractions of a microSiemens.

Alternative Explanations

Many artifacts can result in outcomes mimicking a DHI effect. In approximate order of decreasing likelihood, they include measurement artifacts, sensory leakage between S and R, R's anticipation of the stimulus epochs, software artifacts, violation of statistical assumptions, selective reporting, and collusion between S and R.

Potential measurement artifacts include electrical crosstalk that can arise between amplifiers in the same monitoring device, or artifacts induced in the equipment due to electromagnetic (EM) pulses associated with switching the video monitor signal at stimulus onset and offset. The crosstalk issue was completely prevented by using two independent Biopac monitors located 20 meters apart, each with its own data recording computer. The EM pulse issue was significantly ameliorated by the use of a double steel-walled EM-shielded room and 20 meter separation between S and R. This shielded chamber was very efficient at blocking EM radiation above 10 KHz, but it did not block extremely low frequency (ELF) EM signals nor did it shield against magnetic field flux. Living systems are exquisitely sensitive to weak EM and magnetic fields, so bioelectromagnetic factors cannot be absolutely ruled out as potential artifacts. However, prior studies conducted with S and R separated by far distances and under sea water to block ELF, and still showing significant outcomes (in distant perceptual tasks), suggest that electromagnetic artifacts are not a sufficient explanation for the observed results (Schwartz, 1978).

Sensory leakage artifacts include conscious or unconscious visual, auditory, or vibratory cues that might pass between S and R, alerting the R when to respond. Such artifacts were precluded through the use of the two locations and by prior audio and vibration testing. In addition, the experimenters were located between the S and R locations, with no other points of access between the two sites, so any attempt by the couple to communicate through ordinary sensory means would have been detected. Moreover, the physiological state of both participants was continually monitored during the experiment, allowing detection of the smallest bodily movements in either person. No gross motor movements consistent with attempts at signaling were detected in any of the sessions.

For other potential artifacts, could R have anticipated when the stimulus epochs were about to occur, and then respond accordingly? This possibility was prevented through the use of random inter-epoch timing and double-blind conditions. No one knew in advance of a session when each DHI epoch would begin.

Potential violations of the assumptions underlying parametric statistics were avoided by using a nonparametric, computational bootstrap procedure to normalize the ensemble averages. To prevent selective reporting biases, data from all usable epochs across all sessions were analyzed and reported for the measure of principal interest (SCL). Collusion between S and R would have been exceedingly difficult, not only because the EM shielding prevented obvious signaling methods such as sounds and cell phones, but because almost all of the couples participated in only one session, so they did not know what to expect in advance about the laboratory setup or the experimental protocol.

Interpretations

If not due to conventional explanations, then how do we interpret the results? Sloan and Ramakrishnan (2005) asserted that "Nothing in our contemporary scientific views of the universe or consciousness can account for how the 'healing intentions' or prayers of distant intercessors could possibly influence the [physiology] of patients even nearby let alone at a great distance."

But is it true that *nothing* in science suggests the presence of connections between apparently isolated objects? Quantum entanglement, a far from common sense effect predicted by quantum theory and later demonstrated in the laboratory (Walach, 2005), shows that under certain conditions particles that interact remain instantaneously connected after they separate, regardless of distance in space or time. If this property is truly as fundamental as it appears to be, then in principle everything in the universe might be entangled (Radin, 2006). Everyday objects and humans do not appear to show such entanglements, and there are arguments why entanglement would be difficult to sustain in macroscopic systems. Still, one cannot help but wonder what if this concept *did* apply to humans. With an indifferent, unmotivated couple, entanglements between their minds and bodies may be difficult to detect. But in a highly motivated, long-term bonded couple asked to connect mentally, and with S trained to provide DHI, the underlying correlation might become more evident. Such a relational model is appealing because it does not require anything (force, energy, or signals) to pass between S and R. Instead, it postulates a physical correlation that is always present between people (and everything else) due to the "nonlocal threads" from which the fabric of reality is woven (Walach, 2005; Radin, 2006).

Another possible interpretation is that the outcomes of this and similar experiments are due to precognition on the part of the investigators, who manage to begin each session at just the right time so as to match natural fluctuations in R's physiology with the randomly determined moments of stimulus onset and offset. While such an explanation may seem implausible, independent evidence in favor of retrocausal effects in humans continues to accumulate (Radin, 1997, 2004; Spottiswoode & May, 2003; May, Paulinyi & Vassy, 2005; McCraty, Atkinson & Bradley, 2004a, b), so it is not inconceivable. Indeed, because there are as yet no adequate theoretical models that would predict macroscopic correlations akin to DHI, we are obliged to remain open to a wide range of possible explanations.

A key limitation in the present study was the lack of closely matched demographics among the three groups. Given this limitation, it would be imprudent to draw strong conclusions about performance differences among the groups. However, based upon the strong overall support of the formal hypothesis, it is possible to draw one conclusion: *Directing one's attention towards a distant person causes measurable changes in that person's nervous system.* This suggests that DHI is more than a psychological coping mechanism, and that prayer for others is the second most popular CAM modality for a very simple reason: It has measurable effects on the human body. Whether it promotes *healing* remains to be seen.

ACKNOWLEDGEMENTS

This study was supported in part by a grant from The Institute for Research on Unlimited Love.

REFERENCES

Achterberg, J., Cooke K., Richards T., Standish L.J., Kozak L. & Lake J. (2005). Evidence for correlations between distant intentionality and brain function in recipients: A functional magnetic resonance imaging analysis. *Journal of Alternative & Complementary Medicine, 11(6*), 965-971.

Astin, J.A., Harkness E. & Ernst E. (2000). The efficacy of "distant healing": A systematic review of randomized trials. *Annals of Internal Medicine, 132,* 903–910.

Barnes, P., Powell-Griner E., McFann K. & Nahin R. (May 27, 2004). *CDC Advance Data Report #343.* Complementary and Alternative Medicine Use Among Adults: United States.

Blair, R.C. & Karniski W. (1993). An alternative method for significance testing of waveform difference potentials. *Psychophysiology*, *30*, 518-524.

Chodron, P. (1996). *Awakening loving-kindness*. Boston, MA: Shambhala.

Duane, T.D.& Behrendt T. (1965). Extrasensory electroencephalographic induction between identical twins. *Science*, *150*, 367.

Grinberg-Zylberbaum ,J, Delaflor M, Attie L. & Goswami A. (1994). The Einstein-Podolsky-Rosen paradox in the brain: the transferred potential, *Physics Essays*, *7*, 422–427.

Kiecolt-Glaser, J. K., McGuire, L., Robles, T. F., & Glaser, R. (2002). Psychoneuroimmunology and Psychosomatic Medicine: Back to the Future. *Psychosomatic Medicine*, 64, 15-28.

Krieger, D. (1986). The Therapeutic Touch: How to use your hands to help and heal. New York; Prentice Hall.

Krucoff, M. W., Crater, S.W., Gallup, D., Blankenship J.C., Cuffe M., Guarneri M., Krieger R.A., Kshettry V.R., Morris K., Oz M, Pichard A., Sketch Jr M.H., Koenig H.G., Mark D. & Lee K.L. (2005). Music, imagery, touch, and prayer as adjuncts to interventional cardiac care: The Monitoring and Actualisation of Noetic Trainings (MANTRA) II randomised study, *The Lancet*, 366 (9481), 211-217.

Krucoff, M.W., Crater, S.W., Green, C.L., Maas, A.C., Seskevich, J.E., Lane, J.D., Loeffler, K.A., Morris, K., Bashore, T.M. & Koenig, H.G. (2001). Integrative noetic therapies as adjuncts to percutaneous intervention during unstable coronary syndromes: Monitoring and Actualization of Noetic Training (MANTRA) feasibility pilot. *American Heart Journal*, *142* (5), 760-769.

Lerner, M. (1995). *Jewish renewal: A path to healing and transformation*. San Francisco: Perrenial.

May E.C., Paulinyi T & Vassy Z. (2005). Anomalous anticipatory skin conductance response to acoustic stimuli: experimental results and speculation about a mechanism. *Journal of Alternative and Complementary Medicine, 11 (4), 587-8.*

McCraty, R, Atkinson, M. & Bradley, R.T. (2004a). Electrophysiological evidence of intuition: Part 1. The Surprising role of the heart. *Journal of Alternative and Complementary Medicine*, 10, 133–143.

McCraty, R, Atkinson, M. & Bradley, R.T. (2004b). Electrophysiological evidence of intuition: Part 2. A system-wide process? *Journal of Alternative and Complementary Medicine, 10*, 325–336

Radin, D. I. & Schlitz, M. J. (2005). Gut feelings, intuition, and emotions: An exploratory study. *Journal of Alternative and Complementary Medicine, 11* (1), 85-91.

Radin, D. I. (1997). Unconscious perception of future emotions: An experiment in presentiment. *Journal of Scientific Exploration, 11* (2), 163-180.

Radin, D. I. (2004a). Electrodermal presentiments of future emotions. *Journal of Scientific Exploration. 18*, 253-274.

Radin, D. I. (2004b). Event related EEG correlations between isolated human subjects. *Journal of Alternative and Complementary Medicine*, *10*, 315-324.

Radin, D. I. (2006). *Entangled Minds: Extrasensory experiences in a quantum reality*. New York: Simon & Schuster.

Rebert, C.S., Turner A. (1974). EEG spectrum analysis techniques applied to the problem of psi phenomena. *Behavioral Neuropsychiatry*, *6*, 18-24.

Richards, TL, Kozak L, Johnson LC, Standish LJ. (2005). Replicable functional magnetic resonance imaging evidence of correlated brain signals between physically and sensory isolated subjects. *Journal of Alternative and Complement Medicine*, *11(6*), 955-963.

Schlitz, M, Radin D.I., Malle B.F., Schmidt S., Utts, J. & Yount, G.L. (2003). Distant healing intention: Definitions and evolving guidelines for laboratory studies. *Alternative Therapies in Health and Medicine, 9,* A31-A43.

Schlitz, M., & Braud, W.G. (1997). Distant intentionality and healing: Assessing the evidence. *Alternative Therapies*, *3*(6), 62-73.

Schmidt, S., Schneider, R., Utts, J., Walach, H. (2004). Distant intentionality and the feeling of being stared at: Two meta-analyses. *British Journal of Psychology*, 95, 235–247.

Schwartz, S. (1978). *Deep Quest: An Experiment in Deep Ocean Psychic Archaeology and Distant Viewing.* Invited Paper. Annual Meetings of the Southwestern Anthropology Association/ the Association for Transpersonal Anthropology. March 1978.

Sloan, R. P. & Ramakrishnan, R. (2005). The MANTRA II study. *The Lancet*, 366, 1769-1770.

Spottiswoode, S. J. P., & May, E. C. (2003). Skin conductance prestimulus response: analyses, artifacts and a pilot study. *Journal of Scientific Exploration*, 17(4), 617.641

Standish, LJ, Kozak L, Johnson LC, Richards T. J (2004). Electroencephalographic evidence of correlated event-related signals between the brains of spatially and sensory isolated human subjects. *Journal of Alternative & Complementary Medicine*, 10 (2), 307-14.

Wackermann, J., Seiter C, Keibel H & Walach H. (2003). Correlations between brain electrical activities of two spatially separated human subjects. *Neuroscience Letters*, 336, 60-64.

Walach, H. (2005). Generalized entanglement: a new theoretical model for understanding the effects of complementary and alternative medicine. *Journal of Alternative and Complementary Medicine*, 11(3), 549-59.

Wallis, C. (1996). Faith and Healing. *Time*, 58-64.

ASSESSING THE ROLE OF THE SENDER AS A PK AGENT IN ESP STUDIES: THE EFFECTS OF STRATEGY ('WILLING' VERSUS ABSORPTION) AND FEEDBACK (IMMEDIATE VERSUS DELAYED) ON PSI PERFORMANCE

Chris A. Roe & Nicola J. Holt[1]
Centre for the Study of Anomalous Psychological Processes
University of Northampton, Northampton, UK

ABSTRACT

In recent work we have been concerned to evaluate whether the sender plays any active role in successful ganzfeld GESP experiments (e.g., Roe, Holt & Simmonds, 2003; Roe & Holt, in press) by using a random number generator (RNG) as a 'virtual receiver' in a ganzfeld-like experiment. During the sending period descriptive statements were 'selected' from among a pool of 768 items to give a 20-item 'RNG mentation' that could be used by an independent judge. After early success in demonstrating the basic effect, later work considered the effects of varying the lability of the target selection method (Holt & Roe, 2005) using a simplified protocol in which senders were accurately briefed and attempted to influence the RNG; this allowed us to offer immediate feedback in the form of an on-screen display of the selected statements. Target selection method lability was manipulated to give three within-subject conditions: a random number table; a pseudo random process; and a live RNG. Participants were classified high, intermediate or low lability based on a combination of personality and experiential measures. Significant psi hitting was not obtained in any of the randomness conditions, although there was a significant interaction effect between target and sender lability, which emerged for both independent judges ($F_{4,37}$ = 2.891, p = .028 [JW]; $F_{4,37}$ = 4.536, p = .002 [LS]). The present study was designed to confirm that finding and to extend it by considering the possible interaction effects of sending strategy (active/willing versus passive/absorbed) upon feedback type (delayed versus immediate). Forty participants were randomly allocated to one of four conditions differing in sending strategy/feedback type. Each was presented with 24 statements as a virtual reading, consisting of 8 selected using each of the three randomness sources. The direct hit rates for all target systems are at or below mean chance expectation (MCE = 25%). A mixed 3x3 ANOVA found no significant main effects, neither the degree of target lability ($F_{2,74}$ = .074, p = .929), nor the lability of the sender ($F_{2,37}$ = .387, p = .651) significantly impacted upon psi-success. However, there was a significant interaction between target lability and sender lability ($F_{4,74}$ = 2.747, p = .034). This replicates the interaction effect found by Holt and Roe (2005). An unrelated 2 x 2 ANOVA was conducted, using just the mentations produced by the Live RNG, to consider the two factors of sending strategy (absorbed versus willing) and feedback type (immediate and delayed). There was no main effect of sending strategy ($F_{1,36}$ = .029, p = .865) nor of feedback type ($F_{1,36}$ = 2.101, p = .156), and only a suggestive interaction effect ($F_{1,36}$ = 2.310, p = .137).

INTRODUCTION

Many ESP experiments adopt a telepathy design in which psi is conceived as a dyadic interaction between one person ('the sender') who is aware of some randomly-selected target information and one person ('the receiver') who is unaware of that information by normal communication channels. The sender's task is to attempt to convey target information psychically while the receiver adopts a relaxed, passive state that might be sufficiently labile to allow psi-mediated information to come to conscious awareness. In this paper we describe the fourth study in a series that uses a novel protocol to explore more directly the contribution that the sender might make in such a dyad. This protocol has utilised a random number generator (RNG) to act as a 'virtual receiver' that might be analogous to a 'live' receiver in providing a fluid, random system by which to select impressions that could be related to target

[1] This research was funded by the Bial Foundation grant 66/02. We would like to gratefully acknowledge this support.

information, but might avoid some of the difficulties of working with complex and idiosyncratic human systems (see Roe, Holt & Simmonds, 2003).

In the first two studies (Roe et al., 2003; Roe & Holt, in press) the RNG 'virtual receiver' ran in the background during a standard ganzfeld ESP study, in which a 'human receiver' was relaxing and producing 'free-associative' mentation. During the sending period, the RNG selected descriptive statements from among a pool of 768 to give a 20-item 'RNG mentation', and this was used by an independent judge (JW) to select the target clip when presented alongside three decoys. In Study I a suggestive effect was obtained, with a 32.5% hit rate (MCE = 25%; $Z = 1.485$, $p = .069$, 1-t). Study II was intended to replicate this effect but also to compare sender and no sender trials to explore whether the original finding might be attributable to the performance of the judge rather than any sender effect — if the effect persisted on trials where in fact there was no sender then this would be strongly indicative of a judge or experimenter psi effect. Some support was obtained for the hypothesis that senders would exert an influence on the virtual receiver, as psi success (using two independent judges, JW and RD) was higher in trials with a sender than those without (JW sender trials gave 42.1% hits, $Z = .821$, $p = .412$, 2-t, no sender trials gave 17.6% hits, $Z = -.868$, $p = .384$, 2-t; RD sender trials gave 26.3%, $Z = .616$, $p = .535$, 2-t, no sender trials gave 5.9% hits, $Z = -.651$, $p = .516$, 2-t). The outcomes of studies I and II were considered to be sufficiently encouraging to warrant further research.

In Study III of the series (Holt & Roe, 2005) the protocol was simplified by using only a sender and the virtual receiver, obviating the need for a human receiver and allowing for immediate feedback, since the sender could be accurately briefed. In addition, the lability of the target system was manipulated. Twenty-four statements were selected for each trial, from a pool of 416, eight by each of the following processes: a random number table; a pseudo random process; and a live RNG. It was hypothesised that the greatest psi effect would be found with the most labile target system (following Braud, 1981, 1994). Further, drawing upon Stanford's (1978) conformance behaviour model, it was hypothesised that senders with the most 'stable' trait characteristics would achieve higher psi hitting. This expected interaction effect between target and sender lability was found ($F_{4,37} = 9.96$, $p = .001$), as senders with lower trait lability achieved higher psi scores in the highest labile target condition and vice versa.

However, in Study III there was overall lower psi outcome, compared to Studies I and II. Significant psi hitting was not obtained in any of the randomness conditions. We speculated that this may have been due to the overt nature of the RNG task here, which contrasted with the design of previous studies in which the sender's attention was concentrated on the human receiver rather than the RNG. Not only was the sender's goal to influence the RNG made more direct and overt in Study III, which may heighten any skepticism effect, but also participants were able to receive immediate feedback, and were asked to rate the descriptive statements as they were selected. It was presumed, after Parker (2000), that such feedback would be beneficial, but this generalization may not have been valid. In Holt and Roe (2005), post-experimental interviews gave senders the opportunity to describe the strategies they used in attempting to influence the virtual receiver and their experience of participating in the study. 17.5% of participants found that the rating and monitoring of descriptive statements (immediate feedback) inhibited them from becoming absorbed in the target video clip, and they found the dual nature of the task difficult, having to constantly switch between the screen playing the video clip and the screen showing the statements. For example: "I did feel sometimes that I was looking at the screen here with the writing on instead of looking at the picture… and sometimes that was manipulating what I was thinking". 17.5% of participants found the statements frustrating or de-motivating, for example: "I got a bit downcast, thinking, this is not working". This suggests that, for a minority of participants at least, receiving ongoing feedback while sending had a negative effect upon their perceptions of success on the PK task and/or absorption in the task.

Gissurarson (1997) similarly found that immediate feedback was not preferred by all participants; following a qualitative analysis of participants' preferences for piecemeal ongoing feedback or gross delayed feedback during a PK task, he reported that just 44% of participants preferred the ongoing feedback mode. The main reasons for preferring ongoing feedback included that immediate information about performance could help the development of strategies or enable judgements to be made about whether the trial was working, and some described feeling frustrated, lost or lonely with no feedback.

Some participants felt that the feedback was rewarding and encouraging, e.g. obtaining a sense of satisfaction at getting 'points'. However, 30% of participants preferred the non-feedback mode. This was because there was less pressure to do well so they could relax more; plus there were no informational distractions to interfere with concentration. They could be optimistic about doing well without knowing that they had 'missed', which may be inhibiting or off-putting. About 19% of participants felt equally comfortable with both modes of feedback, while 1% disliked both methods. These data tend to suggest that it is not a simple matter of providing feedback or not, but rather how well feedback facilitates the sending strategy that a sender has adopted – conditions that are conducive for some strategies may be inhibiting for others.

Concerning sender strategy, the main distinction that emerged from the post-experimental interviews of Study III was the preference of some senders to 'consciously will' the virtual receiver to produce certain responses, while others preferred to become absorbed in the task itself with more passive volitional strategies: 30% of participants described consciously attempting to influence the random process at some point during the trial, focusing on particular ideas/words or emotions and 'willing' them to appear within the statements, e.g. "I actually thought about it … pull, pull, pull … erm, so yes, I was literally going please say something … yes I was telling the computer to do something!" In contrast, 65% of participants described their activity as 'just doing', simply watching the clip and rating the statements, often with a range of embedded techniques, such as trying to notice something different in the clip each time, free associating or focusing on memories and emotional reactions to the clip, for example: "I totally forgot I was supposed to be sending... I forgot I was a sender; I was just sitting here wondering whether they would be the same … that was it ... I wasn't actually trying to send whatsoever … I forgot". Willing versus 'just doing' strategies did not impact significantly on actual PK success, however ($F_{1,36}$ = .979, p = .320).

When Gissurarson (1997) looked at the exercise of volition in 212 PK trials, a qualitative analysis of sending strategies resulted in the following categories: relaxation, conversation, mental imagery, affective and physical strategies, guessing, resonance and calling for external assistance. These were compared to actual PK performance by calculating the average number of hits by people reporting using each strategy. Resonance resulted in the most hits (an average of 13.67) while talking strategies resulted in the lowest (9.52). Statements of using concentration or will were about in the middle with the average number of hits being 10.42. Gissurarson also looked at the strategies reported by high extra-chance scorers, and 50% of significant results were attributed to three methods: concentration (but not 'will'), 22%; imagery (both goal- and process-oriented imagery), 19%; and resonance, 13%.

In terms of the attitude of a PK agent, Jahn et al. (2000) suggest that intention may not be as important as mind/machine 'resonance'. In support of Gissurarson (1997), Jahn and Dunne (1987) found that the most successful participants associated their success with a sense of 'resonance' with the target system or 'device'. This was described as: "a state of immersion in the process which leads to a loss of self awareness, of myself and the immediate surroundings, similar to the experience of being absorbed in a game, book, theatrical performance, or some creative occupation" (p. 142). Similarly, Faithorn, Edison, Jenks and Tyndall (1988) described that PK agents perceived themselves to be most successful when they were in a paradoxical state of 'effortless effort'. Houtkooper (2002) similarly argues that cognitive interference with intentional effort plays a role in any PK effect, and also describes the optimal state as one of 'effortless effort', lack of ego involvement, passive alertness or resonance, citing the introspective post hoc comments of Thouless (1951), McConnell (1983), and Jahn and Dunne (1987). In an exploratory analysis, Houtkooper (2000) reported that in PK RNG trials where participants reported using a volitional strategy of 'resonance' there was significant psi scoring (no statistics are cited). He extended this work with 74 participants who took part in 271 PK RNG trials (Houtkooper, 2004). Before each run participants recorded the volitional strategy that they tended to use, based on five categories taken from Gissurarson (1997) (imagery, relaxed, resonance, confidence and guessing) in addition to employing their own type of strategy. As predicted, Houtkooper found that the 'resonance' or effortless effort strategy was the only one that resulted in significant PK scoring in terms of a mean shift (t = 1.889, df = 577, p = .03, 1-t). He describes 'resonance' as the absence of conscious striving, a lessening of ego involvement, and an association with absorption (finding that participants who employed this strategy were more prone to absorption, $r = .293$, N = 40, $p < .04$, 1-t). This interpretation concurs with the experimental and anecdotal PK literature, which, overall, suggests that a lack of ego-involvement and reduced conscious striving is associated with psi-success (see, e.g., Stanford, 1993).

If successful PK involves 'resonance' or absorption and the shutting out of cognitive interference, this may be difficult when continually being made aware of one's performance. It may be that feedback and strategy variables will interact, so that although absorbed non-intentional strategies have been more commonly associated with PK success, this need not imply that goal-oriented strategies could not be successful, if given the right operating conditions. For example, Levi (1979) and Morris, Nanko and Phillips (1979) reported higher PK scores when goal-oriented strategies were employed. In both studies the focus was on imagery: the goal-oriented strategy involved imagining vividly the desired outcome (numbers above the MCE of 16); while in process-oriented conditions participants imagined 'energy' flowing from their bodies and intermingling with the RNG device to produce the desired outcome. Levi found higher PK scoring in the goal-directed strategy condition compared to the process-oriented condition – but only when feedback was given. With no feedback the results were in the opposite direction (there was a significant interaction effect between feedback and strategy ($F_{2,48} = 8.18$, $p < .001$), but no significant main effects for either. So, higher PK scoring was obtained in conditions with: 1) a goal-oriented strategy and immediate feedback (which obtained significant psi-hitting with a mean score of 18.79, $t = 2.20$, df = 16, $p < .05$); 2) a process-oriented strategy and no feedback (which obtained a mean score of 17.43, ns). Lower PK scoring was obtained in conditions with: 3) a goal-oriented strategy and no feedback (which obtained a mean score of 13.90, deviating significantly from chance in the psi-missing direction, $t = -2.38$, df = 16, $p < .045$; and 2) a process-oriented strategy with feedback (which obtained a mean score of 14.75, ns). Post hoc tests found a significant difference between feedback conditions in the goal-oriented group ($F_{1,48} = 12.85$, $p < .008$), but not in the process-oriented strategy ($F_{1,48} = 3.84$, $p = .056$). Significant deviations from chance expectation for the RNG output were only obtained in the goal-oriented conditions. Levi interpreted these findings in terms of cognitive effort, which he argued increases with the amount of information processing, and which may be either externally or internally generated. He argued that the internally-generated imagery in the goal-oriented condition (imaging high numbers) matched the feedback information (numbers) rather than interfered with it. This congruence may have led to less cognitive effort, he suggested, and the feedback (actually seeing numbers) may have even enhanced the ability to imagine numbers. Frustration and demotivation may arise, he argued, when there is interference between strategy and feedback. In a post hoc analysis, Levi found that on each trial run the number of hits participants predicted beforehand decreased when the trial involved an increase in cognitive effort (this was a repeated measures design). While these interpretations are speculative, they suggest that an optimal level of cognitive effort facilitates PK scoring, and that feedback and task demands interact. If so, it would suggest that 'conscious willing' for a PK outcome may require immediate feedback in order to monitor success, while 'absorbed' strategies, where attention is focused on the video clip, will be disrupted by such feedback. (But see also Edge & Burke, 1980, who failed to replicate this interaction effect.)

In summary, it appears that feedback may either hinder or facilitate PK success depending on factors as yet not fully understood, but which may relate to the sending strategy employed and the task demands (e.g. whether the PK task is conscious or unconscious). Further, it appears that in PK trials absorption, 'resonance', imagery, and concentration without egoic conscious striving facilitate psi success. However, feedback and volitional strategy may interact. Perhaps conditions that enable the participant to gain optimal enjoyment and reduce performance anxiety or frustration in the task are key factors, or the cognitive demands of different aspects of the task might cause interference. These factors may in part explain why psi performance was lower in Study III where the shift of the sender focus changed from being non-intentional to intentional. It is hoped that this will be elucidated by comparing direct 'willing' strategies with absorbed, non-direct strategies, and by comparing immediate feedback with end-of-trial feedback in these conditions.

Given the reported interaction between trait lability and target lability in Study III, it is possible that the lower overall psi performance may have been due to that sample's high trait lability leading to psi missing in the live RNG condition, in line with Stanford's (1978) conformance model. Sampling from a less creative population may result in better performance here.

Study aims

In Study IV we intend to investigate more directly the effects of having direct feedback, by manipulating both this variable and the sending strategy employed (focused 'willing' directed at the virtual receiver versus absorption in the video clip and association forming process) as delineated in *Table 1*. For these analyses we planned to consider only the RNG-generated mentations so as to allow for meaningful comparisons with the studies described above. In addition, we will revisit Study III's interesting findings by keeping the three data generation methods (random number table, pseudo random process and live RNG) and will seek to replicate the sender trait lability x target lability interaction.

Three predictions are hypothesised using sum of target ranks as the primary outcome measure. For interaction hypotheses psi-performance will be assessed by computing *Z*-scores derived from these sums-of-ranks. Predictions given below are directional but other, exploratory, analyses were conservatively kept as two-tailed.

1. RNG mentations will enable an independent judge to identify the target clip to a greater degree than expected by chance.

2. There will be an interaction between participant lability and target system lability, where less labile senders will demonstrate higher psi performance with more labile target systems, while more labile senders will demonstrate higher psi performance with less labile target systems.

3. There will be greater psi-hitting in the absorbed, process-oriented condition than the willing, goal-oriented PK condition.

4. Overall, there will be greater psi-hitting when trial-by-trial feedback is provided than when feedback is delayed until the end of the trial.

5. There will be an interaction between feedback and strategy variables, where psi-scoring will be highest with: a) willing and statement-by-statement feedback; b) absorption and post-trial feedback.

TABLE 1
2 X 2 CONDITIONS: GOAL (WILLING VERSUS ABSORBED) AND FEEDBACK (STATEMENT-BY-STATEMENT VERSUS POST-TRIAL)

	Absorbed sending strategy	*Goal-directed, willing strategy*
Immediate feedback	Senders were asked to immerse themselves in a randomly selected video clip, and to compare the thoughts that this triggered to the randomly-selected statements that were presented periodically throughout the trial.	As in study III, senders were asked to will the virtual receiver to produce relevant statements and to rate the degree of correspondence of these throughout the session.
Delayed feedback	Senders were asked to immerse themselves in a randomly selected video clip. They were told that there would be a computer running that selected statements and to compare their thoughts to these at the end.	Senders were asked to will the virtual receiver to produce relevant statements but were told that they would not see and rate these until the end of the sending period.

METHOD

Design

A 3x3 ANOVA design was employed to replicate the target-sender lability interaction of study III, where factor 1 (target system lability) has three levels (random number table, pseudo random process and live RNG), and factor 2 (trait lability) has three levels (low, medium and high). However, the primary focus of the study was on the effects of sender strategy and feedback. To assess these factors, an independent 2x2 ANOVA design was adopted that manipulated participant sending strategy ('willing' versus absorption in the task) and feedback type (post-trial feedback versus statement-by-statement 'real time' feedback), as illustrated in Table 1. The dependent variable for overall psi outcome in conditions was the sum of target ranks awarded by independent judges, while the dependent variable for the ANOVA analyses are the *Z*-scores of target ratings. Participants were randomly allocated to one of the four experimental conditions using a random number table.

Participants

An opportunity sampling method was used to draw 40 participants (mean age = 29.38 [range 18-61], 14 males and 26 females). Participants were selected with the lability hypothesis in mind, in order to represent as wide a range of lability as possible. In the current study, participants were recruited from the undergraduate Psychology population (N = 16) and friends and colleagues of NH (N = 24). All participants were naïve in that they had not taken part in, and were not familiar with, previous 'sender as a PK agent' research, the knowledge of which might bias their sending strategy. One individual was recruited to act as an independent judge (JW, who has performed this role in all of the virtual receiver studies to date).

Apparatus

Details of the experimental suite have been described previously (Roe, Sherwood & Holt, 2004). In this study only one experimental room was required – the 'senders' room'. This study used an automated ganzfeld computer system developed by Dr Paul Stevens and written in Microsoft Visual Basic v5 that presented video material via the API for Media Player v7. Video clips are stored digitally as MPEG files, labelled 1a, 1b, 1c etc.

Part of the University of Northampton target pool used in the last study was used for this study, consisting of 48 minute-long digital video clips that were drawn from commercial films to reflect a range of emotions and themes. Clips were arranged in 12 sets of 4 so that members of a set were as distinct as possible. Copies of the target pool are available on CD or DVD from the first author on request. Randomisation is achieved using the Visual Basic pseudo-random algorithm (rnd), seeded using the timer at the start of the program (RANDOMIZE TIMER). Once the 'Start' button has been pressed, the computer first selects a target set, and then selects one of the four clips within that set.

The descriptor pool from which the RNG draws was different from the original study (Roe, Holt & Simmonds, 2003), as a different target pool was used. This consisted of eight statements for each of the 48 clips, and additional 8 statements that described thoughts relating to the task itself, e.g. "I am concentrating very hard", to give a total pool of 392. These statements were coined by the authors to describe the target set, but were intended to be essentially accurate yet not overly-specific (e.g., "I feel dreamy and trancelike" rather than "someone is hypnotising me") so that they were more characteristic of the kinds of descriptions given during ganzfeld stimulation, and also so that they could in principle help identify targets from other sets.

The mentation-generating program was written in QuickBasic v.1, and ran on an ACER Extensa 503T laptop running under Windows 98. The program was adapted from versions used in previous studies so as to be able to compare three different statement-selection methods, using data generation methods as follows:

- **Random number table statements (the Table condition)** for each participant were selected prior to commencement of the study using random number tables (Clark-Carter, 1997, Table X). An entry point to the list was determined using the RND function of a Casio fx-100 scientific calculator to give the row and the item along that row at which to begin the series. Reading from that entry point, digits were considered in sets of threes and each value in the range 001 to 392 was taken to generate a single data file that was sufficiently long to cover all participants in the study. These data were arranged in a 24x40 array, with each row containing the pre-selected statement numbers for a single participant. The program checked whether a statement had already been selected for that participant for that condition, and where this was the case the next value in the series was used[2].
- **Statements using pseudorandom data (the Pseudo condition)** were generated in real time using the INT(RND) command to produce a value between 1 and 392. As for Table data, the program checked whether a statement had already been selected for that participant for that condition, and where this was the case a new value was generated.
- **For RNG data (the Live condition)**, the program sampled an Orion RNG v1.1 attached to a serial port. We required the RNG to generate numbers in the range 1-392, but this exceeds the 'natural' range of RNG outputs that runs from 0-255. Because of difficulties in combining more than one sample in a manner that ensured that all the possible outcomes were equally probable, we adopted a method in which for each selection the RNG was sampled 392 times, corresponding to the 392 statements. The iteration that generated the highest value became the selected statement (e.g., if only sample 117 returned the value 255 then statement 177 was selected). In the event of a tie, then the first sample to generate the joint-highest value was selected. Again the program checked whether a statement had already been selected for that participant for that condition, and where this was the case the process was repeated.

Materials

The standard University of Northampton Participant Information Form (PIF) was adapted for use in this study. The resulting 15-item measure included questions concerning biographical and contact details (6-items); belief in PK (3-items); previous participation in parapsychological studies (2-items); practice of mental/physical disciplines (1-item); creativity (2-items); and self-perceived happiness (1-item). Copies of all in-house measures are available from the first author on request. Participants also completed the same battery of measures pertaining to lability as used by Holt and Roe (2005):

The NEO Five-Factor Inventory (NEO-FFI) (Costa & McCrae, 1992), a 60-item questionnaire with five subscales assessing: neuroticism, extraversion, openness to experience, agreeableness and conscientiousness. Each subscale has 12 items with a five-point Likert scale response format.

The complex partial epileptic signs subscale of The Personal Philosophy Inventory (Persinger & Makarec, 1987), which consists of 16-items pertaining to temporal lobe lability (e.g. visions, hearing inner voices, intense sensations of smells without an obvious source, sense of noesis, perceptual aberrations, bodily vibrations, and dissociation from 'reality') with a dichotomous ('yes'/'no') response scale.

A measure of mood lability, which was developed to screen for bipolar disorders (Akiskal et al. 1995). This consisted of 2-items with a 7-point Likert response scale ranging from 'not at all' to 'very much so': "My mood often changes from happiness to sadness, without knowing why" and "I have frequent ups and downs in mood, with and without apparent cause".

The Emotional Creativity Inventory (Averill, 1999), a 30-item scale with a 5-point Likert response scale that measures three facets of emotional experience: preparedness; novelty; authenticity and effectiveness.

The Creative Cognition Inventory (unpublished measure by Holt), a 29-item scale with a 5-point Likert response scale, assessing the use of different cognitive styles in the creative process, with two main sub-scales: the use of linear versus non-linear cognition.

[2] Although checks were made to avoid repetition of statements within a condition, it was possible for the same statement to be selected and presented for more than one condition.

Each trial was followed by a semi-structured interview in which participants were asked about their subjective impressions of the success of the trial, their experience of participating and the type of sending strategies used.

Procedure

Once recruited for the experiment, participants were allocated to one of the four experimental conditions described in Table 1 using two random numbers (generated by the RAND function on Microsoft Excel) to provide entry points into a random number table (Coolican, 1999, p. 547). Participants were given one of two information sheets depending on their allocated condition, and described, respectively, the rationale and procedure for the 'absorbed' process-oriented and 'willing' goal-directed conditions. Both information sheets were illustrated with photographs, and briefly described what participating in the study involved. These additionally explained participants' right to withdraw from involvement in the research at any point, and invited potential participants to discuss the procedure in more detail with the experimenter before agreeing to participate. Those who expressed further interest were then sent a PIF and other personality questionnaires, which were to be completed ahead of the trial.

Prior to the arrival of each participant, the computer programme was initiated for the experimental condition, ready for the participant to type in their name and initiate the trial. The appropriate instructions were clearly displayed on a notice board in the sender's room, describing the procedure for either the: 'willing' strategy with statement-by-statement feedback; 'willing' strategy with post-trial feedback; 'absorption' strategy with statement-by-statement feedback; or 'absorption' strategy with no feedback post-trial feedback.

On the day of their trial, participants were greeted on arrival at the University and escorted to a reception room that has been specially prepared with comfortable chairs, a coffee table, rugs, paintings and curtains so as to make participants feel as comfortable and relaxed as possible prior to the trial. The experimenter (NH) encouraged an informal and positive atmosphere, discussing the procedure and answering any questions that arose while sharing refreshments. Participants were given an overview of past ganzfeld ESP research that has been conducted at Northampton and were informed that the study was following this by exploring the role and experience of the sender in this process.

Absorbed trials. Participants in the 'absorbed', process-oriented conditions were told that through this research we hoped better to understand the subjective experience of sending, and the types of associations senders might make with target stimuli, how remote their associations may be, and to what extent they may leap from one percept or idea to another, and further how this relates to both personality and creativity. Participants were asked to watch the video clip and try to get absorbed in it, paying attention to its imagery, emotions, perceptual or conceptual content as they wished, and to make associations with the clip. If they wished, participants could write down ideas or draw images with coloured pencils. They were encouraged to either think imaginatively or to simply enjoy the experience and relax, following their thoughts about the clip, the focus being on trying to connect with the content of the clip in some way. As the rationale for this condition focused on exploring the thought processes of senders in the ganzfeld, participants were asked to consider the relationship and links between the video clip and the computer-generated descriptive statements, in order to explore the extent to which sender's thoughts might deviate from the literal content of the target video clip. The 'virtual receiver' was described as a 'statement generator'.

Willing trials. Participants in the 'willing', goal-directed conditions were told that the research was concerned with potential interactions between mind and matter, i.e. psychokinesis, and were briefly informed of previous research using a 'virtual receiver', and were asked to attempt to consciously influence the virtual receiver via ESP-PK. 'Willing' was defined as "consciously controlled mental effort – during the implementation of choice – to strive to make the goal happen" (following Gissurarson, 1997, p. 22). Participants were briefed that their goal was to try to make the virtual receiver select statements that could be related to the video clip, and were asked to consider the degree of correspondence between the clip and computer-generated descriptive statements that were selected throughout the trial.

Immediate feedback trials. In the immediate feedback conditions participants were told that the descriptive statements would be selected randomly by the statement generator programme on a laptop, and these would be shown to them whilst they watched the video clip. After pressing the spacebar on the virtual receiver to initiate the program a statement appeared on the screen after a delay of a few seconds, with a question mark at the bottom of the screen to cue the sender to rate how similar the statement is to their experience (using a 9-point scale, where 1 = not at all similar and 9 = highly similar). When participants typed in a correspondence rating, another statement began to appear after a delay of a few seconds.

Delayed feedback trials. In the delayed feedback condition participants were told that the statements would be randomly selected while they watched the video clip and these would be presented to them consecutively for them to rate after about ten minutes. In the willing condition with delayed feedback, while selecting a statement the words "I'm thinking …" appeared on the screen of the virtual receiver and it produced a 'beeping' to indicate that a 'choice' had been made. In the delayed feedback conditions the statements were selected without displaying them on the screen until all 24 had been selected. At this point they were displayed to the participant as described above, except that there was no delay between the presentation of each statement.

Participants in both conditions were not initially aware of the different randomness conditions in this study or of the different feedback and strategy conditions. As in the previous study (Holt & Roe, 2005), participants in all conditions were encouraged to rate the statements according to the entire content of their experience rather than just literal associations with the target clip, for example feelings of tiredness, seemingly tangential thoughts, etc. All participants were encouraged to focus on enjoying and getting involved in the task. In total twenty-four statements were rated by each sender, eight of each selection type: random number table, pseudo random process, and the live RNG. For each participant the statements were drawn in a consistent sequence from the three lability conditions, and this order was counterbalanced across participants.

When all statements had been presented and rated by a participant a message was displayed, stating that the trial had been completed, thanking the sender for taking part in the study and asking them to inform the experimenter in the adjacent room that they had finished. The experimenter and the sender then chatted informally. Together they reviewed the statements that had been rated above '5' and the experimenter expressed interest in these, commenting on them positively. This reinforcing of close correspondences and ignoring of distant correspondences was introduced to create a 'need' or 'reward' component to the study in order to facilitate psi performance according to Stanford's (1974) PMIR model. Both the sender and experimenter looked at a list of the statements and their correspondence ratings that constituted the saved record of the trial. This led on to a semi-structured interview focusing on the sending strategies that participants had actually used and their experience of participating in the study. The participant then had the opportunity to ask the experimenter any questions about the study or to request feedback about the overall findings of the study to be sent on conclusion of the study.

After completion of all trials in the series, the virtual mentation for each trial, consisting of 24 statements, was separated into three sets of 8 so that statements derived from each of the three statement selection methods (RNG, Pseudo and Table) could be evaluated separately. Thus the independent judge, JW, was provided with 120 mentations to be rated against the target clip and three decoys. The independent judge was blind to this manipulation and to the four strategy x feedback conditions, and each trial was given a new and independent code so that it was not be possible to identify the sequence in which the trials occurred or any pattern between them without cross-referencing.

RESULTS AND DISCUSSION

Target lability and psi performance

The ranks allocated to target clips by the independent judge (JW) based on the mentations generated using three different randomisation methods (Live, Pseudo and Table) are reported in Table 2. The direct hit rates for all target systems are at or below mean chance expectation (MCE = 25%). For both the mentations generated by the random number table and by the live RNG, the direct hit rate is 25% and for the pseudo random process the direct hit rate is 20%. The sum-of-ranks do not differ significantly from MCE in any of the target lability conditions. The small deviations from MCE are in a psi-hitting direction for the random number table target system, and in a psi-missing direction for the pseudo and live RNG target systems. Hypothesis 1, that live RNG mentations would enable JW to identify the target clip to a greater degree than expected by chance, was therefore rejected.

TABLE 2

A COMPARISON OF TARGET RANK FREQUENCIES FOR MENTATIONS BY TARGET SYSTEM

Target System	N	Rank 1	2	3	4	SOR	Z	*p* (2-tail)	r
Table	40	10 (25%)	6 (15%)	20(50%)	4(10%)	98	-.212	.832	.036
Pseudo	40	8 (20%)	10 (25%)	12 (30%)	10 (25%)	104	.495	.620	.078
Live	40	10 (25%)	9 (22.5%)	9 (22.5%)	12 (30%)	103	.354	.724	.056

These effect sizes for the live RNG are smaller than reported in two previous ganzfeld studies for which JW has acted as an independent judge of RNG mentations (Roe, Holt & Simmonds, 2003; Roe & Holt, 2005): these studies had direct hit rates of 32.5% (Z = 1.485, p = .069, 1-t, r = .235) and 42.1% (Z = .821, p = .412, 2-t, r = .188) respectively. In study III, which used a 'virtual receiver' only (the procedure being the same as the 'willing' with immediate feedback condition of the current study), JW's ratings were, as here, close to MCE for the Table and Pseudo target systems (with hit rates of 22.5%), and showed a trend towards psi missing in the live RNG condition, with a hit rate of 12.5% (SOR = 111, Z = 1.485, p = .138, 2-t, r = .235). This may suggest that RNG-mentations are only effective when they constitute an implicit task and that performance reduces to chance once participants are asked to focus on the PK task more overtly. However, one may argue that a global outcome at chance level is not surprising when this analysis includes conditions that are hypothesised to be less psi-conducive than others, and so, any psi effect may be cancelled out. As suggested in study III, any psi effects may be small, and may emerge in a complex system of situational and person variables. Hypothesised interactions will be tested for in the following sections.

Interaction between lability of the sender and lability of the target system

A composite score of sender lability was created, as in Study III (Holt & Roe, 2005). Scores on measures of lability of behaviour, emotions, cognition and experience were summed. These components gave correlations with the composite measure in the expected direction, as follows: positively with the use of non-linear forms of cognition (*rho* = .829, p = .000001, 1-t); emotional creativity (*rho* = .803, p = .000001, 1-t); temporal lobe lability (*rho* = .602, p = .00001, 1-t); openness-to experience (*rho* = .515, p = .0003); neuroticism (*rho* = .378, p = .008, 1-t); mood lability (*rho* = .133, p = .206, 1-t); and negatively with the use of linear cognition (*rho* = -.355, p = .012, 1-t); and conscientiousness (*rho* = -.369, p = .001, 1-t). All correlations were statistically significant, apart from that for mood lability. It was decided to retain mood lability in the lability construct, for purposes of consistency with Study III. Scores on the composite lability measure approximated the normal curve (Kolmogorov-Smirnov statistic = .712, df = 39, p = .691), ranging between 61 and 210, with a mean score of 167 and an SD of 34.79.

A mixed 3x3 ANOVA was conducted, with psi performance (Z-scores) as the dependent variable. Factor 1 was 'target system lability', within-subjects with three levels: Table, Pseudo and Live. Factor 2 was 'sender lability', and was a between-subjects measure with three levels: low (N = 13); medium (N = 14) and high (N = 13) scores on the composite lability measure (based on a 3-way split). There were no significant main effects, neither the degree of target lability ($F_{2,74}$ = .074, p = .929), nor the lability of the sender ($F_{2,37}$ = .387, p = .651) significantly impacted upon psi-success. However, there was a significant interaction between target lability and sender lability ($F_{4,74}$ = 2.747, p = .034). This supports Hypothesis 2 and replicates the interaction effect found previously, albeit with a smaller effect size. The form of the target x sender lability interaction is displayed in Figure 1.

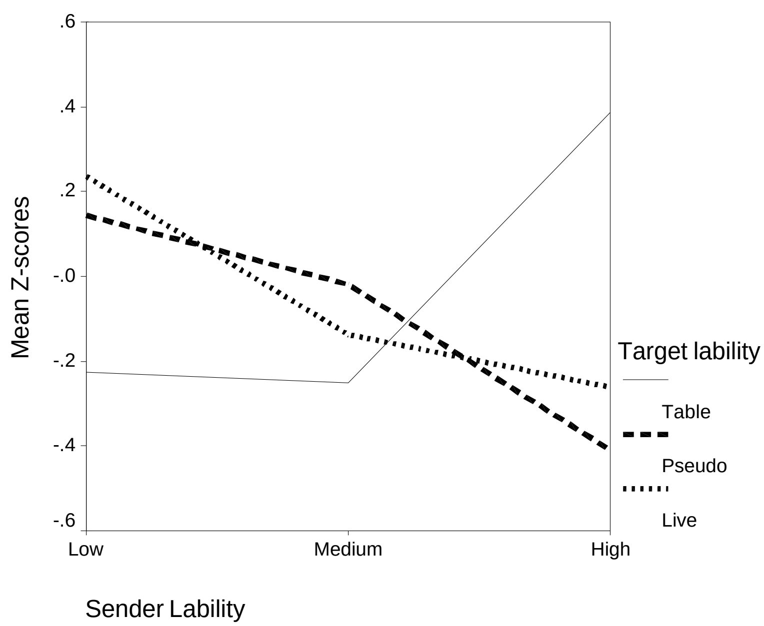

Figure 1 interaction between target and sender lability on psi performance

As predicted, stable (low lability) senders performed at the highest level with statements generated by the most labile system (the live RNG) (with a hit rate of 46.15%, Z = -.744, p = .228, 1-t, r = .206), while highly labile senders performed at the lowest level with statements generated by the live RNG (with a hit rate of 15.38%, Z = 1.116, p = .132, 1-t, r = .310). Conversely, highly labile senders performed at the highest level with statements generated by the most stable system (the random number table) (with a hit rate of 46.15%, Z = -1.737, p = .041, 1-t, r = .482), while 'stable' senders performed at the lowest level in this condition (with a hit rate of 7.69%, Z = .496, p = .301, 1-t, r = .138). However, it appears that rather than 'medium labiles' obtaining more psi hitting in the pseudo random condition (the 'medium' labile system), as was observed in study III, performance for medium labiles more closely followed the pattern of the live RNG, although the hit rate (38.46%) was highest in the pseudo condition.

Conducting post-hoc tests revealed that the interaction effect consisted of the following significant differences: high lability senders had significantly higher Z-scores in the least labile Table condition than the more labile Live condition ($t[12]$ = 2.758, p = .009, 1-t) and stable senders had significantly higher Z-scores in the live RNG condition than the table condition ($t[12]$ = -1.931, p = .039, 1-t). This replicated the findings of Study III as predicted by hypothesis 2. However, in this study high labiles also scored significantly lower in the Pseudo condition than the Table condition ($t[12]$ = -2.552, p = .025, 2-t, the sum-of-ranks for the pseudo condition with high labiles showing a trend towards psi-missing, where Z = 1.488, p = .137, 2-t, r = .413).

There appears, therefore, to be a consistent pattern across study III and the current study, where stable (low labile) senders perform best (in a psi hitting direction) with labile target systems (the live RNG), while highly labile senders perform best with stable target systems (the random number table). This patterns is consistent with Braud's (1981, 1994) lability hypotheses and his extension of Stanford's (1978) conformance behaviour model, suggesting that in a PK task 'order' may be introduced into randomnicity under certain optimal conditions. Further, these findings emphasise a bi-directional process between the labile and stable aspects of a system, and would seem to warrant further investigation.

The effect of strategy (goal-oriented versus absorption) on psi-outcome in the Live RNG condition

The ranks allocated to target clips in the absorbed, process-oriented condition and the willing, goal-directed are displayed in Table 3. These are based on the mentation generated by the Live RNG only, in order to allow comparison with previous micro-PK research that has focused on the effects of intent upon RNG output. There was no significant psi-hitting in either the absorbed or the willing condition. There was a hit rate of 30% in the absorbed condition and a hit rate of 20% in the willing condition, which is in the expected direction but is well within chance expectation ($F_{1,36}$ = .029, p = .865) so that Hypothesis 3 must be rejected.

TABLE 3

A COMPARISON OF SENDING STRATEGIES (WILLING VERSUS ABSORBED) BY TARGET RANK FREQUENCIES FOR MENTATIONS SELECTED BY THE LIVE RNG

Sending strategy	N	Rank 1	2	3	4	SOR	Z	p (2-tail)	r
Absorbed	20	6 (30%)	2 (10%)	5 (25%)	7 (35%)	53	.500	.611	.112
Willing	20	4(20%)	7 (35%)	4(20%)	5(25%)	50	.100	.920	.022

We should note, however, that participants in the 'absorbed' condition did not report significantly higher levels of 'engagement and absorption with the video clip' than those in the willing condition (Mann-Whitney U = 174.50, Z = -.734, p = .232, 1-t). In fact, the mean score rating (from 1, 'not at all' to 7, 'very absorbed') was actually higher in the willing condition (3.65) than the absorbed condition (3.30). Hence, one may question whether the experimental manipulation was successful in encouraging a deeper level of imaginative involvement with the target material in the 'absorbed' condition. The main difference between the goal-oriented and absorbed conditions may simply be awareness of the PK task, i.e. overt, intentional, goal-directed interaction, versus, covert, indirect interaction. Senders in the willing condition may have used an absorbed strategy, highlighting that individuals vary in their predisposition towards different attentional strategies in PK tasks, as shown by Gissurarson's (1997) work.

The effect of feedback (delayed versus immediate) on psi-outcome in the Live RNG condition

The ranks allocated to target clips in the conditions with immediate, ongoing feedback (i.e. seeing and rating the descriptive statements as they were selected by the 'virtual receiver') and the conditions with delayed feedback (i.e. rating all the statements at the end of the sending period) are displayed in Table 4. There was no significant psi-hitting in either conditions with immediate feedback or delayed feedback. As predicted, there was a higher hit rate with immediate feedback compared with delayed feedback (35% vs 15%), which might suggest that receiving immediate feedback concerning one's performance facilitates psi success, or that receiving no feedback while sending may lead to psi-missing. However, this difference did not reach statistical significance ($F_{1,36} = 2.101$, $p = .156$); while it is consistent with the work of Parker (2000), who found that psi-success in ganzfeld ESP studies was enhanced when senders could hear the mentation of the receiver, it cannot be taken as a confirmation of it.

TABLE 4:

A COMPARISON OF FEEDBACK CONDITIONS (IMMEDIATE VERSUS DELAYED) BY TARGET RANK FREQUENCIES FOR MENTATIONS SELECTED BY THE LIVE RNG

Feedback	N	Rank 1	2	3	4	SOR	Z	*p* (2-tail)	r
Immediate	20	7 (35%)	5 (25%)	3 (15%)	5 (25%)	46	-.070	.944	.016
Delayed	20	3 (15%)	4 (20%)	6 (30%)	7 (35%)	57	1.300	.194	.291

Interaction between sending strategy and feedback

While both main effects were in the predicted direction, neither the manipulation of sending strategy nor of feedback gave rise to significant differences in psi-outcome. The final hypothesis concerning the manipulation of situational effects predicted an interaction between feedback and strategy variables, where psi-scoring was expected to be highest with: a) willing and statement-by-statement feedback; b) absorption and post-trial feedback.

The ranks allocated to the target clips in each of the four experimental conditions are displayed in Table 5: Absorbed sending strategy with immediate feedback (AF); absorbed sending strategy with delayed feedback (AD); willing, goal-directed strategy with immediate feedback (WF); and willing, goal-directed strategy with delayed feedback (WD). Again, these are based on the mentations generated by the Live RNG only. In both the absorbed conditions the hit rate was above MCE, at 30%. These deviations from chance were not, however, statistically significant (for AF, $p = .888$, 2-t; for AD, $p = .672$, 2-t). This refutes the prediction that when attempting to get absorbed in the video clip, participants would perform less well with immediate feedback as they may be distracted by the descriptive statements. It may be that, in line with Levi's (1979) 'cognitive effort' hypothesis, the feedback 'matched' the task at hand — making and considering associations with the video clip — and hence did not inhibit psi performance.

In the willing, goal-directed conditions there is, however, a marked difference in psi scoring according to whether or not feedback was received. When senders received ongoing, immediate feedback there was a hit rate of 40%, with a trend towards psi hitting ($p = .203$, 2-t). Conversely, when the senders received no feedback while attempting to influence the virtual receiver, but rated the statements subsequently, there were no direct hits, with a trend towards psi-missing of the same magnitude as the with feedback condition ($p = .203$, 2-t). While these sum-of-rank analyses do not reach statistical significance, the effects sizes of $r = .403$ are however of a moderate size. It is worth reflecting on the low statistical power of the design, with a sample size of merely 10 in each condition. This outcome concurs with the prediction that when striving for a PK effect, ongoing feedback concerning ones performance will enhance performance, while no feedback may inhibit performance.

To test Hypothesis 5, an unrelated 2 x 2 ANOVA was conducted, where Z-scores based on the ratings of the independent judge using the mentations produced by the Live RNG were the dependent variable, and the two factors were: sending strategy (with two levels: absorbed versus willing) and feedback (with two levels: immediate and delayed). The F-ratios and associated probabilities for the main effects were presented in the previous sections, and were not statistically significant.

TABLE 5:

A COMPARISON OF TARGET RANK FREQUENCIES FOR MENTATIONS BY TARGET SYSTEM

Condition	N	Rank 1	Rank 2	Rank 3	Rank 4	*SOR*	*Z*	*p* (2-tail)	r
AF	10	3 (30%)	1 (10%)	3 (30%)	3 (30%)	26	.141	.888	.045
AD	10	3 (30%)	1 (10%)	2 (20%)	4 (40%)	27	.424	.672	.134
WF	10	4 (40%)	4 (40%)	0 (0%)	2 (20%)	20	-1.273	.203	.403
WD	10	0 (0%)	3 (30%)	4 (40%)	3 (30%)	30	1.273	.203	.403

The interaction between sending strategy and feedback approached but failed to reach statistical significance ($F_{1,36} = 2.310$, $p = .137$). The pattern of this interaction is illustrated in Figure 2, mirroring the ranked scores in Table 5. In the willing condition, receiving immediate feedback appears to have increased psi hitting, while delayed feedback appears to have inhibited psi-hitting. In the absorbed condition, feedback appears to have had little impact. This outcome partially supports the prediction that greater psi hitting would arise in two conditions: willing with immediate feedback; and absorption with delayed feedback — only the former being weakly supported by the data. These findings are similar to those of Levi (1979) who only found a significant difference between feedback versus no feedback conditions in a goal-directed PK task, and not in a process oriented PK task. Levi also found psi-hitting with feedback and psi-missing without feedback during the goal-directed task.

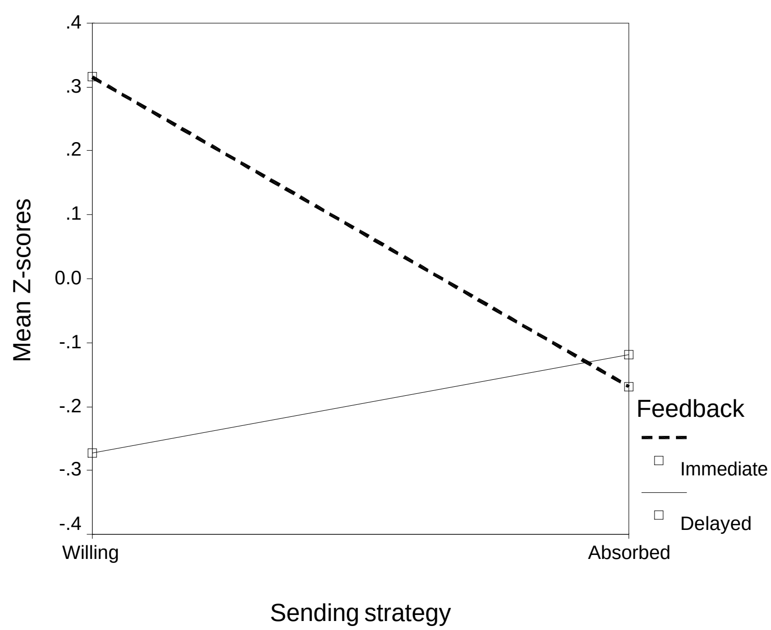

Figure 2 Interaction between sending strategy and feedback

Conclusions

The main outcome of the current study is that an effect reported previously (Holt & Roe, 2005) has been replicated, whereby highly labile senders perform better with more stable PK targets, and low labile senders perform better with more labile PK targets. Although this is one among quite a large number of analyses reported here, and so may leave us susceptible to committing a Type I error, it is important to note that many of these analyses are *post hoc* multiple comparisons that are intended to elucidate upon significant outcome from just two pre-planned ANOVA analyses. These follow-up simple effects would need to be replicated before any great claims for them would be made. In the case of both ANOVA analyses, a predicted interaction effect was found, giving effect sizes that one anonymous referee described as 'remarkably strong'. Indeed, throughout this series of studies, the effect sizes seem to be some orders of magnitude greater than is typical in PK studies (see Roe et al., 2003, Roe & Holt, in press) which may be a consequence of the method of combining RNG samples to give a single metric of performance in a manner that has some psychological meaning for participants. This paradigm continues to show promise, though perhaps simpler designs with fewer variables might give clearer outcomes.

However, it is also clear from this study that any PK sender effect is sensitive to situational variables, but that these form complex interaction patterns (particularly with feedback in the willing condition, and between task demands and personality), so that simple designs may end up being simplistic. As predicted from previous research, willing in a PK task was facilitated by receiving immediate feedback concerning one's performance. This suggests that feedback was not a psi inhibitory factor in Study III, and neither perhaps was the overt goal-directed nature of the task. Rather, the high lability of the participants in Study III compared to Study IV may have led to psi missing overall, high lability being associated with psi missing on the live RNG and psi hitting on the Table target system.

References

Akiskal, H., Maser, J., Zeller, P., Endicott, J., Coryell, W., Keller, Warshaw, M., Clayton, P., & Goodwin, F. (1995). Switching from "unipolar" to bipolar II: An 11-year prospective study of clinical and temperamental predictors in 559 patients. *Archives of General Psychiatry, 52*, 114–123.

Averill, J. (1999). Individual differences in emotional creativity: Structure and correlates. *Journal of Personality, 67*, 331-371.

Braud, W. (1981). Lability and inertia in psychic functioning. In B. Shapin & L. Coly (Eds) *Concepts and theories in parapsychology*. New York: Parapsychology Foundation, inc. pp. 1-36.

Braud, W. (1994). The role of mind in the physical world: A psychologist's view. *European Journal of Parapsychology, 10*, 66-77.

Clark-Carter, D. (1997). *Doing quantitative psychological research: From design to report*. Hove, East Sussex: Psychology Press.

Coolican, H. (1999). *Research methods and statistics in psychology*. London: Hodder & Staughton.

Costa, P., & McCrae, R. (1992). *Professional manual: Revised NEO personality inventory (NEO PI-R) and NEO five-factor inventory (FFI)*. Florida: Psychological Assessment Resources, Inc.

Gissurarson, L. (1997). Descriptive analysis of mentations on volitional tasks. *Journal of the Society for Psychical Research*, *62*, 22-35.

Edge, H. & Burke, K. (1980). The effect of feedback and awareness on a PK task. W. Roll (Ed.), *Research in parapsychology 1979*, pp. 158-159. Metuchen, NJ: The Scarecrow Press.

Faithorn, L., Edison, R., Jenks, S. & Tyndall, S. (1988). An ethnographic study of the 'remote action project': a psychokinesis training program. *Research in parapsychology 1987*, pp. 27-31. Metuchen, NJ: The Scarecrow Press.

Holt, N., & Roe, C. (2005). the sender as a PK agent in ESP studies: The Effects of agent and target system lability upon performance at a novel PK task. Savva, L. (Ed.), *Proceedings of presented papers: The Parapsychological Association 48th Annual Convention*. 57-70.

Houtkooper, J. (2000). Mind-machine interaction: Two phases of replication in Giessen. F. Steinkamp (Ed.), *Proceedings of presented papers: The Parapsychological Association 43rd Annual Conference*, p. 419.

Houtkooper, J. (2002). A pilot experiment with evoked psychokinetic responses: Circumventing cognitive interference? C. Watt (Ed.), *Proceedings of presented papers: The Parapsychological Association 45th Annual Conference*, pp. 104-115.

Houtkooper, J. (2004). Exploring volitional strategies in the mind-machine interaction replication. S. Schmidt (Ed.), *Proceedings of presented papers: The Parapsychological Association 47th Annual Conference*, pp. 51-65.

Jahn, R., & Dunne, B. (1987). *Margins of reality: The role of consciousness in the physical world.* San Diego, CA: Harcourt Brace Jovanovich.

Jahn, R., Dunne, B., Bradish, G., Dobyns, Y., Lettieri, A., Nelson, R., Mischo, J., Boller, E., Bösch, H., Vaitl, D., Houtkooper, J., & Walter, B. (2000). Mind/machine interaction consortium: PortREG replication experiments. *Journal of Scientific Exploration*, *14*, 499-555.

Levi, A. (1979). The influence of imagery and feedback on PK effects. *Journal of Parapsychology*, *43*, 275-289.

McConnell, R. (1983). Unconscious characteristics of psi. In *An introduction to parapsychology in the context of science*, pp. 130-138. Pittsburg: McConnell.

Morris, R. Nanko, M., & Phillips, D. (1979). Intentional observer influence upon measurements of a quantum mechanical system: A comparison of two imagery strategies. In W. Roll (Ed.), *Research in Parapsychology*, 1978. (pp. 146-150). Metuchen, NJ: The Scarecrow Press.

Parker, A. (2000). A review of the ganzfeld work at Gothenburg University. *Journal of the Society for Psychical Research*, *64*, 1-15.

Persinger, M., & Makarec, K. (1987). Temporal lobe epileptic signs and correlative behaviors in normal populations. *The Journal of General Psychology*, *114*, 179–195.

Roe, C., & Holt, N. (in press). A further consideration of the sender a PK agent in ganzfeld ESP studies. *Journal of Parapsychology*.

Roe, C., Holt, N., & Simmonds, C. (2003). Considering the sender as a PK agent in ganzfeld ESP studies. *Journal of Parapsychology*, *67*, 129-145.

Roe, C. A., Sherwood, S. J., & Holt, N. (2004). Interpersonal psi: Exploring the role of the sender in ganzfeld ESP tasks. *Journal of Parapsychology*, *68*, 361-380.

Stanford, R. (1974). An experimentally testable model for spontaneous psi events. II. Psychokinetic events. *Journal of the American Society for Psychical Research*, *68*, 321-356.

Stanford, R. (1978). Toward reinterpreting psi events. *Journal of the American Society for Psychical Research*, *72*, 197-214.

Stanford, R. (1993). ESP research and internal attention states: Sharpening the tools of the trade. In L. Coly & J.D.S. McMahon (Eds) *Psi research methodology: A re-examination*. New York, NY: Parapsychology Foundation, Inc. 189-250.

Thouless, R. (1951). A report on an experiment of psycho-kinesis with dice, and a discussion of psychological factors favouring success. *Proceedings of the Society for Psychical Research*, *49*, 107-130.

ASSESSING THE ROLES OF THE SENDER AND EXPERIMENTER IN DREAM ESP RESEARCH[1]

Chris A. Roe[*], Simon J. Sherwood[*], Louise Farrell[*], Louie Savva[*], & Ian Baker[#]

[*]*Centre for the Study of Anomalous Psychological Processes, The University of Northampton*
[#]*Koestler Parapsychology Unit, The University of Edinburgh*

ABSTRACT

The aim of this study was to explore the role of the sender in a dream ESP task; more specifically it was a conceptual replication of an earlier ganzfeld study (Roe, Sherwood & Holt, 2004) that manipulated the presence of a sender (sender, no sender) and considered the receiver's expectation concerning the sender's presence. Forty participants each completed a sender and a no sender trial on consecutive nights by sleeping at home as normal but keeping a dream diary to record all mentation that they could remember when they awoke. The order of completing sender and no sender trials was determined randomly and participant and experimenter were blind as to the order until after they had completed their judgments. On no-sender nights a video clip was randomly selected as target and played repeatedly from 2:00 until 6:30 a.m. On sender nights this was repeated except that a sender (SS or CR) would watch the clip between 6:00 and 6:30 and attempt to communicate its content to the receiver. The sender had no contact with the receiver at any stage. The primary outcome measure was specified in advance as the z score based upon similarity ratings of the target relative to those for three decoy video-clips. Although both sender and no sender conditions produced above chance hit rates (30% and 35% respectively), performance in neither condition deviated significantly from chance by our primary measure (sender night: $t(39) = 0.92$, $p=0.18$; no sender night: $t(39) = 1.11$, $p= 0.14$) and there was no difference between conditions ($z=-0.22$, $p=0.41$, one-tailed). Contrary to expectations, there was a nonsignificant tendency for z-score ratings to be greater for trials when the participants did not expect a sender than when they did expect a sender ($z = -0.18$, $p=0.46$, one-tailed). These data do not therefore support the proposal that senders play an active role in dream ESP success. An intriguing interaction between sender status (present vs absent) and sender identity (CR vs SS) is discussed, along with possible improvements in the manipulation of participant expectancy.

INTRODUCTION

J. B. Rhine's advice to those who hoped to study psi in the laboratory involved an analogy with making rabbit stew; "If you want to have rabbit stew, first catch the rabbit" (Stanford, 1993, p. 129). Thus if we are to study the action of psi in the laboratory we need to ensure that all aspects of the laboratory situation are arranged so as to facilitate (or at least not inhibit) its occurrence. Psi phenomena are not renowned for their experimental reliability (e.g., Beloff, 1983, Milton & Wiseman, 1999, see Shapin & Coly, 1985 for an extended discussion), and all too often we have been left to feed on scraps. It might be naïve to expect replication on demand given the effect sizes typically involved (cf. Utts, 1991), but nevertheless there must be a suspicion that psi is sensitive to some factors that have not been adequately explored or typically are not controlled for effectively. If different laboratories differ in these subtle respects it could lead superficially similar experiments to generate different outcomes, as some enjoy rabbit stew while others settle for vegetable broth. Efforts to identity potential confounding factors promise to inform us of the necessary conditions to capture psi more consistently as well as perhaps offering some insight into its *modus operandi*.

In looking to map these necessary conditions we have recently been especially concerned to consider the sender-receiver-experimenter dynamic as a factor (or collection of factors) that moderates psi performance in ganzfeld ESP trials (Roe, Sherwood & Holt, 2004; Sherwood, Roe, Holt & Wilson, 2005).

[1] We would like to thank the Perrott-Warrick Fund, Trinity College, Cambridge for their support of this project.

In the first of these studies (Roe et al., 2004) we attempted to distinguish between the active contribution a sender might make and the positive effects of simply believing that a friend was viewing the target. The direct hit rate was exactly at chance (25%) and, although this was slightly better for sender trials than no sender trials (26.1% versus 23.5%) and better for trials on which the receiver believed there was a sender than when they believed there was not, irrespective of whether there actually was one (33.3% versus 18.2%), there were no significant differences between conditions based on z scores of target ratings (for sender status p = .632; for sender expectancy p = .765). In a subsequent study we explored whether participants' perceptions of the experimenter and of the experimenter's attempts to generate a warm social ambiance were predictive of performance (Sherwood et al., 2005). Here both participants and the experimenter completed an interaction questionnaire that asked about their mood, expectations of success and sense of rapport with the other participants. Responses on the interaction questionnaire suggested that participants were typically in a good mood, fairly relaxed, optimistic about the trial — though not confident of success — and had a positive perception of the experimenter, all of which were expected to be psi conducive features. Nevertheless, the direct hit rate for this study was nonsignificantly worse than chance (21.1%, z = -.015). However, although relationships between these variables and trial outcomes (in terms of Z scores for similarity ratings) did not exhibit a clear pattern and tended to vary somewhat from experimenter to experimenter, they did offer some promising overall relationships, such as with receiver mood (negative-positive; *rho* = -.335), sender optimism (*rho* = .432) and confidence of success (*rho* = .398) which we felt warranted further work.

We planned to follow up these findings by conducting a further study that would investigate the effects of both sender and experimenter upon the receiver's ability to identify a target video clip based on correspondences with their own mentation. However, using the ganzfeld as a method of eliciting psi has proved to be very labour intensive, and may have deterred some participants from volunteering because of the time commitment required and the coordination necessary when involving a sender and receiver. In looking for an alternative method we were encouraged to reconsider dream ESP as a paradigm, since there is evidence of above chance scoring among post-Maimonides studies using experimental designs using a simplified method that does not require REM monitoring or access to sleep laboratories (e.g., Dalton, Steinkamp & Sherwood, 1999; see Sherwood & Roe, 2003, for a review).

In considering previous dream ESP research we can derive some encouragement for suggesting that sender and experimenter effects might be evident here too. For example, Ullman, Krippner and Vaughan (1973), in reflecting on the very successful Maimonides dream ESP series commented that "[T]he active involvement of the agent [sender] is an important ingredient for success." (p. 212), and the majority of Maimonides studies investigated telepathy rather than clairvoyance, which might be interpreted as a tacit acknowledgement that a sender can facilitate success in a dream ESP task. However, this presumption was not supported in Sherwood and Roe's (2003) summary analysis, which suggested that overall the clairvoyance studies in this series had been more successful than those intended to study telepathy. Of course, making comparisons across studies may be misleading, since they could have differed in other ways besides whether or not they involved a sender, and we expected that a direct comparison within a single study should clarify this relationship.

There is also some suggestion in the database of post-Maimonides dream ESP studies that some groups of researchers have been markedly more successful than others (see Sherwood & Roe, 2003, pp. 102-4). Given the diversity of approaches used in these studies it is difficult to attribute these differences to one particular cause, but it may be worthwhile to consider whether differences in experimenter-participant interaction have some effect.

STUDY AIMS

This study employed a repeated measures design to assess the role of the sender in dream ESP research, with each participant completing a sender and a no sender trial night. Participants remained blind as to which night was which but were asked to nominate on which night they felt there was a sender so as to allow us to consider expectancy effects. Potential psychological experimenter effects will be assessed by correlating participant and experimenter ratings of their interaction against task performance. In all cases the dependent variable was pre-specified to be the z score of target clip ratings.

METHOD

Participants

Forty participants were recruited from a variety of sources including the undergraduate population, appeals to the media and an established research database. The sample consisted of 30 females and 10 males (Mean age = 32.08; range = 19-62; mean score on belief measure = 80.32, range = 19-119 [absolute range of scale = 19-133, midpoint = 76]), of whom 21 had practised a mental discipline e.g. meditation/relaxation techniques at some point and 15 had practised a physical discipline e.g. Yoga/martial arts. Participants slept in their own homes and came to the University of Northampton for judging. Participants were not selected on the basis of their gender or age; neither were they screened for prior experience or for ability to recall dreams. For trials 1-26, Louie Savva (LS) acted as experimenter; for trials 27-40 Louise Farrell (LF) acted as experimenter.

Apparatus

This study used an automated program for selecting and playing video clips that was developed by Dr Paul Stevens and written in Microsoft Visual Basic. Video clips are stored digitally as MPEG files, labelled 1a, 1b, 1c etc. The target set consists of 116 minute-long digital video clips arranged in 29 sets of 4. These were the same clips used in our previous ganzfeld studies (Roe, et al., 2004; Sherwood et al., 2005) and have mainly been produced at the University of Northampton and are drawn from popular television programmes and commercial films, although some have been taken from the pool previously used at Edinburgh. Copies of the target pool are available on DVD from the first author upon request. Randomisation is achieved using the Visual Basic pseudo-random algorithm (rnd), having seeded it using the timer at the start of the program (RANDOMIZE TIMER). Once the “Start” button has been pressed, the computer first selects a target set, then selects one of the 4 clips within that set. The order of presentation of the four clips at judging is similarly randomised. All trials were run at the sender’s home (CR or SS) using standard desktop PCs and could be set to play through the night.

Materials

The Participant Information Form (PIF) is a 56-item measure that was constructed for general use with parapsychological research at the University of Northampton and includes questions concerning biographical and contact details (11-items); religious and parapsychological background (5 items); computer experience (2 items); practice of mental/physical disciplines (2 items); belief in luck (2 items); clumsiness and punctuality (2 items); competitiveness (1 item); absorption (2 items); sleep and dreams (4 items); imagination and fantasy-proneness (3 items); creativity (2 items); and physical and mental health (1 item). The remaining items relate specifically to knowledge, belief and experience of anomalous phenomena including telepathy, clairvoyance, precognition, psychokinesis, ‘communication with the dead’ and out of body experiences (19 items). The form concludes with questions about hypnagogic/hypnopompic experiences in a range of modalities (10 items) and an open question inviting descriptions of personal anomalous sleep-related experiences. Copies of all in-house measures are available from the first author on request.

Participants also completed the short extraversion and neuroticism subscales of the EPQ-R[2] (Eysenck, Eysenck, & Barrett, 1985). Each subscale has 24 items with a dichotomous yes/no response format. A belief in paranormal measure was also completed. This was adapted from Thalbourne and Delin’s (1993) 18-item Australian Sheep-Goat Scale, with an additional item asking about their performance in the

[2] An analysis of these personality variables will not form part of this paper

current study ('Do you believe that you might be able to demonstrate any psi ability in a controlled laboratory experiment?') and incorporating a 7-point Likert response scale.

Given the apparent importance of experimenter-participant interactions and expectations of success, at the end of the pre-judging briefing, the experimenters and participants completed a short Interaction Questionnaire[3]. This contained nine questions, concerning their personal feelings and expectations and perceptions of the quality of the interactions between experimenter and participants, which they were required to answer by giving ratings on 7-point scales.

1. How would you rate your current mood?
   (Negative-Positive)
2. How do you feel at this moment?
   (Tense - Relaxed)
3. How do you feel about the prospect of participating in this experiment?
   (Pessimistic-Optimistic)
4. How confident are you that today's experiment will be a success?
   (Not at all confident-Extremely confident)
5. How would you describe the quality of rapport that you have with the Experimenter?
   (Extremely poor-Extremely good)
6. How would you rate the quality of the interaction between experimenter and participants?
   (Very cold-Very warm)
   ('Rehearsed'-Spontaneous)
   (Very negative-Very positive)

Procedure

Once recruited for the experiment, participants were sent — either through the post or by email — the PIF, which records demographic information, as well as incorporating the belief in the paranormal questionnaire. Participants either returned the PIF by post or email ahead of their trial or brought it in with them on the day of judging. Along with the PIF, participants were all sent a hard-copy of a dream diary (copies of which are available on request). The dream diary contained instructions to clarify the procedure, information about confidentiality and the experimenter's contact information, as well as space to record the participants' dreams and their associations or comments on those dreams. They kept the dream diary for three nights; night 1 was a practice night and nights 2 and 3 were experimental nights.

On each night participants slept at home, as normal. Upon waking, either during the night or in the morning, they completed the appropriate section of their dream diary, writing down as much detail about their dreams as possible. There was space in the diary for participants to write any associations they may have identified between their waking lives and their dreams. Participants were also asked to indicate on which of the trial nights they believed there was a sender.

A sender (either Sherwood [SS] or Roe [CR]) was allocated to each participant on the basis of availability. Both senders remained blind as to participant identities until after the study was completed. On the evening of Night 2 (the first experimental night) the sender flipped a coin to determine whether Night 2 would be designated a telepathy or a clairvoyance trial. If Night 2 was a telepathy trial then by default Night 3 was a clairvoyance trial, and vice versa. The experimenter was not informed about which trial night was which until after the participants' judgments had been made and recorded. On both experimental nights the sender initiated the experimental software (for a description of the program see Roe, Sherwood, Luke & Farrell, 2002) at his own home, where a randomly-selected target clip was played from 2:00am until 6:30am. On the telepathy trial only, the sender watched the target clip between 6:00am

[3] Experimenters did not complete question 3.

and 6:30am[4] and attempted to communicate its content to the participant by ESP. The sender had no contact with the experimenter concerning the experiment until the information was needed about the target sets used for the trial nights.

After keeping the dream diary for three nights the participant travelled to the university campus to take part in the judging[5]. Participants were requested to attend judging as soon as possible, ideally the day after the last dream night so that dream content might still be retrievable from memory, but appointments were arranged at their convenience. On arrival they were met by the experimenter, who took them to a reception room where refreshments were available and engaged in an informal conversation incorporating a brief discussion of their experiences. After this discussion the participant was asked to complete a measure that asked them to rate the experimenter along a number of dimensions, such as warmth, spontaneity, and optimism (see Sherwood et al., 2004). The experimenter also completed brief ratings of confidence about the trial and his/her assessment of the interaction with the participant. These forms were placed in a sealed envelope and sent to an independent researcher (IB). Participants were assured that we were only interested in their honest impressions and that at no time would the experimenter be aware of the ratings they had given.

Next, the participant read out their dream diary content. The judging phase commenced with the experimenter accessing an SMS text message from the sender that identified the target sets for nights 2 and 3 (but not the identities of the target clips). The sender was shown, via a laptop computer, the four clips that made up the target set (consisting of the target clip and three decoys) for night 2, and these were rated and rank ordered for their degree of correspondence to the dream mentation for that night. This process was repeated for the target set and dream mentation for night 3. Once all judgements were recorded the experimenter contacted the sender via mobile phone to discover the identities of the two target clips and which night had been the sender night.

Once the series was completed, IB was provided with trial outcome data (but no personal information from participants) and analysed the relationships between these and the interaction data sent to him. The other members of the team only saw the results of analyses conducted by IB and were not at any stage provided with the raw data from the interaction measures.

PLANNED ANALYSES

The main planned analyses were to consider the following hypotheses

- Participant performance, in terms of z score of target rating, will be higher than chance expectation for each experimental night
- Participant performance in the actual sender condition will be higher than that in the no sender condition
- Participant performance in trials for which the participant believed there was a sender will be higher than for trials for which the participant believed there was not a sender[6]

Following Sherwood *et al.* (2005), we also planned to conduct exploratory analyses considering covariation of performance (using z-scores of target ratings) with experimenter interaction measures.

[4] The sending period was set at 30 minutes after initial pilot work suggested that it was difficult for senders to maintain their interest and focus on the clip over a longer time span. In this respect it is comparable with a typical sending period in a ganzfeld session. Although there is no guarantee that a sending period of 30 minutes will necessarily overlap with a receiver REM period, Braud (1977) has previously reported successful dream ESP. performance when sending between 6:00 and 6:30.

[5] On some trials, where access to the reception rooms was not possible, judging was conducted in the experimenter's own office or the participant's own home.

[6] We are grateful to an anonymous referee for suggesting that we consider differences in success between the two senders and we will include this analysis in our report.

RESULTS

To assess our prediction that participants would award a similarity rating to the target that was higher than the average rating for the three dummy clips for each experimental night, z scores were calculated (see Table 1). The overall mean z score for both nights was slightly positive (actual sender night mean z = 0.125, SD = 0.86; actual no sender night mean z = 0.16, SD = 0.91), indicating that the target clips tended to be awarded higher dream correspondence ratings than the other clips, but this did not differ significantly from zero (sender night one-sample $t(39)$ = 0.92, p=0.18, one-tailed, r= 0.146; no sender night one-sample $t(39)$ = 1.11, p= 0.14, one-tailed, r=0.175). Performance had a small effect size but was not significantly better than mean chance expectations and the hypothesis was therefore not supported.

TABLE 1: TARGET RANK FREQUENCIES AND Z-SCORE BASED UPON RATINGS FOR ACTUAL SENDER AND NO SENDER CONDITIONS (N = 40 IN EACH CASE)

	Rank				Similarity Rating	
	1	2	3	4	mean z	SD z
Sender trials	12 (30.0%)	11 (27.5%)	10 (25.0%)	7 (17.5%)	0.125	0.861
No sender trials	14 (35.0%)	7 (17.5%)	13 (32.5%)	6 (15.0%)	0.161	0.911

Contrary to expectations, the mean z-score for ratings was greater for the no sender trials compared to the sender trials, but a Wilcoxon Signed Ranks test found that the difference was not significant (z = -0.22, p= 0.41, one-tailed). Thus, having a sender did not help participants' performance; in fact, the slight trend showed the reverse.

As well as looking for gross differences between sender and no sender conditions we were able here to consider sender differences, since this study involved two senders who were quasi randomly allocated to participants and who contributed 20 trials each. Exploratory analysis of the results by the different senders are given in Table 2, and reveal an interesting but unexpected interaction effect: SS's participants performed as predicted, with greater success on sender nights compared with no sender nights, although this difference is not significant (Wilcoxon z = 1.23, p=0.218, two-tailed, r=.275); however, the reverse was true for CR's participants, with better performance on no sender nights compared with sender nights, to a degree that was suggestive (Wilcoxon z = -1.66, p=0.097, two-tailed, r = -.371). The difference between these effect sizes approaches significance (Z=1.953, p=.051, two-tailed). Thus, whether or not having a sender try to send the target is advantageous may depend on who the sender is. This full interaction trend, which could explain the lack of an overall sender effect is further illustrated in Figure 1.

TABLE 2: TARGET RANK FREQUENCIES AND Z-SCORE BASED UPON RATINGS FOR ACTUAL SENDER AND NO SENDER CONDITIONS (N = 20 IN ALL CASES)

	Rank				Similarity Rating	
	1	2	3	4	mean z	SD z
CR						
Sender	5 (25.0%)	5 (25.0%)	5 (25.0%)	5 (25.0%)	- 0.044	0.912
No sender	9 (45.0%)	4 (20.0%)	5 (25.0%)	2 (10.0%)	0.319	0.905
SS						
Sender	7 (35.0%)	6 (30.0%)	5 (25.0%)	2 (10.0%)	0.295	0.794
No sender	5 (25.0%)	3 (15.0%)	8 (40.0%)	4 (20.0%)	0.002	0.833

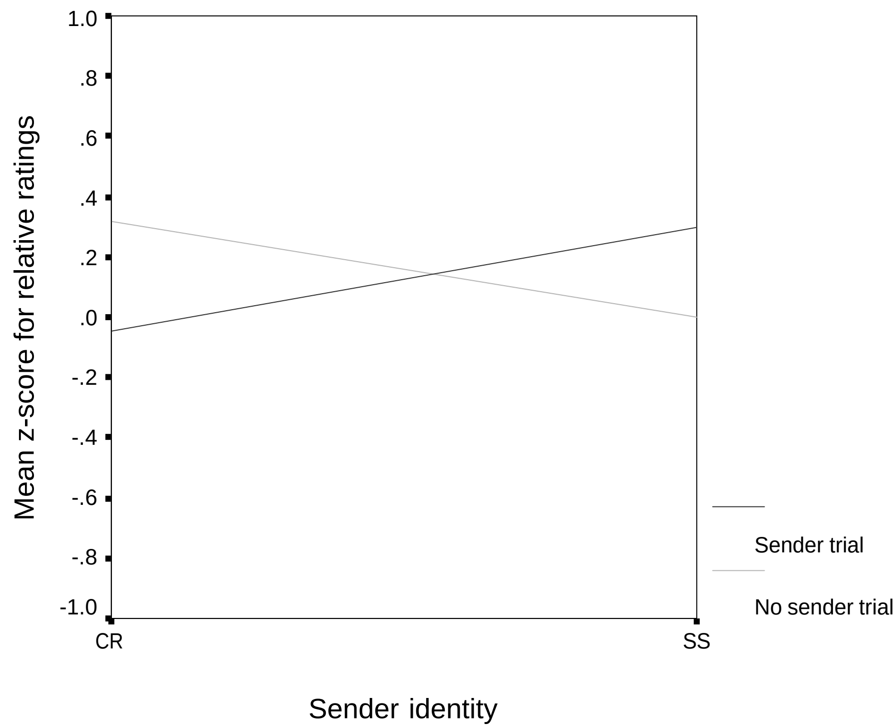

Figure 1. Mean z-scores based upon ratings for actual sender and no sender conditions according to sender

We also planned to consider the effects of participants' expectancy that a sender was operating upon their performance, and participants were asked to nominate on which night they believed there to be a sender and which night not (of course, they were blind to actual sender status). Participants correctly identified the order of sender and no-sender conditions for their trial on just 18 of the 40 trials, which is slightly less than chance expectation of 20 and suggests that participants could not accurately identify the sender condition. This allows us to consider the effects of expectancy separately from actual condition, since the two variables are unrelated. A summary of participant performance on nights when they believed there was a sender operating compared with nights when they believed there was no sender are given in Table 3. Contrary to expectations, the mean z-score for ratings was slightly greater for the trials when the participants did not expect a sender compared to the trials when they did expect a sender, irrespective of whether their expectations were correct, although a Wilcoxon Signed Ranks test found that this difference was not statistically significant (z =-0.18, p=0.46, one-tailed). Thus, expecting the involvement of a sender did not affect performance in the dream ESP task.

TABLE 3: TARGET RANK FREQUENCIES AND Z-SCORE BASED UPON RATINGS FOR EXPECTED SENDER AND NO SENDER CONDITIONS (N = 20 IN ALL CASES)

	Rank				Similarity Rating	
	1	2	3	4	mean z	SD z
Expected Sender	12 (30.0%)	9 (22.5%)	13 (32.5%)	6 (15.0%)	0.127	0.915
Expected No sender	14 (35.0%)	9 (22.5%)	10 (25.0%)	7 (17.5%)	0.159	0.858

We also conducted a combined analysis that looked for possible interactions between actual sender status and participant expectation that there would be a sender. These data are summarised in Table 4, and show that in terms of ranks the best performance occurred with no sender trials in which the participant believed there would be no sender and worst performance is for sender trials where participants believed there would be a sender, which is a reversal of expectation, although this difference (based on similarity ratings) is not significant (Wilcoxon z =-.240, p=0.811, two-tailed).[7] Where participants wrongly identified sender and no sender conditions there is no difference whatever in performance between the two trials (Wilcoxon z=0.00, p=1.00, two-tailed). Taken together, these results give little indication of any sender or sender expectancy effect in this study; indeed, based on the planned outcome measure of *Z* scores, these results do not give evidence of ESP at all (despite the percentage hit rates being reasonably consistent with others' ganzfeld findings).

TABLE 4: TARGET RANK FREQUENCIES AND Z-SCORE BASED UPON RATINGS FOR ACTUAL SENDER AND NO SENDER CONDITIONS SEPARATED BY PARTICIPANT EXPECTANCY OF SENDER STATUS

	Rank				Similarity Rating	
	1	2	3	4	mean z	SD z
Sender expected						
Sender present (N = 18)	5 (28.0%)	4 (22.0%)	6 (33.0%)	3 (17.0%)	.053	.927
No sender present (N = 22)	7 (32.0%)	5 (23.0%)	7 (32.0%)	3 (14.0%)	.187	.922
No sender expected						
Sender present (N = 22)	7 (32.0%)	7 (32.0%)	4 (18.0%)	4 (18.0%)	.184	.821
No sender present (N = 18)	7 (39.0%)	2 (11.0%)	6 (33.0%)	3 (17.0%)	.128	.924

[7] An omnibus test of these data would not be appropriate given their non-independence (all participants contribute to two of the 2x2 cells)

TABLE 5: SPEARMAN CORRELATION CO-EFFICIENTS FOR Z-SCORE EXPERIMENT RESULTS FOR THE SENDER AND NO-SENDER CONDITIONS CORRELATED AGAINST THE SENDER AND EXPERIMENTER QUESTIONNAIRE RATINGS. THE CO-EFFICIENTS ARE SHOWN FOR THE OVERALL RESULTS, AND ALSO BROKEN DOWN BY EXPERIMENTER.

Questions		*Experimenter*					
		Overall (n = 40)		Louie Savva (n = 26)		Louise Farrell (n = 14)	
		Sender	No Sender	Sender	No Sender	Sender	No Sender
Participant	Mood	-.03	.08	-.13	-.14	.08	**.64***
	Feeling	-.14	-.14	-.27	-.11	-.46	-.14
	Optimism	.23	.18	.20	.10	.22	.28
	Confidence	-.09	-.09	-.04	-.07	-.52	-.15
	Rapport	-.07	-.03	-.03	.07	.00	-.13
	Warmth	-.05	-.04	.00	.08	-.18	-.16
	Spontaneity	.08†	-.13†	.02‡	-.14‡	.05#	-.01#
	Positiveness	.11†	.02†	.15‡	.11‡	-.04#	.02#
Experimenter	Mood	**-.34***	.22	-.28	.04	-.12	**.62***
	Feeling	-.07	-.05	-.08	.10	.14	-.11
	Rapport	-.11	.20	-.21	.27	-.08	.09
	Confidence	-.11	.05	.13	-.10	-.50	.26
	Warmth	.04	.16	-.09	.36	.16	-.23
	Spontaneity	.04	.15	-.06	.31	.31	-.09
	Positiveness	-.10	.23	-.10	.34	-.04	.11

* p < .03 (2-tailed). † n = 38 due to missing values. ‡ n = 25 due to missing values. # n = 13 due to missing values.

Finally we conducted exploratory analyses to see whether performance covaried with measures of the quality of interaction between experimenter and participant. Spearman rank order correlations between the different questionnaire ratings and the experimental results are summarised in Table 5, and include separate analyses for each experimenter. Generally, there is little indication from these that performance at the dream ESP task can be predicted by scores on interaction measures, with only 3 of 90 correlations achieving significance. Although all of these were associated with experimenter or participant mood, the effects seem to be reversed for sender and no sender trials, making interpretation difficult; since the analyses have not been corrected for multiple analyses they may simply reflect random noise and would need to be replicated in future work before they should be interpreted as a real effect. Some other associations generated relatively large coefficients, particularly with confidence, although this is in the opposite direction to prediction. There do seem to be some differences between experimenters, which perhaps reflect their different personalities and interaction styles.

DISCUSSION

Although hit rates of 30% and 35% over two sets of 40 dream ESP trial nights is somewhat above the mean chance expectation of 25%, and represents an improvement on the overall hit rate of 21.1% from our previous study that used ganzfeld stimulation, deviations from chance expectation based on z scores of similarity ratings were not sufficient to give statistical significance (respectively, mean z = 0.125, t(39) =

0.92, p=0.18, one-tailed; mean z =0.16, $t(39)$ = 1.11, p=0.14, one-tailed), and so we are unable to reject the null hypothesis. Of course, we may not expect to see evidence of psi in any summary measure since this study included conditions that were hypothesised to depress any psi performance, although we did not confirm our prediction that participants would perform better on sender trials than on no-sender trials. This failure to capture any sender effect is consistent with Sherwood and Roe's (2003) finding that Maimonides dream ESP studies that had investigated clairvoyance had in fact been more successful than those ostensibly investigating telepathy — despite the researchers themselves advocating the involvement of an agent (e.g., Ullman et al., 1973) — and with Sherwood et al.'s (2005) failure to find a sender effect in earlier ganzfeld work. One might speculate, then, that it may be desirable to concentrate on clairvoyance designs in future research, given the advantages this would offer in recruitment (since participants could be scheduled one at a time instead of having to co-ordinate across two people) and in security (with sensory leakage and cheating made less likely when no-one needs to be aware of the target until after judging is completed), and apparently minimal disadvantages in terms of impact upon effect sizes.

One form in which senders might play a role without being essential to any psi process is if they make the task seem inherently more plausible or help diffuse responsibility for any psi that occurs (see Roe et al., 2004 for a fuller discussion), and indeed Roe et al. did report a sender expectancy effect, whereby participants performed better when they believed that a sender was involved compared with when they believed there was no sender (hit rates of 33.3% and 18.2% respectively), irrespective of actual sender status. In this study there was no indication of any sender expectancy effect, with better performance actually occurring where participants believed there was no sender. This may not be a legitimate comparison, however, since in Roe et al.'s (2004) study participant expectancy was manipulated by giving either true or false information at the beginning of the session, whereas in this study participants decided retrospectively for themselves, typically by reflecting on their dream mentation, whether a trial involved a sender. In this latter case, then, participants might have no particular expectancy as to whether or not the first trial will involve a sender, since at that point they have no material on which to base their judgement, and it may be that any expectancy effect would only be expressed on the second trial night (although this too may be problematic, since some participants in the current study only made their judgements after completing both nights)[8].

In any case, any potential advantages of involving a sender may have been undermined here by our decision on security grounds to keep the senders and participants isolated from one another to the extent that senders and participants were given no information whatever about one another. Several of the participants recruited and run by LF expressed doubt that telepathy would be possible under circumstances in which the people involved had never established any rapport, indeed had never met each other or even knew each other's names. Likewise the senders found it a handicap to have no shared experiences or knowledge about the participant on which to base their sending strategy. On reflection, this security measure seems Draconian, and in future studies greater effort would be needed to ensure that some degree of rapport is possible, for example by adopting aspects of the methodology used in remote healing studies (e.g., Sicher, Targ, Moore & Smith, 1998).

Analysis of participant-experimenter interaction data did not reveal any strong trends, and given the scope for committing Type I errors, no confident claims are made from these results. If taken at face value, the best predictors seem to be participant and experimenter mood, although these only emerge in some conditions and not others, and do not confirm our earlier finding of a negative relationship between outcome and receiver mood (Sherwood et al., 2005). Previous promising findings with optimism and confidence of success were not confirmed here. It may be unrealistic to expect experimenter-participant interaction findings to replicate across studies given that the participants (and experimenters in this case) are different, and efforts need to be made to ensure continuity across studies. In any case, in the present study there may have been limited opportunity for experimenter interaction effects to occur. With the

[8] We are grateful to one of our referees for suggesting that it would be useful in future studies to have participants rate the confidence they have in their estimates.

switch from a ganzfeld to a dream ESP design most of the recruitment and running of the study was conducted by telephone, email and by post, so that there was a large reduction in the amount of face-to-face interaction until the judging session, by which time any psi performance is likely to be over (unless it occurs during judging). There might, therefore, have been little opportunity for the interaction to affect performance unless it could act retrospectively. Future tests of interaction effects would need to ensure that there is sufficient interaction between the parties so as to provide an opportunity for this to impact upon performance.

REFERENCES

Beloff, J. (1983). The repeatability problem in parapsychology. *Parapsychology Review*, *14*, 1-4.

Braud, W. (1977). Long-distance dream and presleep telepathy, In J. D. Morris, W. G. Roll, & R. L. Morris (Eds.), *Research in Parapsychology 1976*, pp.154-55. Metuchen, NJ: Scarecrow Press.

Dalton, K., Steinkamp, F., & Sherwood, S. J. (1999), A dream GESP experiment using dynamic targets and consensus vote. *Journal of the American Society for Psychical Research*, *93*, 145-66.

Eysenck, S. B. G., Eysenck, H. J., & Barrett, P. (1985). A revised version of the Psychoticism scale. *Personality and Individual Differences*, *6*, 21-29.

Milton, J., & Wiseman, R. (1999). Does psi exist? Lack of replication of an anomalous process of information transfer. *Psychological Bulletin*, *125*, 387-391.

Roe, C. A., Sherwood, S. J., & Holt, N. (2004). Interpersonal psi: Exploring the role of the sender in ganzfeld ESP tasks. *Journal of Parapsychology*, *68*, 361-380.

Roe, C. A., Sherwood, S. J., Luke, D. P., & Farrell, L. M. (2002). An exploratory investigation of dream GESP using consensus judging and dynamic targets. *Journal of the Society for Psychical Research*, *66*, 225-238.

Shapin, B. & Coly, L. (1985). *The repeatability problem in parapsychology*. New York, NY: Parapsychology Foundation.

Sherwood, S. J., & Roe, C. A. (2003). A review of dream ESP studies conducted since the Maimonides dream ESP programme. *Journal of Consciousness Studies*, *10*, 85-109.

Sherwood, S. J., Roe, C. A., Holt, N., & Wilson, S. (2005). Interpersonal psi: Exploring the role of the experimenter and the experimental climate in a ganzfeld telepathy task. *European Journal of Parapsychology*, *20*, 150-172.

Sicher, F., Targ, E., Moore, D. & Smith, H. (1998). A randomised double-blind study of the effects of distant healing in a population with AIDS. *Western Journal of Medicine 169*, 356-63.

Stanford, R. G. (1993). Learning to lure the rabbit: Charles Honorton's process-relevant research. In R. K. Rao (Ed.), *Charles Honorton and the impoverished state of scepticism*. (pp. 129-176). Jefferson, NC: McFarland & Co.

Thalbourne, M. A., & Delin, P. S. (1993). A new instrument for measuring the sheep-goat variable: Its psychometric properties and factor structure. *Journal of the Society for Psychical Research*, *59*, 172-186.

Ullman, M., & Krippner, S., & Vaughan, A. (1973). *Dream telepathy: Experiments in nocturnal ESP*. Jefferson, NC: McFarland & Co.

Utts, J. (1991). Replication and meta-analysis in parapsychology. *Statistical Science*, *6*, 363-403

A MEDICAL-PSYCHOLOGICAL APPROACH TO THE POSSESSION CASE BEHIND WILLIAM BLATTY'S THE EXORCIST[1]

Sergio Antonio Rueda MS[2]D

Instituto de Medicina y Tecnología Avanzada de la Conducta

Cd. Juárez, Chihuahua Mexico

ABSTRACT

The Exorcist, often considered the seminal horror film in the history of movie making, caused tidal waves of publicity and public reaction (sometimes reactions so severe by the terror evoked by the film that in some cases psychiatric treatment, for some who viewed the film in 1973, was needed[3]). The original case on which *The Exorcist* book and movie were based took place in Mount Rainier near Washington D.C. in 1949 and was examined closely by J.B. Rhine. *The Exorcist* is a distorted and exaggerated version of the original case. A recent investigation of the Mount Rainier Case by this author reveals some new information suggesting that the authors of previous works may have be too eager to present the case as one of demonic possession. I examine four hypotheses: medical, psychological, and associated natural causes; fraud; poltergeist activity; and demonic possession. I present new information that has been obtained through personal interviews with witnesses of the original Mount Rainier case, unpublished material on the case such as personal correspondence, and information of private documents which has never been released in the past. The conclusion of my investigation was that the case can be most parsimoniously addressed from the medical-psychological perspective, and secondarily from a parapsychological point of view, with the additional possibility of deception. In my opinion, the case presents evidence for a conversion disorder combined with actual poltergeist manifestations.

HISTORICAL INTRODUCTION

St. Peter's terrifying portrait of hell has survived through millennia of Christian history. The fire-and-brimstone pronouncements of modern evangelical preachers derived their power from this ageless vision. Almost as fearsome as eternal damnation is the threat of demonic possession by an evil spirit during one's lifetime. Possession of an individual by spirits, demons, or other alien entities has often been claimed by willing and unwilling victims, by both hostile and benevolent spirits. In one form or another, spirit possession has been reported in nearly every region of the world. A 1973 scientific survey of 488 societies found that most of them routinely practice "altered states of consciousness"; half of these societies attribute this "alteration" to spirit possession in at least some instances (McManus, 1987)

The Christian faith has had its share of fearsome possessions since the Old Testament's King Saul reportedly endured seizures caused by an evil spirit. Many forms of physical and mental illness have been attributed to hateful demons. Fourteenth and fifteenth century Europeans recorded hundreds of supposed cases of demonic possession and exhaustively catalogued their symptoms. The face of the possessed was said to warp into the features of the devil. The body grew thin and the stomach bloated; vomiting was common, as

[2] I wish to thank the Parapsychology Foundation for the grant obtained to study this case. Also, I wish to thanks Carlos Alvarado, Nancy Zingrone, and Stanley Krippner for editorial assistance and Richard Broughton for his valuable guidance in contacting people who contributed valuable material for the interviews in this case.

[3] Some psychiatrists even coined the term "cinematic neurosis" to refer to the terror produced by the film for those who left the film, after viewing it, with the feeling and sensation of terror (Bozzuto, 1975, Burke, 1977, Taylor, 1975)

was internal pain "like animals an eating the entrails". The possessed suffered from convulsions, bellowed obscenities in unnaturally deep voices, and projected a freezing cold aura (McManus, 1987).

If possession is a venerable tradition in Christianity, so too is its cure, namely exorcism. Throughout early Christianity the ability of a devout follower, ordained or otherwise, to perform exorcism was a sign of God's grace. Jesus exorcised demons, and the clothes of the apostles were draped on the possessed and diseased to rid them of evil spirits. In today's Roman Catholic Church, however, the rites of exorcism are no longer part of the basic curriculum for would-be priests; only those who take special instruction may conduct an exorcism.

In Roman Catholic exorcisms the cosmic struggle between good and evil is played out between the priest and the evil spirit on the battleground of the possessed. As the demon fights to stay in its victim, the priest invokes the name of Jesus to drive it out. There have been many celebrated cases of exorcism over the centuries, most of them centered in Europe. One of the best known, the 1976 case of Annelise Michell, of Bavaria, ended in her tragic death. However, there are also cases from other continents, although these have occurred in the context of other cultural and philosophical frameworks. In the latter part of the 20th century, the number of Christian exorcisms in the United States exceeded those in Europe (McManus, 1987). Scholars in psychical research and parapsychology, such as Balducci and Gauld, documented many of the European cases, and attempted to distinguish so called "possession" cases from so-called "haunting" cases. Rogo wrote about the role played by so-called "poltergeist" phenomena in possession cases. Hence, the overlap between possession cases and parapsychological phenomena represents the current status of the field (Gauld & Cornell, 1979; Rogo, 1978).

OVERVIEW OF THE CASE

The 1949 case on which William Blatty based most of his celebrated novel took place in Mount Rainier, in Princes George County near Washington D.C. The first reports on the case were of a presumptively poltergeist nature and were reported by the family to a Lutheran minister, the Reverend Luther Miles, who the family had asked for help in order to free the boy from what they considered to be spirit possession. The Williams family was composed of the maternal grandmother, the father, the mother, and the 14-year-old adolescent Ronald Doe, who attended a local secondary school in Mount Rainier. An "entity" reportedly invaded the boy after he began experimenting with an Ouija board, a practice possibly instigated by his aunt Dorothy, who took a lively interest in spiritualism and the occult.

The initial phenomena took place on June 15, 1949 at the home of Ronald. A dripping noise was heard by Ronald and his grandmother Dorothy. The aforementioned noise continued for a short time and then the picture of Christ on the wall shook as if the wall had been bumped.

The aforementioned phenomenon, alongside other phenomena such as furniture moving, and objects and other kitchen appliances being thrown on the air with no apparent agent or force behind them, were reported to the Lutheran minister, who took the boy to his premises few days later. At his apartment, he also witnessed similar phenomena on the night of February 17[4], phenomena that included a heavy armchair moving with the boy on it (with his hands apparently standing still). Also, marks reportedly appeared on the boy's body for about four successive nights, while at home. The marks looked like scratches on the body being made by claws, which indicated the word "St Louis", a location where his preferred aunt lived.

After some of the aforementioned phenomena, the family consulted Father Albert Hughes of the St. James Catholic parish in Mount Rainier who suggested the family initiate the use of blessed candles, holy water, and special prayers. These practices did not succeed in liberating the boy from the anomalous forces which apparently afflicted him. Hence, the phenomena continued. Then, the Rev. Schulze suggested that the boy be taken to the Mental Hygiene Clinic of the University of Maryland, where he underwent medical and psychological evaluation. Nevertheless, nothing pathological was found regarding the mental and physical condition of the boy. Furthermore, reports at the time only indicated that he was

[4] I have used pseudonyms for all members of the family in order to protect their identity.

suffering from rashes that resembled those manifested by patients during some somatic reaction disorders under certain stressful situations.

Then the family decided to move to St Louis, Missouri, where Ronald was taken to the Alexian Brothers hospital, where he underwent an exorcism, one which had been authorized by Archbishop Joseph Ritther. He had given Fathers Bowder and Bishop his permission to begin the formal rite of exorcism after extensive medical and neurological evaluation. The exorcism began in St Louis, and Father Bowder prepared for it by means of a fast. At the onset of the exorcism, after Father Bowder had commanded the demon to identify itself and declare its time of departure, Ronald winced and rolled in a sudden seizure of pain. In a two-hour period, the boy manifested skin marks that looked as if he had been branded some 30 times. The ritual of exorcism lasted for over 40 days and then Father Bowder declared that Ronald was free from the demons that had purportedly possessed him.

In 1949, an apparent “diary” of the Ronald Doe case was discovered by Father Eugene Gallagher, who was on the faculty of Georgetown University. At the time, the author William Blatty sat in Father’s Gallagher’s class during a discussion of the case. Through Father Gallagher, the diary was read by Blatty, who later contemplated fictionalizing the story.

In the late 1980s, a copy of the diary also fell in the hands of Thomas Allen (1993), a popular writer who wrote a book about the story. Moreover, some letters related to the case, in which J.B. Rhine was involved, came into my possession and I began an investigation of the case with a grant obtained from the Parapsychology Foundation of New York. This investigation took several years, while I was a visiting scholar at the Foundation for Research on the Nature of Man in Durham, N.C. My investigation led to the discovery of some key witnesses who had participated in the Mount Rainier case. These witnesses were still alive and provided very important information that has led to my medical-psychological evaluation of this famous case.[5]

J.B. RHINE AND THE MOUNT RAINER CASE

In 1949, J.B. Rhine received a letter[6] from the Reverend Luther Miles Schulze, a minister from a small Lutheran parish in Washington D.C. The letter was an invitation for Rhine to investigate a poltergeist case, which had taken place in Mount Rainier, Princes George County near Washington D.C. A few months later, J. B. Rhine, accompanied by Louisa Rhine, visited the premises of the Reverend Schulze to investigate the case. Regarding this case, J.B. Rhine was quoted as having declared that it was "The most impressive poltergeist phenomena that has come to my attention" (Rhine, 1949).[7]

The Reverend was somehow skeptical about the case as they were originally related to him “by the family” and so he took a guarded position surmising that the phenomena were “a figment of the superstitious imagination of the family” (Nicola, 1974) However, to his surprise Schulze witnessed phenomena that shook his belief system and, as a result, he abandoned his skepticism.

In a follow-up statement on the case, J. B. Rhine, wrote a letter taking a guarded view of the case, which appeared to him to be “a conventional poltergeist case”. Rhine recommended that Schulze should further investigate the case in order to rule out any possible natural causes that could have had explained the phenomena.[8]

On August 20, 1949, the *Washington Post* published an article by Bill Brinkley entitled: "Priest Frees Mount Rainer Boy Held in Devils Grip". The newspaper article related the story of a Catholic priest who had successfully exorcized the demon in an authentic Roman Catholic ritual for a 14-year-old boy, one who lived in Mount Rainier in Prince George County. Part of the clip related:

---

[5] It is important to note that the sources of these letters, copies of which are in my possession, cannot be included in this report, due to a contract with a prospective publisher.
[6] Letter of the Reverend Schulze to J.B. Rhine, March 21 1949
[7] This citation, quoting J.R. Rhine on the case, was included by Denis Brian in his book: *The Enchanted Voyager*, a biography of J.B. Rhine. However, it was originally made by a reporter from the *Washington Post*, as reported in the edition of August 20, 1949. However, in a later letter, J.B. Rhine declined having made such a statement.
[8] Letter of J.B. Rhine to the Reverend Schulze, April 2 1949

> In what is perhaps one of the most remarkable experiences of its kind in church history, a 14-year-old Mount Rainier boy has been freed by a Catholic priest of possession by the Devil, Catholic sources reported yesterday. Only after 20 to 30 performances of the ancient ritual here and in St. Louis, was the Devil finally cast out of the boy, it was said. In all except the last of these, the boy broke into a violent tantrum of screaming, cursing, and voicing of Latin phrases--a language he had never studied--whenever the priest reached those climatic points of the 27-page ritual in which he commanded the demon to depart from the boy. (p. 1A).

Some three decades have passed since *The Exorcist*, as a film, was released for the first time in 1973. Nevertheless, the film still reverberates in the minds of many who viewed the film earlier. Moreover, the impact among the general public and some other academic circles has been so strong that, up to the present time, several major television channels such as the Discovery Channel as well as various publishers have continued to exploit the case, which has become part of the cultural memorabilia, including a new release on digital format of the original movie, i.e., *The Exorcist. Director's Cut'*. Also, subsequent versions of the sequelae such as *The Exorcist: The Beginning* have appeared. Moreover, Thomas Allen (1973) published the book *Possessed*, which (as mentioned earlier) is an account of the original case based in a diary found in the Alexian Brothers' Hospital in Saint Louis, one of the places in which one of the exorcisms took place. In addition, there was a documentary produced by Hennenger Media for Discovery Channel called *In the Grip of Evil*[9], which recounts the original case.

THE EXORCIST AND THE 1949 MOUNT RAINIER EXORCISM CASE

Blatty drew from other historical cases of demonic possession and exorcism when writing and recreating his best-selling novel and later contributed to the acclaimed film. Nevertheless, he had in mind the case of the 14-year-old boy, at Mount Rainier, who purportedly became possessed after experimenting with the Ouija board. In fictionalizing the Mount Rainier case in his novel, Blatty presents a 12-year-old girl instead of a boy to hide his identity. The 12-year-old girl, named Regan, was played by Linda Blair, who, in the film, was possessed by an evil spirit and performed incredible feats of body movement and physical strength, including levitation of objects in the room, and on occasions squirting light green vomit toward people around her. Marks appeared spontaneously on her body and she was able to turn her head completely backwards. She cursed people around her and at one point masturbated with a crucifix and thrust her mother's face into her blood-filled crutch (Blatty, 1973). Coprolalia was reported in the original case as well as depicted in the film and described in the novel.

Most of the aforementioned physical feats and paranormal phenomena performed by the girl, however, were incorporated by Blatty to elaborate upon the original story, which was much less dramatic. This made it appear to be a genuine case of demonic possession to meet the standards established by the Roman Catholic Ritual to determine demonic possession.

Many viewers of the film wondered to what extent the novel and the film *The Exorcist* were based in the original Mount Rainier case. According to Nicola (1974), an expert in demonic possession and a consultant to the film, both are fairly close to the reported events and, although *The Exorcist* was a dramatization, about 80% percent of the contents reflected reported aspects of the Mount Rainier case. However, these remarks may have been self-serving because of Nicola's connection with the film.

Furthermore, many people, since the film was released in 1974, have been speculating with regard to the sources of information used by Blatty on the making of the novel and the later film, and the veridical events behind them. Up to the present time, only partial information on the Mount Rainier case was known and leaked to the public, mostly through the popular press (Gunther, 1975). Also, additional information on the case was provided by Blatty himself in his subsequent book, *I'll Tell Them I Remember You* (Blatty, 1999) Moreover, partial information on the case has been published in books and

[9] The author was invited by Henninger Media, which produced the documentary in the Grip of Evil for Discovery Channel, as an expert on the Mount Rainier Case or the parapsychological area of the documentary in 1997. *In the Grip of Evil* is a 60-minute documentary that explores the issue of exorcism and demonic possession and its meaning.

technical articles on parapsychology, such as Nicola's (1975) *Diabolical Possession and Exorcism*. Most of the known details come almost entirely from the partial information provided by the aforementioned sources and from the film story.

Furthermore, ever since the Mount Rainier case took place in 1949, the Catholic Church has been reluctant to reveal any information on the case and has kept the exorcism secret to protect the identities of the participants. Attempts to obtain the original church reports on the case have been futile.

More recently, however, new details about the Mount Rainier case have come to light. For instance, a copy of a diary about one of the exorcisms which took place in St Louis,[10] kept by one of the priests during the exorcism, fell in the hands of a writer, who has recently published a more complete account of the case (Allen, 1993). According to Allen, the diary, which inexplicably remained in a locked room of the Alexian Brothers Hospital in St. Louis, was found by a worker in a drawer of a table, after a constructor ordained the building be torn down.

The diary used by Allen in his 1993 book *Possessed*, as well as some recent interviews that I conducted in 1991 and 1993 with some of the participants and witnesses of the 1949 Mount Rainier exorcism, provide a more complete picture not only of the actual story behind Blatty's *Exorcist*, but also regarding details of the psychological dynamics of the participants involved and the putative paranormal phenomena surrounding it. This additional information presents the world with more details from which to evaluate the case in both medical-psychological and parapsychological perspectives.

THE 1949 MOUNT RAINIER EXORCISM

As mentioned earlier, the news about the Mount Rainier case reached J.B. Rhine and Louisa Rhine through a Lutheran minister to whom the family of the boy had appealed for help. In a letter addressed to Rhine in March 21, 1949. Schulze stated[11]:

> We have in our congregation a family who are being disturbed by poltergeist phenomena. It first appeared about January 15, 1949. The family consists of the maternal grandmother, a fourteen-year-old boy, who is an only child, and his parents. The phenomena are apparent only in the boy's presence. I had him in my home on the night of February 17-18 to observe him myself. Chairs moved with him and one threw him out. His bed moved whenever he was in it. When he was in bed with me, mine vibrated. There was no apparent motion of his body. I then made a bed on the floor for him and this bed glided over the floor....Would you or someone from your staff, be interested in studying this case?...The family mentioned other such phenomena as chairs moving, tables overturning, objects flying through the air, and scratching and drumming. Their floors are scarred from the sliding of heavy furniture.

In reply to Schulze's request for help, Rhine informed Schulze, via another letter, that he was deeply interested the case and that he was going through Washington D.C. several times that spring and that he would stop off in the area if he knew he would be of any help. In the meantime, he offered Schulze a preliminary explanation of the possible causes, including fraud, of the phenomena the minister had described in his letter. In Rhine's reply[12], he stated:

> As you know, the most likely normal explanation is that the boy is, himself, led to create the effect of being the victim of a mysterious agencies or forces and he might be sincerely convinced of it. Such movements as those of the chair and the bed might, from your very brief account of them, have originated within himself. Presumably, however, the movement of the bed on the floor was not of that type. I presume you observed the movement in good light and were not relying in his account of it.

[10] Two main exorcisms took place in the case, according to the story (Allen, 1993)

[11] Letter of Schulze to Rhine, March 21 1949.

[12] Letter of J.B. Rhine to Schulze, April 2, 1949.

Later the Rhines personally traveled to Washington D.C. to investigate the case and examined the minister's room, where Ronald had spent the night with the Reverend Schulze and where the latter had witnessed the phenomena that he was unable to explain. According to Schulze, the initial phenomena of the case took place at the boy's family house located at 3210 Bunker Hill Road.

PROPOSED METHODOLOGY TO INVESTIGATE AND DIAGNOSE THE CASE

In my evaluation of the Mount Rainier case, I used a method that emphasized the principle of parsimony, or scientific economy (sometimes also referred to as Occam's Razor). This principle holds that when a natural and ordinary explanation is possible, one does not have to posit unusual and extraordinary causes (William, 1915), even though the potentiality and the possibility are always there. Applying this principle to our examination of the Mount Rainier case, it means one must reject any unusual or extraordinary explanation if an ordinary one is adequate. One needs to consider fraud and deception, natural causes (physical, medical, and/or psychological), parapsychological causes, as well as demonic agency. Nevertheless, in the paper I have focused on the medical-psychological dimension and have given some brief consideration to poltergeist phenomena as well as to fraud.

MEDICAL-PSYCHOLOGICAL CONSIDERATIONS

Regarding the marks that spontaneously branded the boy's body, it is important to note that there is a disorder known as "conversion disorder" (American Psychiatric Association-DSM-IV, 1994) that may have caused the marks (although one cannot easily explain the actual mechanism for such phenomena). According to the DSM-IV:

> Traditionally, the term conversion derives from the hypothesis that the individual's somatic symptoms represent a symbolic resolution of an unconscious psychological conflict, reducing anxiety and serving to keep the conflict out of awareness ("primary gain"). The individual may also derive "secondary gain" form the conversion symptoms--that is, external benefits are obtained or noxious duties and responsibilities are evaded. (p. 453)

In support of the aforementioned diagnostic criteria established by the *DSM-IV*, the 14- year-old adolescent was undergoing serious psychological turmoil and conflict as a result of his unhappiness with attending school, where he was having conflict with other students. Moreover, he was facing a conflictive situation with his mother, who ignored his problems at school, and was also pressuring him to attend classes regularly. Therefore, this conflict may have been causing him to experience considerable distress. Moreover, this stress, in turn, may have resulted in a psychosomatic disorder, which probably affected his skin, a rash reaction due to an emotional response. It is important to note that a connection between an emotional stimulus and certain specific skin problems has been established. As pointed out by Lachman (1972):

> A number of common reactions to emotional stimulus have been specified. These include...reddening or flushing of the skin surface... [such as] a pattern of roughness in the skin consisting of multiple swellings and protuberances... (p. 17).

Lachman adds that the psychogenic nature of various skin disorders, such as rashes.

> may break out in emotion situations or in response to frustration.

Among the aforementioned psychological conditions that may create such skin reactions is "conversion disorder" or what used to be called "hysteria". According to a dermatologist consulted on the case (Alvarez, 2006)[13], "in some cases of conversion reactions the skin becomes so sensitive that fingernails lightly drawn

[13] Manuel Alvarez, a dermatologist in private practice in Mexico City, was consulted in the case.

over its surface immediately raise red welts" (that Ronald[14] was suffering from a skin disorder caused by the deep stress he was undergoing is confirmed by Schulze's report, which indicates that when Schulze and his personal physician saw the alleged "St. Louis marks" on the boy's body; they "looked more like those caused by nerve reactions"[15]). We can speculate that as a result of the stress he was experiencing, his skin had become so sensitive that an object lightly drawn on the surface could create marks. If the diagnosis of conversion disorder is correct in the case of Ronald, his psychological condition would have had to meet the criteria established by the DSM-IV for this disorder. The main feature of this somatoform disorder is an alteration or loss of physical functioning that suggests a physical disorder, but that instead is apparently an expression of a psychological conflict or need. Conversion disorder (once called "hysteria") is a neurotic disturbance. Typical symptoms include a loss or alteration of a sensory or motor functioning (deafness, blindness, or paralysis) (DSM-IV, 1994). The condition, according to Lachman (1972), is usually temporary and the symptoms appear to resolve a problem for the individual, at least temporarily (p. 15).

For instance, explains Lachman, an individual may develop a conversion reaction of blindness to resign from a particular job or to avoid an unpleasant situation. The symptoms relate to the motives and conflicts of the persons who display them. (Lachman, 1972). The classic symptoms of the disorder, according to the DSM-IV, are those that suggest neurological disease such as paralysis, aphoria, seizures, akinesia, dyskinesia, blindness, etc. Two mechanisms have been suggested by the DSM-IV to explain what the person derives from having symptoms of conversion disorder. In the first mechanism, the person achieves "primary gain" by keeping an internal conflict or need out of awareness. In such cases there is a temporal relationship between an environmental stimulus that is apparently related to a psychological conflict or need and initiation or exacerbation of the symptom. For example, after an argument, inner conflict about the expression of rage may be expressed as "aphoria" or as "paralysis" of the arm; in such cases the symptom, has a symbolic meaning that is a representation and partial solution of the underlying psychological conflict according to DSM -IV.

Regarding the second mechanism, the person achieves "secondary gain" by avoiding a particular activity that is noxious to him or her and getting support from the environment that otherwise might not be forthcoming. For example, with a paralyzed hand a soldier can avoid firing a gun. Moreover, explains Lachman; an individual may develop a conversion blindness or deafness to get out of a particular job or avoid an unpleasant or painful situation. The symptoms relate to the motives and conflicts of the persons who display them (DSM-IV, 1994).

Moreover, in explaining the convulsions suffered by the boy, Lachman (1972) cited Kutash, an expert on conversion disorders, who while "commenting on the convulsions produced sometimes during conversion", stated:

> Occasionally in some cases of conversion reaction, one sees cases of hysterical convulsions or fits resembling epileptic seizures but distinguishable from them by the fact that the patient does not usually bite its tongue, injure himself or suffer incontinence. His pupillary reflex to light remains unaffected. The convulsions in the hysteric usually occur in the presence of other people. (p. 19)

To sum up the comments of the aforementioned medical authorities in the context of my assessment of the case, one may ask: Was the Mount Rainier boy suffering from conversion disorder and coprolalia, which were later aggravated by the exorcism? I suspect that the answer should be affirmative in this case. It is important to note that if one provides the diagnosis of conversion reaction, assuming that the symptoms were real, that the documents were truthful, and that the boy was not malingering (that is manufacturing all those things to attract attention, avoid going to school and get a trip to St. Louis to visit his favorite aunt and obtain multiple benefits). However, one must recognize that this is speculation, and that my diagnosis may be questioned.

Moreover, in some correspondence addressed by Schulze to J.B. Rhine in 1949[16], he confirms the existence of marks that further supports my proposed diagnosis. In this regard he points out:

> but meantime words appeared on the boy, according to the family and friends. My physician and I saw no words, but we did see nerve reaction rashes which had the appearance of scratches.

[14] The name of the actor in this case has been changed to protect his identity.
[15] Letter from the Reverend Schulze to J.B. Rhine, April 28, 1949.
[16] Letter from the Reverend Schulze to J.B. Rhine, April 28, 1949,

Moreover, according to Schulze, with regard to the convulsions suffered by the adolescent, the family's physician insisted that he treat the boy with Barbital to stop the convulsions[17]. Also, in another letter addressed to Rhine, he mentioned the use of Barbitol to treat Ronald[18].

Barbitol is a barbiturate, and barbiturates that come in different brand names are sometimes employed and prescribed as hypnotics (sleeping medication) to sedate and relieve anxiety. Sometimes they are used as anticonvulsants to control grand mal epilepsy and seizures (Goodman & Guilman, 1978; Long, 1991). Of course the prescription of this drug is not conclusive evidence in favor of my diagnosis.

Furthermore, in addition to the symptoms mentioned above, which support the diagnosis of conversion disorder, there is another element in the case that further supports such a diagnosis from a psychological standpoint. As we have previously mentioned, the family situation had created a very stressful situation for the boy. For instance, he was having some difficulties at school and his parents, particularly his mother, were putting pressure on him to continue attending school in spite of his psychological problems.

Consequently, as I have indicated in this paper the school had obviously become a noxious stimulus for Ronald and he was trying to avoid it by any means. Such a noxious stimulus, in turn, may have led to a stressful reaction and also may have created what DSM-IV calls a “psychological conflict or need” that evolved into a conversion disorder. The aforementioned speculation on the case is supported by the fact that different marks appeared on the boy's body, such as two large letter “Ns” on his legs. Also, when the possibility of sending him to school while in St. Louis was raised by his mother, the marks expressed a complete denial of the possibility of attending school while there.

The above situation, while far from conclusive, fits the second mechanism suggested by the DSM-IV, to explain the benefits that the person suffering from the condition derives from having a conversion symptom. That is, the person achieves “secondary gain” by avoiding a particular activity that is noxious to him or her and obtains support from the environment that otherwise might not be forthcoming. In the particular case of the marks; they obviously helped him attain his goal and allowed him to live with his preferred aunt and avoid school. For instance, when the mark “St. Louis” appeared on the boy's body, the mother exclaimed rapidly, "We'll go to St. Louis! We'll go to St. Louis.” And she explained later that she felt compelled to obey the messages (Allen, 1993).

CONCLUSION

If one could go back on time and find the opportunity to assess clinically the boy in 1949, it is very likely that one would have had sufficient elements to render a diagnosis of conversion disorder. This would be based on the current diagnostic criteria of the DSM-IV for “conversion disorder” with the code 300.11(DSM-IV, p. 457).

Furthermore, it is important to note that the DSM-IV indicates that before the diagnosis of conversion disorder is made, one needs to exclude other conditions that resemble this disorder, such as catatonic symptoms, somatic delusions in schizophrenia, and the like. In my evaluation of the case, I did not find evidence suggestive of any of these conditions. The conversion symptoms, which cause the skin to become so sensitive that even a “fingernail drawn on the skin may cause marks”, may have facilitated the boy to make the marks on himself and he may have taken advantage of this situation and may have manufactured some of the marks himself. What started as conversion disorder may later have ended up as something mixed with the other condition known as “malingering.” This in turn is suggestive and indicates that fraud may have been a part of this case.

Regarding the poltergeist hypothesis, one that is also addressed in the book, there are elements in the case that present us with a myriad of unexplained phenomena that can parsimoniously be explained by a poltergeist hypothesis, if the data are accurately presented.

The case itself presents the psychological profile of a poltergeist agent; although there are methodological problems in the diagnosis of old cases that need to be further discussed (Martinez Taboas, 1980). In this case I

[17] Interview by Rueda with the Reverend Schulze, July 25 1990.
[18] Letter from the Reverend Schulze to J. B. Rhine, May 2, 1949.

found indications of an adolescent frustrated with his schooling and his parents. Along these lines, regarding the psychological dimension of poltergeist cases, Fairley (1988) declares that "Another piece of conventional wisdom is that the poltergeist is the product of unhappiness, guilt or sexual frustration, particularly in adolescent children, a release of emotion converted into a playful force which can move objects or disrupt households" (Fairley, 1988; see also Martinez Taboas, 1980, for a criticism of these ideas).

In my evaluation of the case, I also found some information very suggestive that some of the phenomena, particularly, those of a seemingly poltergeist nature, may have been manufactured by the adolescent. Nevertheless, some phenomena appear to be of a poltergeist nature, if those witnessed by the Reverend Schulze were accurately reported.

Cases like the one discussed here require both a psychological and a medical analysis. Bowdern and Holloran, two of the exorcists in the case, took matters lightly and diagnosed the case as possession without first considering a thorough medical evaluation, as advised in the Ritual Catholic Romanum.

While there are problems with retrospective diagnoses of poltergeist phenomena (Martinez Taboas, 1980), some of the symptoms manifested fit a psychiatric condition known as conversion disorder. Also, the marks, and seizures, resembled those of epilepsy, according to Schulze who witnessed them. However, the boy did not bite his tongue, as is typical in epileptic seizures. Nevertheless, the strange circumstances under which the marks appeared on the boy's body suggested that the boy may have been malingering to avoid going to school and to live with his preferred aunt. Moreover, the strange characteristics and pattern of the sounds and scratches on the wall and furniture suggest also that somebody may have assisted the boy through trickery to accomplish his goal.

Finally, it would be rather difficult to interpret the case entirely in the context of the aforementioned fraud hypothesis. It is likely, as Schulze's very objective and skeptical testimony indicates that some of the phenomena may have been the result of poltergeist activity. The case does not have a single causal factor, as it is typical of most cases surrounding poltergeist activity.

To conclude, I believe that the Mount Rainier case was a typical case of poltergeist activity, but one in which the religious element played an important part in converting the case into one of alleged demonic possession. Moreover, the boy was also suffering from conversion disorder symptoms, which may have been facilitated by malingering, manifested in making the marks on his body in order to accomplish his goal to avoid going to school and go to live with his preferred aunt. In summation, parsimony requires abandonment of demonic possession in favor of a disorder reaction possibly accompanied by poltergeist activity and, on occasion, by deliberate fraud.

References

Allen, T. (1993). *Possessed: The true story of an exorcism*. New York: Doubleday.

Alvarado, C. S. (1997). Proof and process: Approaches to the study of spontaneous parapsychological phenomena. *Journal of the Society for Psychical Research, 61,* 221-234.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th edition). Washington, DC: Author.

Barrett, W. F. (1926). *Death-bed visions*. London: Methuen & Co.

Blatty, W. (1999) *I'll tell them: I remember you*. London. Marble Hill Books.

Blatty, W. (1973) *The exorcist*. New York. Bantam.

Bozzuto J (1975) Cinematic neurosis following "The Exorcist". Report of four cases. *Journal of Nervous and Mental Disease, 161*(1), 43-48.

Burke, K. (1977) Cinematic neurosis following "The Exorcist." *Journal of Nervous and Mental Disease, 161* (1), 43-48.

Brinkley, B. (1949 August 20). Priest frees Mount Ranier boy held in Devil's grip. *The Washington Post.*

Cardeña, E., Lynn, S. J. & Krippner, S. (Eds.). (2000). *Varieties of anomalous experience: Examining the scientific evidence*. Washington, D. C.: American Psychological Association.

Gauld, A., & A.D. Cornell (1979). *Poltergeists*. London: Routledge & Kegan Paul.

Goodman, L., & Guilman, A. (1975*). The pharmacological basis of therapeutics*. New York. Macmillan Publishing.

Gunther, M. (1974, Spring). The actual case that became the basis for movie happened in 1949. *The National Tattler*, p.4.

Krippner, S. (1997). Dissociation in many times and places. In S. Krippner & S. M. Powers (Eds.), *Broken images, broken selves: Dissociative narratives in clinical practice* (pp. 3-40). Washington, D. C.: Brunner/Mazel.

Lachman, S. (1972). *Psychosomatic disorders: A behavioristic interpretation*. New York: John Wiley and Sons.

Long, J. (1977). *The essential guide to prescription drugs*. New York: Harper and Collins Publishers, Inc.

Martinez Taboas, A. (1980). The psychopathological model of poltergeist phenomena: Some criticisms and suggestions. *Parapsychology Review, 11*(2), 24-27.

McManus, J. (Ed.). (1987). *Mysteries of the unknown*. Alexandria, VA: Time-Life Books.

Nicola, J. (1974). *Diabolical possession and exorcism*. Chicago, Illinois: Tan Books Publishers.

Rogo, D.S. (1978). *Minds and motion: The riddle of psychokinesis*. New York: Taplinger.

Taylor, J. (1975). Possession and exorcism.*The Expository Times*, *86* (12), 359-363.

W. M. Thornburn. (1915) Occam's razor. *Mind*, 24, 287-288.

White, R. A. (1982). Saintly psi: A study of spontaneous ESP in saints. In W. G. Roll, R. L. Morris, & R. A. White (Eds.), *Research in Parapsychology 1981. Abstracts and Papers from the Twenty-fourth Annual Convention of the Parapsychological Association, 1981* (pp. 124-127). Metuchen: The Scarecrow Press.

'PSYCHIC DMILS': ATTEMPTED REMOTE FACILITATION OF PERFORMANCE IN AN ESP GAME, AND AN EXPLORATION OF GENDER DIFFERENCES

Caroline Watt, Christine Fraser, & Alexandra Hopkinson[1]
University of Edinburgh

ABSTRACT

Braud, Shafer, McNeill, & Guerra (1995) were the first to extend the physiological DMILS paradigm to enhancing performance on a cognitive task: what one might term 'cognitive DMILS'. Participants were asked to focus their attention on a lit candle and indicate when they became distracted by pressing a button. At the same time, a distant person followed a randomised counterbalanced influence[2] schedule. During Help periods they attempted to help the remote participant maintain their attention on the candle, and during Control periods they turned their attention elsewhere. Five out of seven studies using this remote facilitation of attention focusing paradigm have found evidence suggesting a remote facilitation effect: that is, fewer distractions when being remotely helped. When discussing their cognitive DMILS paradigm, Braud et al. (1995) suggested that remote helping might also extend to psychic performance. That is, one individual may be able to use their mental intention to remotely enhance the psychic performance of another individual. The present study explores this suggestion by asking participants to remotely facilitate a partner's performance on an ESP game. One might term this 'psychic DMILS'. The study hypothesises a remote helping effect so that there will be higher ESP game scoring during Help epochs compared to Control epochs. In addition, we investigated whether there are sex differences in performance on remote helping tasks because sex role stereotypes tend to represent women as 'the caring sex' and thus more inclined to give and be receptive to help than men. Prior to playing the ESP game, participants completed a questionnaire designed to assess willingness to give and to receive help. Seventy-two participants each played the ESP game while a partner in a separate room followed a randomised influence schedule of eight two-minute Help and Control Periods. There was no significant difference between the number of ESP hits during Help periods compared to Control periods ($t[71] = 0.81$, p(2-t) $= 0.42$, effect size $r = 0.09$), therefore the hypothesis was not supported. Possible reasons for the null outcome are discussed. Exploratory analyses found that male and female participants did not greatly differ in overall hitrate, however a significant interaction was found such that females scored more highly on the ESP game when they were being helped, whereas male participants scored more highly when they were *not* being helped. This trend seems consistent with sex stereotypes, and participants' responses on the questionnaire assessing willingness to give help were also consistent with the stereotypical pattern. Female participants indicated significantly greater willingness to *give* help than male participants. There was little differenc between male and female participants on willingness to *receive* help. Finally, in order to stimulate consideration of the question of gender differences in DMILS research, we provide additional post hoc analyses by gender in Watt and colleagues' three previously-published studies of remote facilitation of attention focusing.

[1] We would like to express our gratitude to Professor Robert Morris for his support and advice during this study.
[2] We use the term *influence* in order to describe the experimental task as it is presented to the participants. However, this does not assume that the mechanism or direction of effect underlying DMILS effects is known.

INTRODUCTION

Direct Mental Interaction with Living Systems (DMILS) research usually asks whether one person can influence the physiology of another distant individual through mental intention alone. The physiological measure is normally electrodermal activity (EDA), which is an indicator of autonomic nervous system arousal. The studies can be broken into two main types: remote staring, and remote influence. In the former, the question is whether being remotely stared at affects the staree's EDA. In the latter, researchers want to know whether remote mental intention can influence a target person's EDA. These EDA-DMILS studies date from the 1970s (Schlitz & Braud, 1997) and have been recently meta-analysed (Schmidt, Schneider, Utts, & Walach, 2004).

The early EDA-DMILS studies showed a relatively robust effect (Schlitz & Braud, 1997), therefore Marilyn Schlitz, William Braud and colleagues considered whether remote influence could extend beyond physiological effects, and apply also to higher level cognitive and behavioural processes. The idea is certainly one that makes intuitive sense, as individuals often 'think positive thoughts' when friends and loved ones are facing important challenges such as exams and driving tests. The first study exploring this question within the DMILS paradigm (Braud, Shafer, McNeill, & Guerra, 1995) used a simple attention focusing task. Sixty participants were asked to focus their attention on a lit candle and indicate when they became distracted by pressing a button. At the same time, a distant person followed a randomised counterbalanced influence schedule during which they attempted to help the participant maintain their attention on the candle. There were eight 1-minute Help periods and eight 1-minute Control periods. The study found that participants had significantly fewer distractions during the Help periods compared to the Control periods. A number of researchers, mostly based at Edinburgh University, have followed-up on Braud et al.'s (1995) work, using the same remote facilitation of attention focusing task. Brady & Morris (1997) reported significant evidence of remote facilitation using this task. Subsequently, two studies by Watt and colleagues did not find evidence of remote facilitation of attention focusing (Watt & Brady, 2002, Watt & Baker, 2002), while Watt's third study found that participants had significantly fewer distractions when a distant individual was attempting to help them focus attention[3] (Watt & Ramakers, 2003). The same task was used in two studies conducted in Bali by Hoyt Edge and colleagues (Edge, Suryani, Tiliopoulos, & Morris, 2004). Both studies found that participants had significantly fewer distractions during the Help periods compared to the Control periods. In sum, five out of seven studies have found evidence suggestive of remote facilitation of attention focusing.

Although only seven studies have been carried out using this remote facilitation of attention focusing paradigm, these initial results suggest a relatively robust remote helping effect. When Braud et al. (1995) first introduced the remote helping task, they noted that remote helping might also extend to psychic performance. That is, one individual may be able to use their mental intention to remotely enhance the psychic performance of another individual. The present study therefore extends cognitive/behavioural DMILS to a new task – remote facilitation of performance on an ESP game. One might term this 'psychic DMILS'. The study hypothesises a remote helping effect so that there will be a significant difference in ESP game scoring comparing Help epochs to Control epochs. The analysis will be two-tailed because to the best of our knowledge this is the first time that this 'psychic DMILS' methodology has been attempted. In addition, we investigate whether there are sex differences in performance on remote helping tasks because sex role stereotypes tend to represent women as 'the caring sex' and thus more inclined to give and receive help than men. This paper also reports exploratory analyses looking at gender effects in this psychic DMILS study and in Watt and colleagues' three previous cognitive DMILS studies.

[3] Edge, Suryani, Tiliopoulos, & Morris (2004, p.292) incorrectly state that Watt and colleagues reported null psi results in three out of four of their remote facilitation of attention focusing studies. In fact Watt and colleagues report null results in two out of three studies. The first study in the series of four (Watt & Brady, 2002) was found to contain an artifact and thus did not report psi results.

METHOD

ESP game

The ESP game was "Garden of Dreams", developed by Dean Radin as part of an online research project at the Institute of Noetic Sciences (http://www.psiarcade.com/garden/)[4]. The game involves the participant selecting which of five keys they think will unlock an oriental-style gate. After the participant makes their selection by clicking the mouse on a key, the program pseudo-randomly chooses a target key based on the timing of the mouse-click relative to the PC's system clock. If the chosen key is correct the padlock on the gate will unlock and participant's success is indicated in the corner of the screen. If the first key chosen is not successful the padlock will not open and the procedure is repeated until the correct key is found. When this happens a summary showing how many keys have been used on the lock and the player's average is displayed. The player repeatedly played the game for the duration of the 16-minute session. To simplify statistical analysis, a 'hit' was scored if the player chose the correct key on their first choice only. Mean chance expectation of a hit was therefore 20%. Hits and misses were manually recorded by the experimenter for each complete game (trial) played within an epoch. Any trials that spanned an epoch change were discarded[5].

Remote facilitation task

A Powerpoint slideshow was used to present instructions to the remote helper on screen. The slides told the helper when to focus on helping the player succeed at the ESP game and when to distract themselves by reading a book. The slides were set so that they changed automatically every two minutes. After a two-minute 'welcome' slide, there were 8 slides, each consisting of a randomised and counterbalanced sequence of four two-minute Help and four two-minute Control periods (e.g., HCHCCHCH), chosen from a total of 16 possible different sequences. Thus in the present study there were eight two-minute epochs, whereas the previous remote facilitation of attention-focusing studies all used sixteen one-minute epochs. The screen background colour was green for Help periods and red for Control periods, so a change of instruction could be easily noticed. The final powerpoint slide asked the helper to wait for the experimenter. The Powerpoint program was initiated by the experimenter and was locked with a password to prevent tampering.

Randomisation procedure

There were a total of sixteen different powerpoint files, each corresponding to the 16 different Help/Control sequences. Well in advance of the start of the testing phase of this study, the 16 sequences were given letter names (K-Z) that gave no information as to the order of the sequence, and were split into two groups, each numbered from one to eight. (e.g., Group 1, sequence 1 = K; Group 2, sequence 1 = L; Group 1, sequence 2 = M, etc.). In order to randomly select one of these sequences for a session, just prior to the session the experimenter used random number tables to select firstly the group number (1 or 2), and secondly the sequence number (1 to 8). Using this procedure the experimenter and player remained blind to the Help/Control sequence in each session.

Apparatus and materials

The study took place in three small non-adjacent rooms in the Psychology Department, one for experimenter, player, and helper. The distance between the helper's and the player's room was 16.5 metres, while the experimenter's room was directly opposite the door of the player's room. During each

[4] We are grateful to Dean Radin for permission to use Garden of Dreams in the present study.

[5] If participants scored a miss on their first guess, the trial would last longer and therefore would be more likely to span a change in epoch and be discarded. This could lead to a slight tendency to have a greater number of hits than misses, leading to the possibility of an artefactual overall psi effect (hence we do not report overall psi results). However, such a tendency would not be related to the type of epoch (help or control) or the type of participant (male or female), so these comparisons are valid.

session, the doors of the helper's and player's room were closed, but the experimenter's door was open so that anyone entering or leaving the player's room could be observed. Each room contained a PC. Internet Explorer was used for the ESP game, and Real VNC software linked the experimenter's and player's PCs so the experimenter could view the game as it was played in order to record the scores.

A sheet of instructions for the participants was put in each room. Each participant also completed two questionnaires before the session started. The first questionnaire included twelve questions regarding willingness to give and receive help (see Appendix), devised specially for this study by CF and AH. There were six questions to assess willingness to give help in everyday life, and six questions to assess willingness to receive help in everyday life. Half the questions were reverse keyed. Scores on each scale could range from -24 to +24, and higher scores indicated greater willingness. A pilot version of the questionnaire was administered to 10 individuals showing that scoring was sufficiently reliable (Cronbach's alpha = 0.77 for giving help questions, 0.80 for receiving help questions). The second questionnaire consisted of the Australian Sheep-Goat Scale (Thalbourne & Delin, 1993) but results for this measure will not be reported in the present paper.

Participants

Participants were recruited through email, posters and personal contact, and were predominantly psychology undergraduates and their friends and co-workers. Thirty-six pairs were recruited and participants exchanged roles during the session so that each played the ESP game once, so N = 72. There were 48 females and 24 males. Ages ranged from 19 to 60 years, mean age = 24.5 (SD = 8.7). CF and AH each acted as experimenter for approximately half of the trials, and CW was the study supervisor.

Procedure

On arriving at the lab, participants were met by the experimenter and the procedure was described to them. Participants' mobile phones were switched off and left in the experimenter's room. The ESP game was demonstrated for participants and they completed the questionnaires. The participants chose who would play the ESP game first. The player was taken to their room and asked to read their instruction sheet. Then the helper was taken to their room and asked to read their instruction sheet. If there were no further questions the experimenter simultaneously started the Powerpoint slide sequence and a stopwatch. While the helper viewed the welcome slide, the experimenter closed the door of the helper's room and went to the player's room. If there were no further questions, the experimenter explained that the player would see the mouse move when it was time to start playing the game. This was possible because the Real VNC software allowed the experimenter to control the player's PC. Then the experimenter closed the door of the player's room and returned to the experimenter's room. When the stopwatch showed that 2 minutes had elapsed, the experimenter moved the mouse and the player began to play the game. Thus the helper's first condition began at the same time as the player started to play the game.

After all 8 epochs were over the experimenter went to the participants' rooms and told them to stop. Helper and player then swapped roles and read their instructions. The experimenter started a new, randomly-chosen slide sequence on the helper's PC, and the procedure was repeated as above.

When the second set of 8 epochs was over, the experimenter brought both participants back to the experimenter's room and thanked them for their participation. As a reward they were given some sweets and, if participants wanted, their contact details were noted down for entry into a prize draw.

RESULTS

TABLE 1:

ESP GAME PERFORMANCE; MCE HITRATE = 20%.

	Help Hits	Help Trials	Help Hitrate (%)	Control Hits	Control Trials	Control Hitrate (%)
Females (N = 48)	398	1907	20.87	347	1880	18.46
Males (N = 24)	170	865	19.65	194	878	22.10
All participants	568	2772	20.49	541	2758	19.62

Remote Facilitation of ESP Game Performance

A related t-test was used to compare the number of hits obtained during Help epochs (mean = 7.89; SD = 2.87) to the number obtained during Control epochs (mean = 7.51; SD = 3.08). This difference was not statistically significant and the effect size (r)[6] was quite low: t[71] = 0.81, p(2-t) = 0.42, r = 0.09. There was therefore no support for the hypothesis that performance on the ESP game would be enhanced during remote help periods.

Exploratory Analysis of Gender Differences

Due to differing availability of participants, there were twice as many females as males in this study, which reduces the power of statistical comparisons. A two-way mixed ANOVA compared male and female ESP hitrates in the Help and Control conditions. There was no main effect of condition (F[1,70] = 0.56, p = 0.46), and there was no main effect of gender (F[1,70] = 1.51, p = 0.22.). However, as can be seen from Figure 1 there was a significant interaction between gender and condition: F[1,70] = 5.75, p = 0.02 (see also Table 1 for raw scores). Females scored higher on the ESP test when they were being helped, but males scored higher when they were not being helped (i.e. in the Control condition).

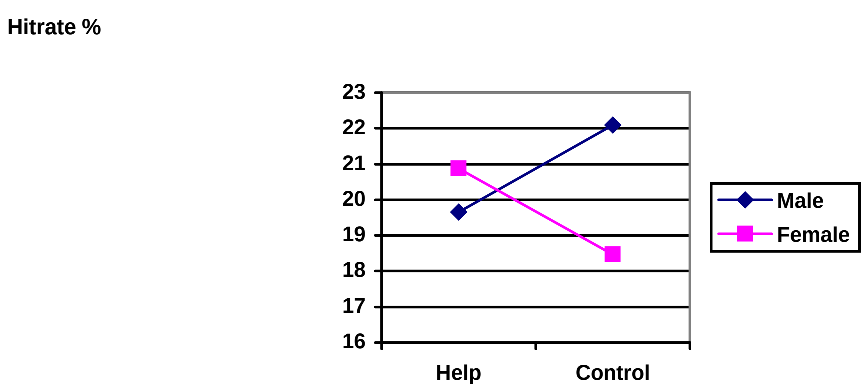

Figure 1: ESP hitrate for male and female participants in Help and Control conditions.

In order to explore this gender difference in greater detail, Table 2 presents descriptive statistics for the 12 questionnaire items assessing willingness to give and receive help in everyday life. There was no significant difference between male and female participants on willingness to *receive* help (t[70] = 0.73, p

[6] Effect size $r = [t^2/t^2+df]^{1/2}$ (Rosenthal & Rosnow, 1991).

(2-t) = 0.47, effect size (d)[7] = 0.18) but female participants indicated significantly greater willingness to *give* help than male participants (t[70] = 3.36, *p* (2-t) = 0.001, d = 0.85).

TABLE 2:

MEAN AND SD (IN PARENTHESES) SCORES ON QUESTIONNAIRE ASSESSING WILLINGNESS TO GIVE AND TO RECEIVE HELP.

	Giving Help	Receiving Help
Females (N = 48)	12.35 (5.00)	6.71 (6.43)
Males (N = 24)	8.25 (4.63)	5.62 (4.84)
All participants	10.99 (5.23)	6.35 (5.94)

DISCUSSION

This study explored the concept of 'psychic DMILS', asking whether it was possible for one person to remotely facilitate another's performance on an ESP game. Before discussing the results of this study, we should point out the study's limitations.

Study limitations

This study has two limitations. We noted earlier that we did not report overall psi results because trials that were a miss would have been longer in duration than hit trials, and would therefore have been more likely to span a change in epoch and to have been discarded. This might introduce a source of bias in the hit-rate. In fact, psi results hovered around chance levels so there is no evidence of such a systematic bias in the data, but the theoretical possibility of bias remains so to be conservative we do not report overall psi results. A better procedure would have been to include trials that spanned an epoch and pre-determine that they would be included in the first epoch. This study also has the theoretical limitation of optional stopping. Optional stopping, in which a study does not have a pre-set number of trials, can introduce a statistical artefact into a study. No participants dropped out of the study, however the study did not have a pre-set number of ESP trials. Instead, participants played the ESP game repeatedly for a set period of time. Some participants may have played the game more quickly than others, and therefore may have completed more trials than others. Participants also received trial-by-trial feedback about their ESP game performance. Therefore the speed at which participants played the game, and the number of trials they completed, *may* have been affected by their perception of their success at the game. The number of trials per session ranged from 27 to 110, with a mean of 76.80 and SD of 16.96, so there was certainly a lot of individual variation in the speed at which the game was played. It is difficult to evaluate whether the possibility of optional stopping has any effect on the overall ESP results of the study, because differing predictions might be made. For instance, participants who noticed they were scoring badly may have become dispirited and then slowed down, or they may have put less effort into each trial and sped up. Or, a mixture of strategies might have been adopted. So, although participant optional stopping is a possibility, it is not obvious that such an effect occurred in this study, and individual differences in reaction to obtaining hits might vary and cancel out any possible optional stopping effect. Experimenter optional stopping in terms of stopping the experiment once scoring had reached a particular level did not take place because the study had a pre-set number of participants.

In order to remove any possible optional stopping effects, future psychic DMILS studies could set a fixed number of trials per epoch that would be included in the analyses, for instance by controlling the rate at which trials are presented to participants. Alternatively, feedback to participants could be removed so that their speed of playing could not be affected by knowledge of performance. Experimenters too would have to be kept blind as to participants' ESP performance. However, we judged that self-pacing and

[7] Effect size $d = t(n_1+n_2)/\ df\ \ n_1n_2$ (Rosenthal & Rosnow, 1991).

feedback would make the ESP task more engaging to participants, as some participants might naturally be inclined to dwell longer on the ESP task than others and might be more motivated if they were aware of their results during the task. Clearly there is a trade-off between ecological validity and methodological rigour, and this is a fine line that experimental parapsychologists have to tread. Optional stopping should not affect the remote helping hypothesis because participants were blind as to when during the session they were being helped. There is empirical support for this theoretically-based assertion in Table 1, which shows that participants completed a similar number of trials during the Help epochs (N = 2772) compared to the Control epochs (N = 2758).

The limitations that we have pointed out are only relevant to the question of overall psi results. They do not affect comparisons between groups of participants (male versus female) or between conditions (help versus control).

Remote helping

There was no significant difference between ESP scoring during Help periods compared to Control periods, so the study's hypothesis was not supported. There are various interpretations of this result. One possibility is that null results were obtained because ESP and direct mental influence do not exist. Alternatively, the study may not have had sufficient power to detect a weak but real remote helping effect. It is difficult to assess the statistical power of this study a priori because we believe this was the first time remote helping has been applied to performance on a psychic task. However, the study did have a greater number of participants, and therefore greater statistical power, than previous statistically significant cognitive DMILS studies. Another possibility is that some aspect of the experimental set-up was not conducive to psychic performance. For instance, the ESP game was not of great personal significance and meaning to participants. From an evolutionary point of view, direct mental influence – remote helping in the case of this study – might be more likely to operate in situations where there is a strong physical or psychological benefit to be gained from being remotely helped or from giving remote help. A future study might attempt to use a more ecologically valid measure of psychic ability, though ethical limitations make it difficult to mirror real-life situations in the lab.

Gender effects

It may be worthwhile considering gender effects in this and our previous remote helping studies. Gender stereotypes tend to portray females as the more 'caring sex' and therefore females might be expected to be better 'helpers' and more amenable to being helped than males. In the present study there appeared to be some empirical support for this idea in performance on the psychic DMILS task. A significant interaction was found between gender and condition, such that females scored higher on the ESP game when they were being helped, whereas males scored higher when they were not being helped. To look at this question in greater detail, this study used a questionnaire to assess willingness to give and receive help. In line with the stereotype, female participants reported significantly more willingness to *give* help than male participants. There was little difference between male and female participants on reported willingness to receive help. Therefore the gender differences in ESP performance are somewhat consistent with the gender difference particularly in willingness to give help, as both appear to be in line with the stereotype of females as the 'caring sex'.

Watt and colleagues have published three previous remote facilitation of attention focusing studies (Watt & Brady, 2002; Watt & Baker, 2002; Watt & Ramakers, 2003). These studies did not provide any breakdown of results according to gender. To extend the picture of gender differences in DMILS studies, Table 3 reports for the first time descriptive statistics for males' and females' performance on the remote facilitation of attention-focusing task. The task was the same as for the original remote helping study by Braud, Shafer, McNeill, & Guerra (1995). Participants focused attention on a candle and pressed a button to note when they became distracted. At the same time a remote individual followed a randomised and counterbalanced influence schedule of 16 one-minute Help and Control epochs. If remote helping was occurring in the study, there would be significantly fewer distractions (button presses) in the Help periods compared to the Control periods.

TABLE 3:

MEAN NUMBER OF BUTTON PRESSES (SD IN PARENTHESES) DURING HELP AND CONTROL EPOCHS, AND OVERALL PSI SCORE FOR WATT AND COLLEAGUES' REMOTE HELPING STUDIES, BY GENDER.

	Males					Females			
	N	Help (SD)	Control (SD)	PIS Score		N	Help (SD)	Control (SD)	PIS Score
Watt & Brady (2002)	20	11.30 (6.55)	11.15 (5.87)	0.50 (0.09)		40	13.22 (9.43)	12.72 (8.87)	0.50 (0.10)
Watt & Baker (2002)	27	13.44 (11.77)	12.81 (11.91)	0.49 (0.15)		53	8.77 (5.34)	9.72 (6.67)	0.52 (0.10)
Watt & Ramakers (2003)	15	9.73 (9.71)	11.40 (10.34)	0.58 (0.14)		21	13.67 (12.34)	14.95 (11.99)	0.52 (0.12)

MCE PIS (percentage influence score) = 0.5, > 0.5 represents a remote helping effect i.e. fewer button presses during Help epochs compared to Control epochs[8].

The descriptive statistics in Table 3 do not show a consistent pattern. In the first study (Watt & Brady, 2002), there is no difference between male and female participants' psi scores (t[58] = -0.34, p(2-t) = 0.74). In the second study (Watt & Baker, 2002), female participants scored slightly higher than males, but not to a statistically significant degree (t[77] = 1.28, p(2-t) = 0.20). In the third study (Watt & Ramakers, 2003), males scored higher than females, but again not to a statistically significant degree (t[34] = -1.22, p(2-t) = 0.23). The inconsistent results from these previous cognitive DMILS studies suggest that gender does not play an important role in remote helping. However, these are exploratory analyses and these studies were not specifically designed to address the question of gender differences in remote helping. This question could be more systematically investigated in future studies. In addition, we have chosen to focus on the role of the participant conducting the psi task. Further analyses could be conducted to explore more complex issues such as the sex of the helper, and different helper/helpee gender pairings.

The power of the gender comparisons described in the present paper tends to be reduced by there being considerably fewer male than female participants, and if gender was to be included as an important variable in future studies then detection of meaningful effects would be assisted by having matched numbers of participants. The significant gender-ESP interaction found in the present psychic DMILS study also deserves follow-up as it was an exploratory analysis and could therefore be a statistical fluke. However, it could be argued that the highly significant gender differences on the questionnaire assessing willingness to give help provide some circumstantial evidence that the gender-ESP interaction is meaningful as well as suggesting that male and female participants may bring different sets of motivations and expectations to remote helping tasks.

[8] See Watt & Brady (2002), Watt & Baker (2002), and Watt & Ramakers (2003), for details of how the overall PIS score was calculated in these studies.

References

Brady, C., & Morris, R. (1997). Attention focusing facilitated through remote mental interaction: A replication and exploration of parameters. *Proceedings of Presented Papers: Parapsychological Association 40th Annual Convention*, pp. 73-91.

Braud, W., Shafer, D., McNeill, K. & Guerra, V. (1995). Attention focusing facilitated through remote mental interaction. *Journal of the American Society for Psychical Research*, *89*, 103-115.

Edge, H., Suryani, L.K., Tiliopoulos, N., & Morris, R. (2004). Two cognitive DMILS studies in Bali. *Journal of Parapsychology, 68,* 289-321.

Rosenthal, R., & Rosnow, R. L. (1991). *Essentials of Behavioral Research: Methods and Data Analysis. 2nd Ed.* New York: McGraw-Hill.

Schlitz, M., & Braud, W. (1997). Distant intentionality and healing: Assessing the evidence. *Alternative Therapies*, *3*, 62-73.

Schmidt, S., Schneider, R., Utts, J., & Walach, H. (2004). Distant intentionality and the feeling of being stared at: Two meta-analyses. *British Journal of Psychology, 95*, 235-247.

Thalbourne, M. A., & Delin, P. S. (1993). A new instrument for measuring the sheep-goat variable: Its psychometric properties and factor structure. *Journal of the Society for Psychical Research*, *59*, 172-186.

Watt, C., & Brady, C. (2002). Experimenter effects and the remote facilitation of attention focusing: Two studies and the discovery of an artifact. *Journal of Parapsychology, 66*, 49-71.

Watt, C., & Baker, I.S. (2002). Remote facilitation of attention focusing with psi-supportive versus psi-unsupportive experimenter suggestions. *Journal of Parapsychology, 66*, 151-168.

Watt, C., & Ramakers, P. (2003). Experimenter effects with a remote facilitation of attention focusing task: A study with multiple believer and disbeliever experimenters. *Journal of Parapsychology, 67*, 99-116.

APPENDIX: QUESTIONNAIRE TO ASSESS WILLINGNESS TO GIVE AND TO RECEIVE HELP

Questionnaire

Please take a moment to complete the questions below; when a question refers to a friend please answer in reference to the person you came to the experiment with.

ESP – Extrasensory perception is a term used to describe the acquisition of knowledge without the use of the normal senses (sight, hearing, touch, smell, and taste).

Age _____ Gender _____

1. Do you believe ESP is **possible** in general? Yes ___ No ___

2. How confident do you feel in your own ESP ability?
   Not at all confident 1 2 3 4 5 6 7 8 9 Extremely confident

3. How confident are you that you can help your friend in this task?
   Not at all confident 1 2 3 4 5 6 7 8 9 Extremely confident

4. Do you feel comfortable with the idea of influencing your friend?
   Not at all comfortable 1 2 3 4 5 6 7 8 9 Extremely comfortable

5. Do you feel comfortable with the idea of being influenced **by** your friend?
   Not at all confident 1 2 3 4 5 6 7 8 9 Extremely confident

6. What is the nature of your relationship?
   Please specify - ____________________

7. How long have you known each other?
   Please specify - ____________________

8. How emotionally close do you feel you are?
   Not at all close 1 2 3 4 5 6 7 8 9 Extremely close

9. I'd make time to help someone if they needed my help.
   Not at all like me 1 2 3 4 5 6 7 8 9 Exactly like me

10. I appreciate it when people offer me help.
    Not at all like me 1 2 3 4 5 6 7 8 9 Exactly like me

11. I prefer working through problems on my own so that I don't have to support other people.
    Not at all like me 1 2 3 4 5 6 7 8 9 Exactly like me

12. I feel uncomfortable asking for help on a problem.
    Not at all like me 1 2 3 4 5 6 7 8 9 Exactly like me

13. I like being able to help friends when they're stuck on a problem.
    Not at all like me 1 2 3 4 5 6 7 8 9 Exactly like me

14. I like working in a group because I know there are others who can help me.
    Not at all like me 1 2 3 4 5 6 7 8 9 Exactly like me

15. It annoys me when people ask me for help with a problem, no matter how good I am at the subject.
    Not at all like me 1 2 3 4 5 6 7 8 9 Exactly like me

16. I'm happy to ask for help when I need it.
    Not at all like me 1 2 3 4 5 6 7 8 9 Exactly like me

17. I'd resent it if someone assumed I needed help ona problem.
    Not at all like me 1 2 3 4 5 6 7 8 9 Exactly like me

18. Even if I'm not great at a subject, if someone asks me for help I'll try and help them.
    Not at all like me 1 2 3 4 5 6 7 8 9 Exactly like me

19. I prefer working on my own so people don't interfere with my work.
    Not at all like me 1 2 3 4 5 6 7 8 9 Exactly like me

20. I think it's a bad idea to help people because then they don't learn to think things through for themselves.
    Not at all like me 1 2 3 4 5 6 7 8 9 Exactly like me

FIELD RNG EXPLORATION DURING A PUBLIC NATIVE AMERICAN POWWOW

Bryan J. Williams
Department of Psychology
University of New Mexico
&
Kindred Hospital Albuquerque
Kindred Hospital Albuquerque – Sandia
Albuquerque, NM 87102

ABSTRACT

The described study was one part of a project attempting to explore the possibility of mind-matter interaction-related "field consciousness" effects on random physical systems during religious ceremonial events that seem to involve a collective, unified attention in their activities. Data were collected from a portable random number generator (RNG) during the 22nd Annual Gathering of Nations Powwow, a two-day Native American ceremonial event held annually in New Mexico that draws the collective attention and participation of large numbers of Native Americans and the general public. The general prediction was for the RNG data to show positive statistical deviations away from standard randomness throughout the event, and a post hoc examination of the data from three individual sub-events that seem to draw the largest attention and/or participation from the audience and the media was also carried out. Analysis indicates that the RNG data were largely random as expected in both cases. An additional post hoc comparison of data from events rated as "high interest" with data from events rated as "low interest" also did not reveal any notable differences. Possible ways to account for these null results are discussed.

INTRODUCTION

This paper describes one part of the 2003 Tart Student Incentive Award project, which was intended to further explore the possibility that human social events, particularly those that have a basis in spirituality, can have an unintentional mind-matter interaction-related effect on the behavior of random physical systems. Random data samples were taken from a portable random number generator (RNG) during the 22nd Annual Gathering of Nations Powwow, held annually in Albuquerque, New Mexico, for this purpose. The reasoning behind the selection of this particular ceremonial event for this exploratory study has two underlying bases, a scientific one and a spiritual/aesthetic one, which are also shared by the project as whole.

The Scientific Basis

A large database of independent laboratory experiments carried out over the past three decades seems to suggest that human mental intentions can have a subtle effect on the behavior of electronic RNG devices, based on the presence of statistical patterns found among the noise of the RNG data output that coincide with the intention (Jahn et al., 1997; Radin & Nelson, 1989, 2003). Preliminary application of these results through field trials seems to further suggest that group social events which can be classified as being highly focused in mass attention, and emotionally engaging or resonant (such as captivating concerts or theater presentations, popular sporting events, and high-interest television broadcasts), can have a similar effect on RNG devices running while the event is in progress. This effect is absent from control data that is taken after the event has concluded, with the RNG data being nominally random as expected (Bierman, 1996; Hagel & Tschapke, 2004; Nelson, 2001; Nelson et al., 1996, 1998; Radin, Rebman, & Cross, 1996). This apparent correlation between human events and randomness deviation patterns in the RNG data is currently not well understood, although a tentative interpretation is that such a correlation might perhaps represent the statistical signature of a possible “group consciousness” or a “group mind” (Nelson et al., 1996, 1998) that formed in relation to the social mental unity or “resonance” of the group involved in the event. There may even be some suggestion that the coherence of this “group consciousness” effect carries over to the surrounding physical environment, as seen in the results of a natural “group consciousness” experiment carried out by Roger Nelson (1997a), which indicated that there tended to be less rain over time on days of Princeton University ceremonies held outdoors when compared to other days.

Some field experiments suggest that group social events based in the spiritual domain are highly conducive to this “group consciousness” effect. RNG data collected during spiritual healing and group meditation events seemed to display notable deviations from standard randomness during the times of the meditation and healing sessions (Nelson, 1997b, 2002; Nelson et al., 1996, 1998; Nelson & Radin, 2003; Radin, Rebman, & Cross, 1996; Rowe, 1998). In a recent analysis, carried out by the author, of the spiritual events formally examined by the Global Consciousness Project, an international research project with the purpose of monitoring for this “group consciousness” effect on a global scale during major world events (Nelson, 2001), it was found that the data from all the events collectively showed a notable deviation from randomness in a global-spanning network of RNG devices that was significantly different from chance (Williams, 2004). The effect has been seen in group ceremonies of other cultures, as well, such as the *Aomori-Nebuta* traditional festival held annually in Japan (Hirukawa & Ishikawa, 2004). All of these findings suggest that further study is warranted.

At least one of the examined spiritual events has been related to Native American traditions. RNG data taken during a shamanistic healing ceremony with the purpose of healing and protecting sacred Native American sites that was performed by a Shoshone medicine man during a visit by the researchers to Devil’s Tower in Wyoming had shown notable deviations from standard randomness throughout the ceremony (Nelson et al., 1998; Nelson & Radin, 2003). This may be another indication that spiritual events could be conducive to the “group consciousness” effect.

The Spiritual/Aesthetic Basis

When you put a thing in order, and give it a name, and you are all in accord, it becomes.

- From the Navajo tradition; appears in Frank Waters, *Masked Gods* (1950)

Aside from its scientific basis, there is also a spiritual/aesthetic basis to this exploratory study, one that the Native American community as a whole may relate to. Being a Native American student of the Laguna tribe, it carries a personal resonance with the author.

Tradition from many tribes speaks of a relatedness or an “interconnectedness” among Native American people, with this interconnected unity representing them as “One People.” Many tribal origin traditions also seem to reflect this, with creation stories from many tribes stating that all Native American people descended from a common spiritual ancestor, and that they spread out following this creation to form the separate tribes that we have today. Despite being separate tribes, it is said that all tribal people remain interconnected through this origin. Similarly, the family unit is the basis for a tribal individual, with he or she being always linked to his or her family and the ancestors that came before him or her. This sort of sacred unity or wholeness is often referred to as *Diyin* by the Navajo Nation, and is also fundamental to ceremonial healing rituals (Maryboy & Begay, 2004). The author has recently argued that such an interconnectedness among tribes may open the way to experiences of psi phenomena among the tribal members (Williams, 2005).

The tradition of the Iroquois Nation speaks of the “Long Body,” a spiritual unity among tribal members that connects them to their family members (both living and deceased), to the spirits, and to their own people across spatial and temporal distances (Aanstoos, 1986). A similar concept is reflected in many other tribes of the American Southwest (Williams, 2005). Annual Pueblo village ceremonies, such as the

Hopi kachina dance, also seem to reflect family and tribal unity through participation, in which "…the energy emanating from the plaza is strong and good; the communal energy is pure and comes from 'good hearts'" (Kealiinohomoku, 1989, p. 58). This seems to be akin to the reported social atmospheres reported in group situations that seem to be conducive to group consciousness (Nelson et al., 1996, 1998).

From an aesthetic perspective, it is arguable that this observed "group consciousness" effect might be reflective of a "Long Body"-like spiritual unity among people that Native American tradition speaks of, representing them not only as "One People," but also as "One Mind." This interpretation would then add an empirical approach to the foundation of Native American beliefs. Similar approaches to Native American traditions were also found recently in students' science projects displayed at the 17th Annual National American Indian Science and Engineering Fair (Contreras, 2004), suggesting many Native American customs and traditions are reflected in the findings of modern science. This forms the foundation for arguing that there may be something physical, and to some degree tangible, to the spiritual concepts that Native American people have believed in for centuries, and the author believes that recognition of this is helpful to the appreciation and preservation of Native American culture. This is in line with what William G. Roll (1981) proposed, in writing that "…scientific validation of the beliefs and practices of [Native Americans] could improve their self-image and perhaps their living conditions as well" (p. 13).

The concept of the "Long Body" was first introduced to parapsychology by Christopher Aanstoos (1986) as a means of advancing the phenomenology of psi experiences. Roll (1987, 1989, 2005) adapted the concept to the description of such experiences, suggesting that it reflects the deep interconnectedness between people, objects, and places at a distance. Roll (1989) writes, "From this perspective [i.e., the "Long Body"], the human mind and the human body are a synthesis of many minds and many bodies. Some are our ancestors in the near and distant past, others are living people, some close to us in space, others distant. In our daily lives, when we act as one single-minded body, the many voices are joined into one. This joining forms the basis of our individuality and of our corporeal existence. It is also the paranormal core of our normal existence" (p. 68). The concept of "group consciousness" seems akin to this, and thus it seems to be in line with the Iroquois concept of the "Long Body."

Based on this past field research, and on the social and tribal unity, collective participation, and spiritual transcendence often displayed at Native American ceremonies, it was hypothesized that the annual Gathering of Nations Powwow might be especially conducive to the supposed "group consciousness" effect, and the study described below was proposed to further explore that hypothesis.

METHOD

Participants

The participants in the study were presumed to be all of those individuals in attendance in the University of New Mexico Arena (The "Pit") to participate in and observe the 22nd Annual Gathering of Nations Powwow over the two-day period of the event, running from April 29 to 30, 2005.

Apparatus

A small, portable, truly random number generator (RNG) device (Orion, Inc./ICATT, Amsterdam, the Netherlands, http://www.randomnumbergenerator.nl/) based on electronic noise was connected to the serial port of a Compaq 1.4-GHz laptop computer (Compaq/Hewlett-Packard, Cupertino, CA). The computer utilized the Microsoft Windows-based FRED software package (Institute of Noetic Sciences, Petaluma, CA) to collect 200-bit samples per second from the RNG. Two 1-hour calibration runs with the RNG performed two days prior to the event indicated an empirical mean around 100.125 and an empirical standard deviation around 7.088, thus indicating a basic sign of nominal randomness comparable to a expected theoretical binary bit distribution mean of 100 and a theoretical standard deviation of 7.071. Digital displays of the bit samples made possible through the use of FRED software package also seemed to indicate a random distribution, with no signs of a consistently biased pattern of outliers that might suggest a malfunctioning RNG. Calibration tests by the manufacturer prior to shipment also confirmed standard randomness of the RNG device.

Procedure

RNG data sampling was based on and followed the tentative event schedule for the 22nd Annual Gathering of Nations Powwow that was posted on the Gathering of Nations Internet website (http://www.gatheringofnations.com/powwow) several months in advance of the event. Continuous sampling for the first day of the event (April 29) was only possible for the evening sub-event session,[1] lasting from the time of the author's arrival and set-up at the arena at 6:10 to 10:07 P.M. Mountain Time. Sampling was continuous throughout the major sub-events of the second day (April 30), running from 12:06 to 10:10 P.M. Mountain Time.

The RNG/computer system was positioned at roughly the same location in the University of New Mexico Arena ("The Pit") for each day of the event. The location was the author's back-row seating position in Section M28 (the northwest section) on the second-level mezzanine of the arena. This seating position allowed convenient access to a continuous, grounded AC power source located in the seating base for constant, uninterrupted operation of the computer and attached RNG. The RNG output was periodically monitored using the FRED software's bits display over course of the day to ensure that the device was still running and collecting data properly. Brief pauses in data collection of about one minute in length were intermittently taken at four-hour intervals to save the data being stored in the computer's memory to the hard drive in order to prevent data loss in the event of an unforeseen system power failure or an accidental dislodging of the computer's power cord by the frequent movement in and out of the seating row by audience members. No such power failure occurred, and all collected data were saved successfully.

Through the utilization of the FRED software, accurate time-stamping of the RNG data at the beginning and end of each sub-event was done. The computer's internal clock was synchronized with an Internet timeserver prior to the event to ensure accurate time. For the second day, this time-stamping process was also independently backed up through a paper time log kept by the author for accurate marking of event duration.

Analysis & Predictions

Analysis of the RNG data is done using conventional statistical methods (see Nelson, 2001, for more extensive details): The raw data are first converted to normalized z-scores following the equation $z = (x - 100)/\ 50$, where x is the individual RNG sample for a given second, 100 is the theoretical mean for a binomial distribution, and 50 is the trial sum variance. These z-scores are then squared to create a mean deviation value with 1 degree of freedom (*df*) that is Chi-square distributed. Since Chi-square values are additive, a cumulative summation of all of the scores is taken across time (with *df* = number of values summed) to represent the overall measure of mean deviation, and an associated probability value is obtained. Graphical representations of the data over time can then be generated from this cumulative summation (Aron & Aron, 1997; Nelson, 2001; Snedecor & Cochran, 1980). This roughly follows the same data analysis procedure used in a majority of the previous studies of "group consciousness" (e.g., Bierman, 1996; Hirukawa & Ishikawa, 2004; Nelson, 1997b, 2001, 2002; Nelson et al., 1996, 1998; Nelson & Mayer, 1997; Nelson & Radin, 2003; Rowe, 1998; Williams, 2004). An associated z-score was also calculated based on the obtained Chi-square and *df* values (Guilford & Fruchter, 1973, p. 517).

The general prediction was for the RNG data for each day of the event to show a significant cumulative deviation away from standard randomness over the course of the event, primarily in the positive direction. In addition, there were two main *post hoc* explorations that were carried out:

1.) The RNG data from three main highlight sub-events were examined individually to see if the data from each respective sub-event displayed any significant degree of non-randomness. These three main highlight sub-events were: a) The Grand Entry of Dancers, in which all of the dancers participating in the

Gathering of Nations Powwow enter the arena floor in a mass parade of tribal dance, gradually filling the entire floor with dancers moving in unison, often to the point where they are shoulder-to-shoulder. It is a mass spectacle of color and motion; b) The Gourd Dance, in which dancers gather in a single line and slowly move in a circular pattern around the arena floor, shaking gourd rattles and moving to the beat of the ceremonial drums. It is an open dance to anyone with a rattle wishing to participate; c) The Miss Indian World Pageant & Crowning, in which a group of young Native American women from various tribes are competing for the annual ceremonial title of Miss Indian World. During this particular sub-event, the group is down to the last few finalists, and one among them is finally chosen to be crowned, which is followed by a short parade of the new Miss Indian World around the arena. These three sub-events were selected for further exploration because they either appear to draw a large degree of attention and/or participation annually from the dancers, the audience, and the general media; or they seemed to involve a large degree of mass coherence in the sense that the action involved was done in unison and appeared to be highly rhythmic based on subjective estimations. The Grand Entry of Dancers and the Gourd Dance were each held several times through the course of the two-day event, and the RNG data collected from each occurrence of these two sub-events were cumulatively summed to provide an overall estimation of their effect.

2.) As noted above, on the second day of the event (April 30), a paper time log was kept by the author to time-mark the duration of the individual sub-events, and in this log a subjective rating of the degree of interest and attention shown by the individuals in the attending audience was also noted. Sub-events were rated as "high" if there appeared to be a strong degree of audience attention, interest, or reaction during the sub-event (e.g., the three highlight sub-events, a highly-charged dance competition), and rated as "low" if there appeared to be a lack of audience attention or reaction during the sub-event (e.g., brief sound-check pauses, slow dance competitions, participant giveaways). Some previous "group consciousness" research has produced results to suggest a possible difference in structure between data from "high" interest rated events and data from "low" interest rated events (e.g., Radin, Rebman, & Cross, 1996), and this was explored in the current study given the range of interest levels across sub-events that resulted on the second day.

RESULTS

General Prediction

Figure 1 shows the graphical representation for the RNG data collected from the first day of the event (April 29), with the individual sub-events marked. Overall, the data shown in Figure 1 mostly appear to have a random walk as expected of a purely random system, with only a modest suggestion of a trend in the positive direction from about 7:10 to 9:10 P.M. Mountain Time.

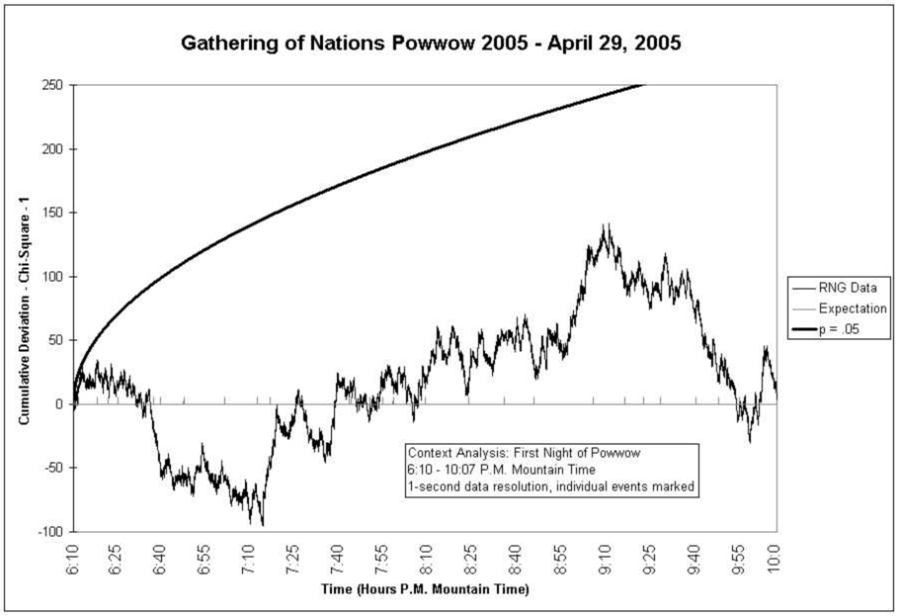

Fig. 1 Graphical representation of the cumulative deviation of Chi-square for the RNG data taken from the first day of the Gathering of Nations Powwow, April 29, 2005. The small tickmarks along the horizontal expectation line indicate the individual sub-events. The smooth curved arc indicates the location of p = .05 as time passes.

The overall statistical result also indicates the general random walk nature of the data in Figure 1, with $\chi^2 = 14216$, 14214 *df*, $p = 0.49$, associated $z = 0.014$. Thus, the general prediction was not confirmed for this first day.

Figure 2 shows the graphical representation for the RNG data collected from the second day of the event (April 30), with the individual sub-events marked. Overall, the data in Figure 2 also show a random walk with no distinct trend present over the length of the collection period, and only brief internal trends that are not clearly distinguishable from chance fluctuations.

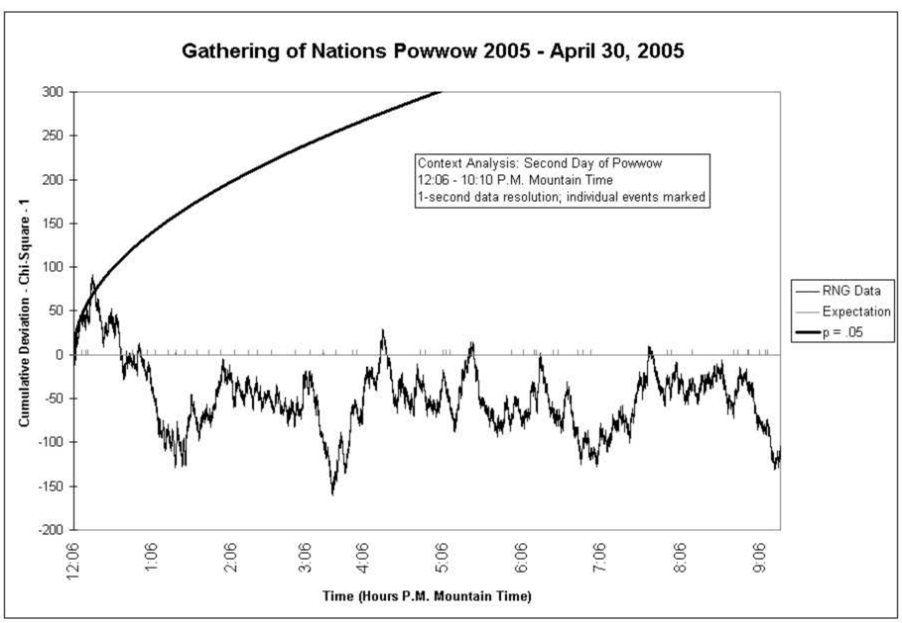

Fig. 2 Graphical representation of the cumulative deviation of Chi-square for the RNG data taken from the second day of the Gathering of Nations Powwow, April 30, 2005. The small tickmarks along the horizontal expectation line indicate the individual sub-events. The smooth curved arc indicates the location of $p = .05$ as time passes.

As with the first day's data, the overall statistical result for this day indicates a general random walk nature, with $\chi^2 = 34864.08$, 34967 *df*, $p = 0.65$, associated $z = -0.387$. Thus, the general prediction was also not confirmed for this day.

Exploratory Analysis 1: Highlight Sub-Events

Table 1 shows the exploratory analysis results for the three main highlight sub-events for the Gathering of Nations Powwow, both individually and collectively.

TABLE 1: GATHERING OF NATIONS HIGHLIGHT SUB-EVENT EXPLORATION RESULTS

Highlight Sub-Event	Date	Time Begin	Time End	Chi-Square	DF	p-value	z-score
Grand Entry – 1st Night	4/29/05	19:12	19:58	2833.18	2743	0.112	1.214
Grand Entry – 2nd Day	4/30/05	12:17	12:57	2356.34	2397	0.719	-0.582
Grand Entry – 2nd Night	4/30/05	20:14	20:57	2574.2	2570	0.472	0.065
Grand Entry Overall				**7763.72**	**7710**	**0.331**	**0.435**
Gourd Dance – 1st Night	4/29/05	18:11	19:01	2970.12	3026	0.762	-0.715
Gourd Dance – 2nd Night	4/30/05	18:58	19:55	3536.02	3453	0.158	0.999
Gourd Dance Overall				**6506.14**	**6479**	**0.404**	**0.242**
Miss Indian World 2005	4/30/05	21:11	21:59	2859.76	2906	0.726	-0.602

Times listed are in Mountain Daylight Time. The listed *z*-scores are associated *z*-scores based on given Chi-square and degrees of freedom (Guilford & Fruchter, 1973, p. 517)

The results in Table 1 seem to indicate that although two of the events (Grand Entry and Gourd Dance) had shown slight positive deviations in the predicted direction, neither of them were significantly different from chance overall. The third event (Miss Indian World) had shown a slight deviation in the negative direction, contrary to prediction, and was also nonsignificant overall. Thus, this exploratory analysis of the three main highlight events appears to have been largely unsuccessful.

Exploratory Analysis 2: Hi-Low Event Data Comparison

Figure 3 shows the combined graphical representation of the data traces for the rated high-low events from the second day of the Gathering of Nations Powwow, April 30. Of the 47 total events that were rated by the author for audience interest and attention, 19 were rated as "high" and 28 as "low." Since the number of rated "high" events was smaller, the graphical trace of the combined data from these events shown in Figure 3 is shorter.

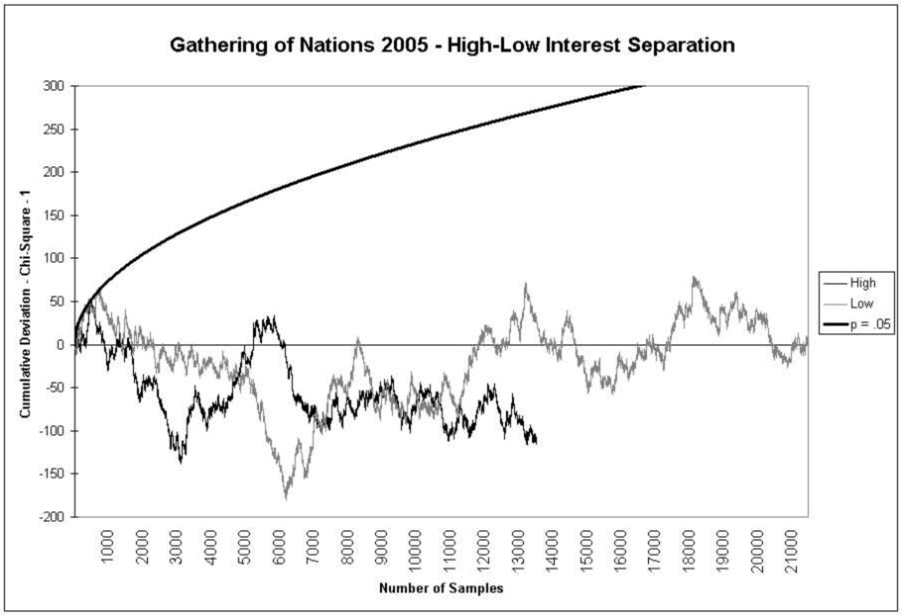

Fig. 3 Graphical representation of the combined results for "high"-rated interest events (blue trace) and for "low"-rated interest events (pink trace) during the second day of the Gathering of Nations Powwow, April 30, 2005. The data for each respective event type are summed across events and graphed together for comparison. The smooth curved arc indicates the location of $p = .05$ as time passes.

Comparison of the graphical traces shown in Figure 3 reveals no distinct difference between the respective data for "high" and "low" interest events, with both showing a similar degree of randomness throughout. Thus, this second exploratory analysis of high-low interest data comparison also appears to have been unsuccessful overall.

DISCUSSION

The results of this exploratory field RNG study carried out during the 22nd Annual Gathering of Nations Powwow suggest that the predictions made for this event were unable to be supported. The general prediction of an overall significant positive deviation away from standard randomness was not confirmed on either of the two days that RNG data were collected, and the two exploratory *post hoc* analyses of examining the selected data from three main highlight sub-events of the powwow, and comparing data from "high"-interest events with the data from "low"-interest events, also did not seem to produce any notable findings.

There may be several possible ways to account for these null results. One way may be to consider the subtlety of psi-related effects. Several different meta-analyses of data from mind-matter interaction experiments seem to indicate that the mind-matter interaction effect is quite small (Jahn et al., 1997; Radin & Nelson, 1989, 2003), and for that reason, may often be difficult to replicate across experiments. Because of the small effect size in mind-matter interaction, large samples of data may sometimes be needed to detect even the weakest of effects. The size of the data sample collected for this study seems comparable to those taken in several other individual field RNG sessions (Hirukawa & Ishikawa, 2004; Nelson, 1997b; Nelson et al., 1996, 1998; Nelson & Mayer, 1997; Nelson & Radin, 2003; Radin, Rebman, & Cross, 1996; Rowe, 1998), so the problem may not be related to power as a function of sample size. Rather, it may perhaps be related to the psychological issues related to field RNG effects, as further described below.

Another way to possibly account for the null effects is to consider the possibility of an experimenter effect (Kennedy & Taddonio, 1976; White, 1976), in which the author's unconscious mind had influenced the results by somehow suppressing the “group consciousness” effect with his presence and observation. It is difficult to know with certainty whether such an experimenter effect could have occurred, although the author has no personal recollection of any particular event or situation during the powwow that could have influenced his own psychological set (e.g., mood, intentions, etc.) in a way that could have contributed to a suppressive experimenter effect (unless the effect was unconscious, as noted above). One might argue, however, that given the test predictions made for the event, the experimenter would have been expected to have a positive expectation for the study, and that since the results are counter to this expectation, they may argue against the possibility of an experimenter effect. Such a situation has been observed and similar arguments made in the case of other field RNG-related studies (e.g., Nelson, 2001, pp. 263 – 264), although it remains unclear as to whether such an argument does indeed factor into consideration of the present data.

It would seem that the third way of possibly accounting for the null data could be a rather strong factor in this case based on the author’s own personal observations, and this is to consider the psychological atmosphere of the crowd gathered in attendance during the powwow. The author noted that throughout the event, both the number of observers present in the audience and the amount of attention directed towards a given sub-event being held on the stage floor frequently varied from moment to moment. Likely reasons for this included distraction from frequent talking and movement among the audience members, and a number of audience members often getting up to go to the restroom, buy refreshments, and/or visit the large Indian Market that was concurrently being held both in the arena lobby and just outside the arena itself. Thus, the number of people present for a given event and the amount of attention paid toward it was rarely constant, and therefore may not have been as ideal in producing conditions facilitative to a “group consciousness” effect as one might hope. Other field RNG studies (e.g., Nelson et al., 1996, 1998; Nelson & Mayer, 1997; Nelson & Radin, 2003; Radin, Rebman, & Cross, 1996; Rowe, 1998) are often carried out at venues that can be described by the authors as being “coherent and unified” in group activity, and these often seem to be the venues in which positive results are found. It is arguable based on this third consideration that the Gathering of Nations Powwow, being a mass public event different from other kinds of more private Native American ceremonies held on Indian reservations (e.g., Kealiinohomoku, 1989; Maryboy & Begay, 2004; Waters, 1950), is simply not as coherent and unified in this sense, and thus detection of a possible “group consciousness” effect during this kind of event may prove particularly difficult.

Further field RNG studies may help shed light on these considerations. A replication field RNG study for this event is tentatively planned for 2006. If null results are again found in such a replication study, with the same psychological atmosphere present, then it may further provide support for the third way of accounting for the present data. In such a case, it would also hint at the importance of considering psychological atmosphere when studying “group consciousness” effects and interpreting data taken in relation to such effects.

ACKNOWLEDGMENTS

This study was supported by a grant awarded to the author through the 2003 Charles T. and Judith A. Tart Student Incentive Award for Parapsychological Research Program by the Parapsychology Foundation in New York. I express my deep appreciation to Dr. Lita Mathews and the members of the Gathering of Nations Committee for granting permission to collect data at the event, to Dr. Dean Radin of the Institute of Noetic Sciences for kindly making the FRED software available to the author, to Dr. Roger Nelson of the Global Consciousness Project and Princeton University for technical advice on the methodology for this project, and to Dr. William G. Roll of the University of West Georgia, for ideas about the long body and for his inspiration.

NOTE

1.) Employment obligations prevented the author from attending the day sub-event session of the first day of the event, thus no data were able to be collected during this time.

References

Aanstoos, C. M. (1986). Psi and the phenomenology of the long body. *Theta*, *13 – 14*, 49 – 51.

Aron, A., & Aron, E. N. (1997). *Statistics for the Behavioral and Social Sciences*. Upper Saddle River, NJ: Prentice-Hall.

Bierman, D. J. (1996). Exploring correlations between local emotional and global emotional events and the behavior of a random number generator. *Journal of Scientific Exploration*, *10*, 363 – 373.

Contreras, R. (2004, March 27). Science, customs can mix. *The Albuquerque Journal*, E1, E2.

Guilford, J. P., & Fruchter, B. (1973). *Fundamental Statistics in Psychology and Education*. New York: McGraw-Hill.

Hagel, J., & Tschapke, M. (2004). The local event detector (LED) - An experimental setup for an exploratory study of correlations between collective emotional events and random number sequences. *Proceedings of Presented Papers: The Parapsychological Association 47th Annual Convention*, 379 – 388.

Hirukawa, T., & Ishikawa, M. (2004). Anomalous fluctuation of RNG data in Nebuta: Summer festival in Northeast Japan. *Proceedings of Presented Papers: The Parapsychological Association 47th Annual Convention*, 389 – 397.

Jahn, R. G., Dunne, B. J., Nelson, R. D., Dobyns, Y. H., & Bradish, G. J. (1997). Correlations of random binary sequences with pre-stated operator intention: A review of a 12-year program. *Journal of Scientific Exploration, 11*, 345 – 367.

Kealiinohomoku, J. W. (1989). The Hopi katsina dance event “doings.” In S. B. Vane & L. J. Bean (Eds.) *Seasons of the Kachina: Proceedings of the California State University, Hayward Conferences on the Western Pueblos 1987 – 1988* (pp. 51 – 63). Ballena Press Anthropological Papers No. 34. Hayward, CA: Ballena Press/California State University, Hayward.

Kennedy, J. E., & Taddonio, J. L. (1976). Experimenter effects in parapsychological research. *Journal of Parapsychology*, *40*, 1 – 33.

Maryboy, N. C., & Begay, D. H. (2004). Ceremonial healing: Traditional ways of healing expressed through Navajo consciousness. *Shift: At the Frontiers of Consciousness, 3*, 25 – 29.

Nelson, R. D. (1997a). Wishing for good weather: A natural experiment in group consciousness. *Journal of Scientific Exploration*, *11*, 47 – 58.

Nelson, R. D. (1997b). Multiple field REG/RNG recordings during a global event, parts I & II. *e-JAP: Electronic Journal of Anomalous Phenomena* 97.2. Available over the Internet at: http:// www.psy.uva.nl/eJAP. Downloaded March 1999.

Nelson, R. D. (2001). Correlation of global events with REG data: An Internet-based, nonlocal anomalies experiment. *Journal of Parapsychology*, *65*, 247 – 271.

Nelson, R. D. (2002). Global harmony. Global Consciousness Project exploratory analysis. Available over the Internet at: http://noosphere.princeton.edu/groupmedit.html. Downloaded August 1, 2002.

Nelson, R. D., Bradish, G. J., Dobyns, Y. H., Dunne, B. J., & Jahn, R. G. (1996). FieldREG anomalies in group situations. *Journal of Scientific Exploration*, *10*, 111 – 141.

Nelson, R. D., Jahn, R. G., Dunne, B. J., Dobyns, Y. H., & Bradish, G. J. (1998). FieldREG II: Consciousness field effects: Replications and explorations. *Journal of Scientific Exploration*, *12*, 425 – 454.

Nelson, R. D., & Mayer, E. L. (1997). Departures from expectation in random event sequences: A FieldREG application at the Christmas Revels. *Internal Report PEAR 97.01/ICRL Report #97.1*. Princeton, NJ: Princeton Engineering Anomalies Research Laboratory, Princeton University, School of Engineering/Applied Science, 12 pp.

Nelson, R. D., & Radin, D. I. (2003). FieldREG experiments and group consciousness: Extending REG/RNG research to real-world situations. In W. B. Jonas & C. C. Crawford (Eds.) *Healing, Intention, and Energy Medicine: Science, Research Methods and Clinical Implications* (pp. 49 – 57). Edinburgh, UK: Churchill Livingstone.

Radin, D. I. (1997). *The Conscious Universe: The Scientific Truth of Psychic Phenomena*. San Francisco: HarperEdge.

Radin, D. I., & Nelson, R. D. (1989). Evidence for consciousness-related anomalies in random physical systems. *Foundations of Physics*, *19*, 1499 – 1514.

Radin, D. I., & Nelson, R. D. (2003). A meta-analysis of mind-matter interaction experiments from 1959 to 2000. In W. B. Jonas & C. C. Crawford (Eds.) *Healing, Intention, and Energy Medicine: Science, Research Methods and Clinical Implications* (pp. 39 – 48). Edinburgh, UK: Churchill Livingstone.

Radin, D. I., Rebman, J. M., & Cross, M. P. (1996). Anomalous organization of random events by group consciousness: Two exploratory experiments. *Journal of Scientific Exploration*, *10*, 143 – 168.

Roll, W. G. (1981). "External mystical powers." In W. G. Roll & J. Beloff (Eds.) *Research in Parapsychology 1980* (p. 13). Metuchen, NJ: Scarecrow Press.

Roll, W. G. (1987). Memory and the long body. *Theta*, *15*, 10 – 29.

Roll, W. G. (1989). Memory and the long body. In L. A. Henkel & R. E. Berger (Eds.) *Research in Parapsychology 1988* (pp. 67 – 72). Metuchen, NJ: Scarecrow Press.

Roll, W. G. (2005). Psi and the long body. *Proceedings of Presented Papers: The Parapsychological Association 48th Annual Convention*, 149 – 161.

Rowe, W. D. (1998). Physical measurement of episodes of focused group energy. *Journal of Scientific Exploration*, *12*, 569 – 581.

Snedecor, G. W., & Cochran, W. G. (1980). *Statistical Methods* (7th Ed.). Ames, IA: Iowa State University Press.

Waters, F. (1950). *Masked Gods: Navaho & Pueblo Ceremonialism.* Athens, OH: Swallow Press.

White, R. A. (1976). The limits of experimenter influence on psi test results: Can any be set? *Journal of the American Society for Psychical Research, 70,* 333 – 369.

Williams, B. J. (2004). GCP technical note: Global harmony revisited. Global Consciousness Project exploratory analysis, December 2. Available for download over the Internet at: http://noosphere.princeton.edu/groupmedit.html

Williams, B. J. (2005). Pueblo parapsychology: Psi and the longbody from the Southwest Indian perspective. *Proceedings of Presented Papers: The Parapsychological Association 48th Annual Convention,* 204 – 218.

PSI, PLACE MEMORY, & LABORATORY SPACE

Bryan J. Williams[1] & William G. Roll[2]
[1] Department of Psychology
University of New Mexico
&
Kindred Hospital Albuquerque
Kindred Hospital Albuquerque – Sandia
Albuquerque, NM 87102
[2] Department of Psychology
University of West Georgia
Carrollton, GA 30118

ABSTRACT

One of the longstanding issues within parapsychology has been the nonrepeatability effect in psi testing. Not only are there psychological factors that seem to contribute to this issue, but there may also be environmental factors aside from the purely geophysical that have received little attention. In this paper, we discuss the possibility that "place memories" inherent in physical objects and places may affect laboratories and the results obtained there. Various experimental studies, directly related to psi or psi-related, that seem suggestive of place memories in the laboratory setting are reviewed, and some implications are discussed.

INTRODUCTION: THE NONREPEATABILITY EFFECT

The nonrepeatability effect in psi experiments has, for the longest time, been one of the main issues within parapsychology. Most attention has been paid to the psychological aspects of the issue, such as the inherent weakness, subtlety, and variation (in terms of reversals of psi-hitting to psi-missing, and vice-versa) of psi in the laboratory; sheep-goat and expectancy effects on the part of the subjects as well as experimenters (see, e.g., Kennedy & Taddonio, 1976; White, 1976), and other such variables. Little attention, however, has been paid to environmental aspects that may have an influence on experimental outcomes, aside from purely physical conditions, such as geomagnetic effects and their correlation with psi performance (Persinger, 1989). Roll (2005) points to another property of laboratory space that may affect results, the "place memories" that may be inherent in physical objects and places.

PLACE MEMORY

The concept of place memory was first proposed by Oxford philosopher H. H. Price (1939) as a way to account for experiences of psychometry and haunting. In Price's sense, one "remembers" the experiences of other people by handling their personal belongings (in psychometry), or occupying the place where they once dwelled (in veridical haunting apparitions). Roll (1989, 1993, 1995) has expanded upon Price's concept by providing a logical argument for the connection between memory and place. According to Roll, the mind, which largely is composed of memories, is embodied within the living brain and body. In turn the body is emplaced within a particular area of space. This suggests that memories, being part of an emplaced mind-body, are also emplaced within that space, and thereby in a sense occupy the space. This could be a basis for veridical haunting apparitions (Roll, 1981), that is, for hallucinations of past occupants that are unknown to the percipient. With regard to place memories, Price (1939) suggested that "…images are persistent and dynamic entities, which when once formed may have a kind of independent life of their own, and may escape more or less completely from the control of their author" (p. 325). He then proposed that "an image or group of images might get itself localized in a particular region of Physical Space…Once localized there, they might continue to be so localized for a considerable period, retaining the telepathic charge which they had at first, though this may gradually diminish in intensity" (pp. 325 – 326). He then went on to add, "If we now take into account the fact that the persisting image did originate in a living human mind, perhaps a long time ago; and if we prefer to conceive of telepathy as primarily a relation between mind and mind…then we may say that haunting is a kind of deferred telepathy resulting in the production of a post-dated telepathic phantasm. It will be a telepathic transaction between Smith as he was ten years ago, when he lived in this room, and me who am in it now. The telepathic impulse from him will have been stored up, as it were, in the persistent and localized image which he originated and left behind him long ago, and the impulse only reaches me today when I come into the room" (pp. 326 – 327). In other words, veridical images of the past that are seen in a particular area may be due to long-lasting localized memories, which Price viewed as independent entities that are akin to telepathic sub-minds, what he called "rudimentary minds" (Price, 1940, p. 384).

Historically, psychometry has seemingly provided some of the best evidence to support the idea of place memory, with the idea of object "memory" stretching back to the days of psychical research (see Roll, 2004, for an overview). In her report of the sittings with Mrs. Leonore Piper, Eleanor Sidgwick (1915) quotes a dialogue between Richard Hodgson (RH) and Mrs. Piper (MP) concerning the nature of the psychometric object (see also Roll, 2004, pp. 713 – 714). Throughout the dialogue, Mrs. Piper speaks as G. P., one of her trance personalities:

RH: How does an object suggest its previous surroundings?

MP: It would be by thought.

RH: If a human being were present instead of the object it would be easy to understand.

MP: Yes, you think.

RH: But an object doesn't think.

MP: No. Yet the object has been found and handled by some person still in the body…if an object has been handled at all it receives what we term an influence for convenience, yet apart from seeing the handler…of it we see a light also which portrays to us a picture.

RH: But the object itself hasn't a picture.

MP: No, not at all.

RH: The picture comes from its connection with the owner?

MP: Yes.

RH: The owner has a mental picture?

MP: Yes, yet we distinctly see the light which to us is connected with the object.

RH: Are the pictures in that light?

MP: No, but it connects us with it.

RH: It comes from persons who have handled it?

MP: Yes, for instance, we get a clear or otherwise picture from the person to whom it belongs.

RH: Good.

MP: Well, what does this explain?

RH: Well, some persons maintain that objects themselves have a kind of memory, they seem to suppose that inanimate objects carry with them mental pictures like those of developed human beings.

MP: Scientifically *not*. No, not at all. (p. 627)

Elsewhere in her report, Sidgwick (1915) quotes another description by Mrs. Piper (again speaking as a trance personality) about the function of the psychometric object: "Objects carry with them a light as distinct to us as sunlight is to you. The instant you hand us an object, that instant we get an impression of its owner, whether the present or the past owner and often both…I find upon examination that almost invariably the object presented to us for information has been of long standing, or otherwise unhandled-untouched by its owner for a period of long duration…" (p. 624). This work with Mrs. Piper led James (1909) to formulate a theory of psychometry in terms of memory. James proposes that memories not only exist in human brains, but also in other physical objects, and that they may be reactivated during a mediumistic session.

Studies in which historic artifacts were used as psychometric objects in order to gain possible insight about the past have also produced findings to suggest a memory-like component to the handled artifact. As part of his series of psychometry sessions with the Polish clairvoyant Stefan Ossowiecki during World War II (Schwartz, 1978/2001, Ch. 2), ethnologist Stanislaw Poniatowski held two sessions spaced three months apart in which Ossowiecki had used the same artifact in both. Ossowiecki's impression of the artifact from the first session was that it had been associated with a prehistoric cremation and burial, and Poniatowski was interested in finding out in the second session whether Ossowiecki would give an impression consistent with his initial one given three months earlier. Schwartz (1978/2001) notes of this second session: "It is impossible to say what Poniatowski anticipated, but it is unlikely he expected what he got: an almost exact replay of the same cremation and burial. Ossowiecki, of course, knew nothing of the control, could hardly have remembered the earlier experiments, since he was untrained in lithics, and probably could not have recognized the tool [i.e., the artifact] – even if he had been able to remember exactly what he had said three years before" (p. 100). A second, related example comes from one of the artifact psychometry studies of Canadian anthropologist J. Norman Emerson, which had involved a psychic "cross-check" (Schwartz, 1978/2001, Ch. 5). Emerson had received a piece of black argillite (a shale-like rock comparable to soapstone in hardness) from a colleague that had been discovered at a Native American settlement site in British Columbia. Since hardly anything was known about its purpose or its origins, Emerson was asked if he would have his psychometrist George McMullen "read" the stone in the hopes that that would shed some light on it. When handed to McMullen, his impression was that the stone had been carved by a black man from Port-au-Prince, Haiti, who had been taken to British Columbia as part of the English slave trade and accepted by the Native Americans there after escaping slavery. When asked to "read" the artifact again, McMullen came up with the same impression and was certain that it truly represented the artifact's history. Moving on the assumption that McMullen was correct, Emerson went about using a number psychics to "cross check" McMullen's impressions, and through his wife's connections in an Edgar Cayce study group, he was able to gather impressions on the argillite artifact from several different psychometrists, all of whom had varying interpretations that centered around an African man in the slave trade as the carver of the artifact (pp. 154 – 155). Emerson was also able to receive further verification of the psychics' impressions when he showed the argillite artifact to Allen Tyyska, a former student of his who had a short-term job with the Royal Ontario Museum cataloguing their collection of West African art. Tyyska confirmed that the artifact did indeed appear to be African, perhaps representing a 'passport mask' that was commonly owned by West African males, only that it was made of argillite (which incidentally is native to British Columbia) rather than wood. On whether the psychics' impressions could be correct and considering that the artifact was a 'passport mask,' Tyyska replied: "I would entertain it very seriously" (p. 157). These two examples seem to suggest that the psychics involved were responding to very similar, if not the same, memory "traces" in the history of an artifact.

More recent applications of psychometry have been found in psychic detection, and examples from this domain also seem to provide hints supportive of place memory. Noreen Renier, a psychic adept in psychometry who has worked with the police in solving cold cases, describes her psychometric experience as almost like becoming the victims or even the criminals involved in a crime: "I feel their pain, I speak their words, I live their deaths. I see the faces of their murderers, and sometimes I become them…I have received the images and feelings that somehow reside in a piece of skull, a vial of blood, a few hairs, the murder weapon" (Renier, with Lucks, 2005, p. 1). At first, she thought that she was reading the minds of the people who brought the objects to be read, but then she found that she was receiving information that no one present had known prior to the session. In one example, a woman had thrust a ring into Renier's hand and asking about what was wrong with her nephew, who had been in a car wreck. Renier replied as she handled the ring, "I see a young man ...curly brown hair ...a scar on the left side of his head" (p. 38). But the woman said her nephew had long bleached blond hair and no scars. It turned out that he had cut his hair four months before the accident and had let it grow into a natural brown curl. In another example, Renier helped to locate a missing plane in the Northeast U.S. during the winter of 1984 (Ch. 16, pp. 183 – 192). The sister of one man who had been a passenger on the plane approached Renier after the search had been unsuccessfully called off, offering the man's wallet as a psychometric object. When Renier's physical description of the wallet's owner was acknowledged by the sister as matching that of her missing brother, she was asked to continue, and she went on to describe a dirt road in a mountainous area near an old gas station with barking dogs in the distance. It was up this dirt road and to the right side of it that Renier claimed the missing plane would be found. Her impression was that there were no survivors of the plane crash except for the woman's brother, who had got out of the plane and sank to the ground with a broken leg. She also offered some numbers and letters, which she felt were significant. These and other details offered by Renier were enough to renew the search, and the area with the old gas station and the barking dogs was found. It turns out that the numbers matched the latitude and longitude coordinates of the area, and the letters matched the first letters of the three towns surrounding it. A heavy snowstorm had postponed the search, though a man and his daughter who had seen the circling search plane overhead went up into the mountains in the area to search and successfully located the plane. The woman's brother was found sitting outside of the plane with a broken leg, but unfortunately he was already deceased. Examples like these seem to suggest object memories that tie the objects to the person who owned them.

Physical locations may also act as psychometric sources as well, seemingly providing literal examples of place memory. Veridical apparitions seen in a haunted location may be the most obvious example, but there are also other lesser-known examples. Aside from using artifacts as psychometric objects, J. Norman Emerson also took his psychometrist George McMullen to the sites of what were once Native American settlements to see if McMullen could provide information useful in reconstructing the structural layout of the settlement as it had existed in the past. Emerson's description of the method that McMullen would generally use in such field tests seems to suggest perception of place memory by McMullen: "George just sort of takes in the lay of the land, rapidly walking around, noting what is there today. Then he seems to become abstracted and begins talking about what he is seeing, which seems to be the site as it was as a functioning Indian village" (Schwartz, 1978/2001, p. 149). Through this method, McMullen was able to locate the buried foundations of building that had once existed on the site, as well as that of a palisade (a high wooden fence surrounding the settlement) that been obscured by natural vegetation (pp. 212 – 221). Charles Garrad, an archaeologist specializing in the Wyandot Indians of Canada and a former student of Emerson's, had also asked the help of psychic Sheila Conway (who he met through Emerson) in his attempt to reconstruct two Wyandot sites dating from the mid-1600s (Schwartz, 1978/2001, Ch. 6, pp. 202 – 211). When brought to the first site, Conway could not only pick up basic surface impressions, but could also reportedly see, smell, and hear the village as it was when it had been inhabited in the 1630s (pp. 203 – 204). Among her impressions, Conway's descriptions of healing rituals at the site were found to be consistent with modern-day research on Shoshone medicine rituals (p. 205). She also described seeing important visitors to the site wearing woven grass capes, which was consistent with documented accounts by Samuel de Champlain of how the Indians had used grass in weaving (p. 206). At the second Wyandot site, Conway was able to describe the appearance of a priest, the church he headed, and the log house that he had lived in, which was consistent with the site being the known location for a Jesuit church in the 1640s that was headed by a priest resembling Conway's description (pp. 208 – 210). In one crime she was asked to help investigate, Noreen Renier had apparently used the crime scene as her psychometric source. The house of a woman known to Dr. David Jones (a cultural anthropologist at the University of Central Florida and Renier's friend and mentor) had been burglarized, and the woman was frantic to get her things back. But the burglars had not left anything in the house and, without an object, Renier did not know how to proceed. But Jones said they had left their energy which Renier could pick up and interpret. Sitting in each room with her new tape-recorder, she saw two men and their gray van. When the burglars were caught a few weeks later, Renier was proven correct (Renier, with Lucks, 2005, pp. 49 – 50). She was using psychometry but this time from inside the object.

Emotion is inherent in memory and reflected in the recall of past events (LeDoux, 1998; Phelps & LeDoux, 2005). Place memories with negative emotion may have negative effects. This would also be consistent with the observation that natural ESP more often involves emotionally significant events that are negative, such as crises, illness, or death (e.g., Feather & Schmicker, 2005; Rhine, 1967; Persinger, 1974, 1, p. 87; Stevenson, 1970). Renier notes of her psi ability, "My mind taps in to the turbulent energy left behind by a moment of explosive violence and I relive the turbulent event." (Renier, with Lucks, 2005, p. 1). When brought to one of the Wyandot sites by Garrad (Schwartz, 1978/2001, pp. 203 – 204), Sheila Conway was overcome with emotion as she described the devastating images she was seeing of the impact of a virus epidemic that European settlers had unknowingly brought on the Wyandots, for which the latter had no immunity. If someone enters the scene of an argument or an act of aggression, the person may unknowingly become infected with the negative emotion and perpetuate it in behavior. Knowing about the possible effect of place memories with negative emotions may enable people to reduce their impact. Conversely it may be possible to permeate an area with positive emotion that affects later occupants. The effect of places with a reputation of healing, such as Lourdes, may not only result from suggestion (Cohen, 2003).

Some interpretations of quantum physics may provide support for place memory by connecting mind and space. One such interpretation involves the role of conscious observation on quantum effects and the formation of physical reality as suggested by Walker (2000). This interpretation suggests that the conscious mind may continually define the external physical reality it perceives moment by moment through the act of observation, causing a collapse of the probability wave function of many possible realities into a single one. Elsewhere, Walker (1979) suggests that the quantum effects and PK involves the same process. Frieden (1998), following the idea of "observer participancy" of Princeton physicist John Wheeler, takes this idea a step further by suggesting that conscious observation can instill information into reality, which includes matter states (e.g., whether a unit of subatomic matter is acting like a particle or a wave), and that this information can include "…the meaning of the acquired data to the observer" (p. 235). Meaning is inherent in memory, in other words, and Frieden at the same time seems to say that memory plays a role in defining reality. The act of conscious observation may instill a bias within the environment that is tied in some way to the (long-term) memory structure of the individual [perhaps in manner similar to that proposed by Irwin (1980)], which provides the meaning. This interpretation may provide a basis for micro-PK (Schmidt, 1982) and for macro-PK, such as RSPK (poltergeist) (Roll, 2003). In the former case, the meaningful bias results in non-random patterns found within the random noise of a random event generator (REG), while in the latter case, movement of objects that are symbolic of the (often negative) relationship between the RSPK agent and the members of his or her family (Roll, 1972/2004; Roll & Storey, 2004).

If memories are imbedded in the environment, then they would be embedded in lab space and equipment, and could distort test results (Roll, 1987, 1988, 1993). By entering the lab space and attempting to respond to the psi target, the subject may be deflected from the target. From this perspective, the experimenter effect (Kennedy & Taddonio, 1976; White, 1976) would take on an additional meaning, in that the experimenter's own memories and intentions would be embedded in the lab and might affect results. In other words, the experimenter would also function as subject in the sense of affecting results (Roll, 1987, 1988, 1993). Roll (2005) quotes an anecdotal account by Braud (email, 4/iii/05): "Chuck Honorton and I, independently, frequently observed, in our free-response ESP studies, something like ‘place memory.’ A research participant sometimes would describe, very closely, what the immediately preceding participant had reported about an ESP target--whether this description matched the correct target for the session or not (these often were too specific to be attributable to general response biases or similar artifacts). It did not seem to matter whether the two participant sessions were separated by minutes, hours, or days. It was as though Person A's images/thoughts/feelings lingered, under certain circumstances, in the testing location and the next person, Person B, tended to report similar things. Chuck and I used to joke that it might have helped to ‘exorcize’ those ‘haunting’ traces--to get them out of the way, so they would not interfere with the psi perceptions of the targets at hand."

Roll (2005) argues that the idea of lab "cleansing" be explored as a means to nullify intrusions of place memories on test results. He suggests that the intention of the "cleanser" might play a role in this process.

Observer participancy may provide a physical perspective on this type of effect (Frieden, 1998). Some PK experiments and field studies suggest that the effect is not limited to the target. In an experiment by Schmeidler (1973) with psychic Ingo Swann, changes in exposed, and also in thermally-shielded, thermistors in different parts of the lab indicated that if the target thermistors showed an increase in temperature, the control thermistors on the other side of the lab would show a decrease, suggesting an interaction between different temperatures or thermistors within this larger space. This would appear to be an example of the principle of conservation of energy. Two informal PK experiments by Puthoff and Targ

(1975) suggest other kinds of environmental effects. In the first study, Swann was able to affect the rate of magnetic field decay within a magnetometer housing as he attempted to visualize its interior structure. It is interesting that Swann visualized the shielded interior of the magnetometer housing to help him focus on the magnetic field, making use of visual imagery, and therefore, memory, in the PK process. In the second study, an unidentified subject intentionally affected the motion of a torsion pendulum at a distance. It appears from these studies that PK may generalize to other parts of the physical environment than the target.

LOCALIZED EFFECTS IN PSYCHICAL RESEARCH, THE LINGER EFFECT, & CONDITIONED SPACE

There are examples within psychical research that are suggestive of localized space effects. Stainton Moses (in Medhurst, 1972), who attended one of the sittings of D. D. Home, the physical medium, said that he and the others present were told that the room should be “consecrated as it were and set apart” (p. 218). Moses, who himself was a medium, observed that this confirmed his own injunction to keep his séance room special. The use of “cabinets,” small areas of a séance room enclosed by black cloth where a physical medium’s energy was said to be focused in order to produce materializations, was commonplace (Cornell, 2001; Rogo, 1974, pp. 158 – 160). More recently, localized space effects are suggested by the linger effect and conditioned space.

Watkins and Watkins (1971), Watkins, Watkins, and Wells (1973); and Wells and Watkins (1975) found that anesthetized mice that were targets for bio-PK revived sooner if treated by psychic than mice treated by people with no apparent healing ability. They also found that the healing effect "lingered" in the spot where a mouse had been revived such that a new mouse placed there would revive sooner than the controls. The most successful subjects were psychics Karen Getsla and Sean Harribance. In a lab demonstration by Watkins and Watkins (1974) of ostensible macro-PK by Felicia Parise on a compass needle, the needle would gradually return to standard north as it was slowly moved away but would again deflect when replaced in the spot where Parise had initially focused on the needle. The linger effect lasted about 25 minutes. In a field study where Mattuck (1979) reported PK-induced temperature changes of liquid mercury in a clinical thermometer tube that the subject held (from the opposite end of the mercury bulb) and concentrated on for about 22 minutes, the thermometer continued to show a small increase after the subject had stopped focusing on it and had handed it back to the experimenter.

Bengston and Krinsley (2000) and Bengston (2004a; 2004b) report findings suggestive of a linger effect in a study of the healing effect of "laying on of hands" on lab mice that had been injected with female breast cancer cells. The experimental mice showed anomalous remission, as indicated by reduction and closure of tumors, which was not observed in the control mice, the latter dying from tumor enlargement within a set time frame. The indication of a linger effect comes from a notable amount (69.2%) of control mice that also showed anomalous cancer remission even though they did not receive the laying on of hands treatment. However, the control mice had been housed in either the same lab or the same building as the experimental mice, and in some cases, had been briefly viewed by the healer, while visiting the experimental mice to treat them. Only when the control mice were housed in a different building, moved to a different city, or put into a geographically distant and untreated laboratory did the control mice show normal cancer tumor growth and die within the expected time.

The linger effect postulated by Watkins and his associates seems similar to the "conditioned space" proposed by physicist William Tiller and his associates (Tiller, Kohane, & Dibble, 2000; Tiller, Dibble, Nunley, & Shealy, 2004) for anomalous changes in the pH levels of commercially bottled water, and for observed changes in the growth rate of *Drosophila* (the common fruit fly) larvae (Kohane & Tiller, 2000; Tiller, Kohane, & Dibble, 2000). The water and the larvae had been exposed to physical measuring devices that had been "imprinted" with human intention (during a deep meditation process). Tiller and his associates observed a continued exponential increase in pH (among other atmospheric variations) over a period of about three months in the place where they had initially left the imprinted device, an effect not seen in geographically distant control sites. In other words, the intention imprinted on the device not only affected objects placed near the device but also the surrounding lab space, suggesting that the imprinted intention "diffused" into this space and "conditioned" it to produce the same effects as did the imprinted device. The effect is strikingly similar to the linger effect observed by Watkins and his associates. It is also similar to area focusing in RSPK reported by Roll (1975, 1978, 2003; Roll & Persinger, 1998).

Crawford et al. (2003) used Tiller's concept of conditioned space in a study of a "bioenergy" healer where they compared the output of an REG in the room where the healing was performed with a control REG in a distant library. The REG in the healing room produced more non-random deviations than the control REG, the difference being significant. Radin, Taft, and Yount (2004) used the Johrei procedure, a 200-year-old Japanese method of spiritual healing, to affect the growth of human brain cell cultures. The Johrei method includes ritual preparation of the room where the healing treatment is to take place; in other words, the method is an attempt to create a conditioned space. In order to register the supposed conditioned space, three REGs were set up to collect data in the room. It was found that on the third day of the experiment all three REGs showed non-random deviations occurring very close to each other in time, suggesting a PK effect in the conditioned space. Blasband (2000) obtained extra-chance results with an REG in a psychotherapeutic setting, indicating that PK effects on the environment may be facilitated by strong emotion. The findings of the three REG studies suggest that healing intention may affect the environment where it is applied.

DISCUSSION

Tiller's (Tiller et al., 2004) concept of conditioned space and his findings seem to say that physical objects and places may acquire what is generally regarded as a property of minds or brains. A familiar usage of "conditioned" is in "conditioned response," i.e., a response that is learnt or acquired by a mind or brain. Indeed "conditioned space" in Tiller's sense suggests that the physical environment may acquire memory-like properties. The same with the linger effect and with area focusing.

For all three concepts, the question arises if the process results in some sort of charge in the place or object that can be recorded, such as an electromagnetic or EM-like charge. In a separate paper about the larvae studies, Kohane and Tiller (2000) suggest that EM fields that have been augmented with some type of information resulting from intention imprinting on the devices they used might be a way to account for the results. They propose that the subjects' intention interacts with particle states at the level of the quantum vacuum, with the resulting change in particle states entailing a kind of "information" that is "imprinted" or "recorded" in physical matter. Some of the secondary effects, like attenuation with distance in space and time, seem to suggest something like this.

An important question is whether we are dealing with an inherent property of matter or only with anomalous experimental effects. If an inherent property of matter, it would be a property of observed matter. This would be consistent with the idea that observation, which is to say, mind or consciousness, is a negentropic source, instilling order on the environment (Puthoff & Targ, 1975, p. 139).

Injecting order on the environment gives it meaning (aside from the emotional sense) through ordered patterns within the surrounding noise. Such an ordered bias should persist within matter states throughout time given that once quantum states are observed, their quantum wavefunction "collapses" into a single determined state that remains unchanged even when observed by others later on. Following Walker (1979), if PK at least in part involves instilling a bias upon quantum matter states within the environment that correlates with the (long-term) memory structure of the observer (and therefore the meaning to them of the information being inserted into the environment through the bias) upon the act of observation, then that bias should remain intact and unchanged and observable by others later on. Irwin (1980) proposed a model of PK which views this relationship between the individual's long-term memory structure and the state of an environmental system as a formed relationship of "concordance" between the two, which may also help to shed light on the ideas only beginning to develop here. The question then becomes, how may this bias be represented?

Some consciousness researchers argue that qualia are subjective aspects or "units" of proto-experience (sometimes associated with a particular sense or thought) that together make up the wider conscious experience of mental states and the external physical world. Hameroff (1998) offers the conjecture that some qualia may exist in external space as one possible physical contributor to the relation between mind and matter, a relation that may contribute to the development of conscious experience. If this conjecture is valid, then this would suggest that qualia may have a physical component and may be present as units of “sub-mind” in the external world. Perhaps interactions between mind and matter through PK may involve such a relation, instilling the environment with qualia that have a "memory" or "meaning" component.

In the sense described here, qualia seem akin to Price’s concept of “rudimentary minds.” In defining the concept, Price (1940) has written: “We could say that memory is not just a property of living organisms…but that it, or something essentially like it, is a property of every point of physical space, or at any rate that it is a property of all those places from which ‘perspectives’ exist. We could then suggest that these rudimentary ‘place-memories’ can on occasion affect human minds telepathically, and this would be the explanation of Clairvoyance. This amounts to saying that every point in physical space, or at least every point from which perspective exist, is the ‘point of view’ of a rudimentary mind, and that there is a telepathic linkage between these rudimentary minds or sub-minds and ourselves” (p. 384). If qualia represent physical units of “sub-mind” in the external world as suggested above, then they would be similar to Price’s concept of rudimentary mind in that they could be seen as large clusters of perspectives and memories that are spread across the fabric of space-time. The clusters would be accessible to the human mind through the interaction between mind and matter that may underlie conscious experience. In the same way that points of physical space are perspectives and memories that can be remembered according to Price, qualia as “sub-mind” units may contain an aspect of “place memory” that form the basis for a remembered place, event, or person in a given area of space-time.

The interaction between observer and what is observed may build up something like a continuous "dynamic memory loop" within the joint space, like two tuning forks coming into acoustic wave resonance, as suggested by Schwartz and Russek (1999). Or, as Price (1940, p. 384) suggests, memory may be a part of every point of physical space, through the enfolding of mind and matter at the most fundamental level. In that sense, once there is movement within one's mind, there is movement within the surroundings. The linger effect may suggest a long-term or repeated PK effect on a particular, localized area of space where place memories have been embedded. This could account for area focusing in cases of RSPK, where object displacements repeatedly occur within a particular area of the event location (Roll, 1975, 1978, 2003; Roll & Persinger, 1998). PK-based area focusing might also account for apparitions that seem to reflect the personality of a living occupant (Roll, Maher & Brown, 1992; Roll, 1994) or that may resemble an occupant (Roll, et al., 1996).

References

Bengston, W. F. (2004a). Methodological difficulties involving control groups in healing research: Parallels between laying on of hands for the treatment of induced mammary cancers in mice to research in homeopathy? [Letter to the Editor]. *Journal of Alternative and Complementary Medicine, 10,* 227 – 228.

Bengston, W. F. (2004b). Some methodological implications of "resonance theory" for control groups in healing research. Paper presented at the 23rd Annual Meeting of the Society for Scientific Exploration, Las Vegas, NV, May 19 – 22.

Bengston, W. F., & Krinsley, D. (2000). The effect of the "laying on of hands" on transplanted breast cancer in mice. *Journal of Scientific Exploration, 14,* 353 – 364.

Blasband, R. A. (2000). The ordering of random events by emotional expression. *Journal of Scientific Exploration, 14,* 195 – 216.

Cohen, K. (2003). Where healing dwells: The importance of sacred space. *Alternative Therapies in Health and Medicine, 9,* 68 – 72.

Cornell, A. D. (2001). Mental and physical mediumship. *International Journal of Parapsychology, 12,* 163 – 179.

Crawford, C. C., Jonas, W. B., Nelson, R., Wirkus, M., & Wirkus, M. (2003). Alterations in random event measures associated with a healing practice. *Journal of Alternative and Complementary Medicine, 9,* 345 – 353.

Feather, S. R., & Schmicker, M. (2005). *The Gift: ESP, the Extraordinary Experiences of Ordinary People*. New York: St. Martin's Press.

Frieden, B. R. (1998). Physics from Fisher Information: A Unification. Cambridge, UK: Cambridge University Press.

Hameroff, S. R. (1998). "Funda-mentality": Is the conscious mind subtly linked to a basic level of the universe? *Trends in Cognitive Sciences, 2,* 118 – 127.

Irwin, H. J. (1980). PK and memory: An information-processing model of psychokinetic effects. *Journal of the American Society for Psychical Research, 74*, 381 – 393.

James, W. (1909). Report on Mrs. Piper's Hodgson-control. *Proceedings of the Society for Psychical Research, 23*, 2 – 121.

Kennedy, J. E., & Taddonio, J. L. (1976). Experimenter effects in parapsychological research. *Journal of Parapsychology, 40*, 1 – 33.

Kohane, M. J., & Tiller, W. A. (2000). Energy, fitness, and information-augumented electromagnetic fields in *Drosophila melanogaster*. *Journal of Scientific Exploration, 14*, 217 – 231.

LeDoux, J. (1998). *The Emotional Brain: The Mysterious Underpinnings of Emotional Life*. New York: Touchstone/Simon & Schuster.

Mattuck, R. D. (1979). Probable psychokinetic effects produced in a clinical thermometer. In S. Krippner (Ed.) *Psychoenergetic Systems: The Interaction of Consciousness, Energy, and Matter* (pp. 35 – 40). New York: Gordon & Breach.

Medhurst, R. G. (Ed.) *Crookes and the Spirit World*. New York: Taplinger Publishing.

Persinger, M. A. (1974). *The Paranormal*. New York: M.S.S. Information.

Persinger, M. A. (1989). Psi phenomena and temporal lobe activity: The geomagnetic factor. In L. A. Henkel & R. E. Berger (Eds.) *Research in Parapsychology 1988* (pp. 121 – 156). Metuchen, NJ: Scarecrow Press.

Phelps, E. A., & LeDoux, J. E. (2005). Contributions of the amygdala to emotional processing: From animal models to human behavior. *Neuron, 48*, 175 – 187.

Price, H. H. (1939). Haunting and the "psychic ether" hypothesis: With some preliminary reflections on the present condition and possible future of psychical research. *Proceedings of the Society for Psychical Research, 45*, 307 – 343.

Price, H. H. (1940). Some philosophical questions about telepathy and clairvoyance. *Philosophy, 15,* 363 – 385.

Puthoff, H., & Targ, R. (1975). Physics, entropy, and psychokinesis. In L. Oteri (Ed.) *Proceedings of an International Conference: Quantum Physics and Parapsychology* (pp. 129 – 142). New York: Parapsychology Foundation, Inc.

Radin, D. I., Taft, R., & Yount, G. (2004). Effects of healing intention on cultured cells and truly random events. *Journal of Alternative and Complementary Medicine, 10*, 103 – 112.

Renier, N., with Lucks, N. (2005). *A Mind for Murder*. New York: Berkeley Books.

Rhine, L. E. (1967). *ESP in Life and Lab: Tracing Hidden Channels*. New York: Collier Books.

Rogo, D. S. (1974). *An Experience of Phantoms*. New York: Taplinger Publishing.

Roll, W. G. (1972/2004). *The Poltergeist*. New York: Nelson Doubleday/Paraview Special Editions.

Roll, W. G. (1975). Earlier RSPK cases. In J. D. Morris, W. G. Roll, & R. L. Morris (Eds.) *Research in Parapsychology 1974* (pp. 134 – 139). Metuchen, NJ: Scarecrow Press.

Roll, W. G. (1978). Understanding the poltergeist. In W. G. Roll (Ed.) *Research in Parapsychology 1977* (pp. 183 – 195). Metuchen, NJ: Scarecrow Press.

Roll, W. G. (1981). A memory theory for apparitions. In W. G. Roll & J. Beloff (Eds.) *Research in Parapsychology 1980* (pp. 5 – 7). Metuchen, NJ: Scarecrow Press.

Roll, W. G. (1987). Memory and the long body. *Theta, 15*, 10 – 29.

Roll, W. G. (1988). Psi and the phenomenology of memory. In D. H. Weiner & R. L. Morris (Eds.) *Research in Parapsychology 1987* (pp. 131 – 134). Metuchen, NJ: Scarecrow Press.

Roll, W. G. (1989). Memory and the long body. In L. A. Henkel & R. E. Berger (Eds.) *Research in Parapsychology 1988* (pp. 67 – 72). Metuchen, NJ: Scarecrow Press.

Roll, W. G. (1993). Mind and method. In L. Coly & J. D. S. McMahon (Eds.) *Proceedings of an International Conference: Psi Research Methodology: A Re-examination* (pp. 274 – 294). New York: Parapsychology Foundation, Inc.

Roll, W. G. (1994). Are ghosts really poltergeists? *Proceedings of Presented Papers: The Parapsychological Association 37th Annual Convention,* 347 – 351.

Roll, W. G. (1995). Psyche and survival. In L. Coly & J. D. S. McMahon (Eds.) *Proceedings of an International Conference: Parapsychology and Thanatology* (pp. 33 – 55). New York: Parapsychology Foundation, Inc.

Roll, W. G. (2003). Poltergeists, electromagnetism, and consciousness. *Journal of Scientific Exploration, 17,* 75 – 86.

Roll, W. G. (2004). Early studies on psychometry. *Journal of Scientific Exploration, 18,* 711 – 720.

Roll, W. G. (2005). Psi and the long body. *Proceedings of Presented Papers: The Parapsychological Association 48th Annual Convention,* 149 – 161.

Roll, W. G., Maher, M. & Brown, B. (1992). An investigation of reported haunting occurrences in a Japanese restaurant in Georgia. *Proceedings of Presented Papers: The Parapsychological Association 35th Annual Convention,* 151 – 168.

Roll, W. G., Sheehan, L. C., Persinger, M. A., & Glass, A. Y. (1996). The haunting of White Ranch. *Proceedings of Presented Papers: The Parapsychological Association 39th Annual Convention,* 279 – 294.

Roll, W. G., & Persinger, M. A. (1998). Poltergeist and nonlocality: Energetic aspects of RSPK. *Proceedings of Presented Papers: The Parapsychological Association 41st Annual Convention,* 184 – 198.

Roll, W. G., & Storey, V. (2004). *Unleashed – Of Poltergeists and Murder: The Curious Story of Tina Resch.* New York: Paraview Pocket Books.

Schmeidler, G. R. (1973). PK effects upon continuously recorded temperature. *Journal of the American Society for Psychical Research*, 67, 325 – 340.

Schmidt, H. (1982). Collapse of the state vector and psychokinetic effect. *Foundations of Physics, 12*, 565 – 581.

Schwartz, S. A. (1978/2001). *The Secret Vaults of Time: Psychic Archeology and the Quest for Man's Beginnings.* Charlottesville, VA: Hampton Roads Publishing Company.

Schwartz, G. E. R., & Russek, L. G. S. (1999). *The Living Energy Universe: A Fundamental Discovery That Transforms Science & Medicine*. Charlottesville, VA: Hampton Roads Publishing Company.

Sidgwick, E. (1915). A contribution to the study of the psychology of Mrs. Piper's trance phenomena. *Proceedings of the Society for Psychical Research, 28,* 1 – 657.

Stevenson, I. (1970). Telepathic impressions: A review and report of thirty-five new cases. *Proceedings of the American Society for Psychical Research, 29*, 1 – 198.

Tiller, W. A., Dibble, Jr., W. E., Nunley, R., & Shealy, C. N. (2004). Toward general experimentation and discovery in conditioned laboratory spaces: Part I. Experimental pH change findings at some remote sites. *Journal of Alternative and Complementary Medicine*, *10*, 145 – 157.

Tiller, W. A., Kohane, M. J., & Dibble, Jr., W. E. (2000). Can an aspect of consciousness be imprinted into an electronic device? *Integrative Physiological and Behavioral Science, 35*, 142 – 163.

Walker, E. H. (1979). The quantum theory of psi phenomena. *Psychoenergetic Systems*, *3*, 259 – 299.

Walker, E. H. (2000). *The Physics of Consciousness: The Quantum Mind and the Meaning of Life.* Cambridge, MA: Perseus Publishing.

Watkins, G. K., & Watkins, A. M. (1971). Possible PK influence on the resuscitation of anesthetized mice. *Journal of Parapsychology*, *35*, 257 – 272.

Watkins, G. K., & Watkins, A. M. (1974). Apparent psychokinesis on static objects by a "gifted" subject: A laboratory demonstration. In W. G. Roll, R. L. Morris, & J. D. Morris (Eds.) *Research in Parapsychology 1973* (pp. 132 – 134). Metuchen, NJ: Scarecrow Press.

Watkins, G. K., Watkins, A. M., & Wells, R. (1973). Further studies of the resuscitation of anesthetized mice. In W. G. Roll, R. L. Morris, & J. D. Morris (Eds.) *Research in Parapsychology 1972* (pp. 157 – 159). Metuchen, NJ: Scarecrow Press.

Wells, R., & Watkins, G. K. (1975). Linger effects in several PK experiments. In J. D. Morris, W. G. Roll, & R. L. Morris (Eds.) *Research in Parapsychology 1974* (pp. 143 – 147). Metuchen, NJ: Scarecrow Press.

White, R. A. (1976). The limits of experimenter influence on psi test results: Can any be set? *Journal of the American Society for Psychical Research, 70*, 333 – 369.

'DOUBT MARKED' EXPANSION SEQUENCES IN GANZFELD MENTATION REVIEWS

Robin Wooffitt

Department of Sociology
University of York
Heslington,
York, YO10 5DD
UK

ABSTRACT

Conversation analysis (CA) is a formal, qualitative method for the analysis of naturally-occurring interaction. It has been applied to the investigation of the discourse of anomalous experiences, and in the analysis of experimenter-subject interaction in parapsychology experiments. This paper contributes to this latter line of research. A key feature of the CA method is to examine how a turn's design exhibits its producer's tacit understanding of the on-going interaction. This methodological step is illustrated by analysis of data from ganzfeld experiments conducted at the Koestler Parapsychology Unit at the University of Edinburgh. The analysis focuses on two different ways in which experimenters receipt subject communication in the mentation review phase of the experimental procedure. In the review, experimenters go over their record of the subject's prior mentation imagery. After introducing each instance of mentation imagery, the experimenters leave a short gaps before proceeding to introduce the next item in the review. This slot provides an opportunity for the subject to correct the experimenter's record of the mentation, if necessary, or to add further information about their imagery. Routinely, subjects pass on this opportunity to expand upon their prior mentation imagery. However, when they do provide further information about their imagery, this expansion turn is usually receipted by 'okay' from the experimenter, who then moves on to the next mentation imagery. In some cases, though, expansion turns are receipted by 'mm hm' or its variants. In such cases, it is observable that the subject provides further talk about the relevant imagery. However, in various ways, in this further talk the subject exhibits a much more circumspect or cautious stance toward their imagery; for example, there are expressions of doubt about the status of the imagery, or accounts which attribute the imagery to mundane aspects of the environment. It is argued that these doubt marked or circumspect expansion sequences are interactionally generated in that they emerge from the subject's interpretation of the significance of the experimenter's 'mm hm' receipt of their prior talk. The paper concludes by offering some speculative observations on the possible consequences of the different interpretations subjects may draw from these two forms of experimenter receipt. abstract.

INTRODUCTION

It is acknowledged within parapsychology that some experimenters seem to be psi conducive, in that their experiments regularly produce evidence of psi, and others are psi inhibitory, in that they rarely if ever find evidence for psi in laboratory experiments (for example, West, 1954: 150-151; and more recently, Wiseman and Schlitz, 1997). Parapsychologists have consequently wondered what it is that makes some experimenters so successful and others less so.

In an overview of the experimenter effect in parapsychology, Smith (2003) discusses some early work by Pratt and Price (1938) which addresses the issue of rapport. He reports that they tried to assess the impact of the experimenter's interpersonal style. Price seemed to be very good at generating positive results from her experiments. In an ESP experiment they attempted to test if her interpersonal skills effected experimental outcomes. Some participants were treated unfavourably by Price, in that they were not engaged in conversation; and others were treated favourably, in that she did engage in conversation with them before and after the experiment. Smith reports that the experimenters found no significant differences in performance between subjects treated favourably and those treated unfavourably. But he notes that the experimenters reported that the results may have been unilluminating because Price found it hard artificially to induce favourable or unfavourable conditions. However, in other experiments, when Price was not required to be either friendly or unfriendly, she was able to facilitate a relaxed and free conversational environment with the participants.

This points to something interesting about human communication. The competencies we rely on to engage on interaction are tacit: although we are extraordinarily skilful at doing talk, it is very difficult to articulate or reflect on those skills such that we can consciously draw on them to ensure particular kinds of interactional outcomes. This is one of the key reasons why discourse researchers in a range of disciplines emphasise the importance of studying naturally occurring interaction, rather that forms of communication artificially produced in laboratories, or relying on people's intuitions about their communicative skills.

In this paper I explore the properties of tacit interpretative skills which inform communication between experimenter and subject in the mentation review phase of ganzfeld ESP experiments; I try to indicate how these tacit communicative competencies may shape the subsequent trajectory of the review; and finally, I will offer some - admittedly speculative - observations on the way in which a particular interactional phenomenon may have a bearing on the eventual outcome of a ganzfeld trial. The analysis which follows emerged from a broader study of experimenter-subject interaction in parapsychology experiments using conversation analytic techniques.

Conversation analysis and displays of participants' understanding

Conversation analysis (CA) is a formal, qualitative method for the analysis of naturally-occurring interaction. It developed out of the pioneering sociological studies of Harvey Sacks and his colleagues Emanuel Schegloff and Gail Jefferson. In a number of publications, I have argued for the analysis of the discursive dimensions of anomalous experiences (Wooffitt, 1992, 1994, 2005), and for the application of conversation analytic techniques to experimenter-subject interaction in parapsychology experiments more specifically (Wooffitt, 2003; Wooffitt and Allistone, 2005). In these publications I have outlined in detail the analytic perspective and assumptions adopted in conversation analytic research, but it is useful to rehearse in outline the key methodological goals and principles.

Conversation analysis examines the tacit knowledge which informs verbal social interaction, and through which participants establish intelligible, meaningful conduct. As such, it sits at the intersection of linguistics, psychology and sociology. Despite its name, it may be applied to any form of naturally occurring interaction. The data for analysis are recordings of verbal interaction and transcripts which capture the details of spoken communication. CA seeks to show how turns in interaction collectively form highly regular patterns: sequences of interactions. These sequences are taken to be the site in which interpersonal activities are managed collaboratively by participants. Conversation analysis is highly empirical but not experimental. The goal is to produce general claims about the properties of interaction from the close examination of large collections of individual cases. In this, the approach is more like that of the scientific naturalist than the laboratory scientist. (For introductory overviews of conversation analysis, see Heritage, 1984; Hutchby and Wooffitt, 1998; ten Have, 1999; Sacks, 1992).

There is one feature of conversation analytic research which may be of particular interest to parapsychologists. In everyday interaction, the design of a turn - its lexical composition, its placement in a sequence of exchanges, and the way in which it is uttered - will display its producer's tacit understanding of what is happening 'here-and-now' in interaction. It will exhibit the producer's stance towards the topic of talk, their co-interactants, or any other aspect of the context of interaction. To illustrate how turns display the participants' perspective or stance, we can look at some findings from a study of interaction between psychic practitioners, such as clairvoyants, mediums and psychics, and their clients or sitters (Wooffitt, 2006).

In psychic practitioner-sitter interaction, practitioners ask questions which are designed to be heard as implying that they already possess some information about or knowledge of the sitter. Positive responses to these questions which confirm the implied knowledge claim overwhelmingly tend to be produced very quickly after the completion of the claim implicative question. For example:

(1) ('PP' is the psychic practitioner, 'S' is the sitter. The codes indicate the source of the extract in the data corpus. The transcription conventions are explained in the appendix.)

PP: and are you going to the states,
(.)
S: yeah.

(2)

PP: can you understand a gentleman with cancer,
S1: °yes°

(3)

PP: is your brother quite sensitive?
S: yes

However, if the sitter does not say anything immediately after a claim implicative question, the sitters' subsequent turns - usually produced after approximately one second - routinely transpire to be hedged, cautious, or explicitly negative. For example:

(4)

PP: is there a wedding coming up?
(1)
S: not- not to my knowledge

(5)

PP: ˙h w-ho works at computers sally.
(1)
S: Ehrm:: (0.6) I can't think of anybody actually

(6) (This extract comes from a stage demonstration by a medium in a large London theatre, and 'R' designates the respondent from the audience.)

PP: An' is it, er, (.) a child grown up in the spirit world they're telling me,
(1.3)
R: I- (0.3) don't know Doris, (.) no

Whereas positive confirmations are produced without delay, rejections or cautious responses are withheld momentarily. Delayed sitter responses, then, seem to be trouble-implicative.

Given that delayed sitter responses routinely precede sitter disconfirmations, it is not surprising that psychic practitioners will terminate the silence as it approaches the one second duration. But their subsequent turns are interesting in that they try to address what they can now infer to be the sitter's difficulty in accepting the implicit claim in the prior question. In this, these subsequent practitioner turns display their understanding of, and stance towards, the moment-by-moment unfolding of the siting. For example, in cases where mediums are trying to identify people relevant to the sitter, their post-silence turns routinely direct the sitter's or audiences' attention to either spirit or earthly planes.

(7)

PP: yes ˙ h who is Peter?
(2)
PP: Peter living?

(8)

PP: ˙ hhh ah want to say Anne,
(1.3)
PP: Spirit side

Alternatively, post-silence, mediums may offer new names which echo some aspects of the name queried in the topic initiating turn. In the following extract, for example, 'John' preserves the monosyllabic structure and 'o' sound of 'Tom'.

(9)

PP: 'an 'oo is Tommy love, (.) Tom.
(1.2)
PP: ah think ah could be Jo:hn rather than Tom

Psychic practitioners can also amend or revise claim-implicative questions which do not receive immediate confirmations.

(10)

PP: did he have a haemorrhage love,
(0.8)
PP: ora part of him

In this last extract, the psychic's turn, 'did he have a haemorrhage love,' strongly suggests knowledge of the cause of death of the man with whose spirit she is now in contact. There follows a silence of nearly one second, the psychic says 'or a part of him'. This revised version portrays the haemorrhage as a localised problem, and, therefore, less likely to be a fatal condition implied by the initial question. The revised version offers a markedly different order of knowledge claim to that proposed in the first position turn, and is hearably generated out of the psychic's assessment of the significance of the absence of a sitter response.

These observations illustrate the conversation analytic focus on the detail and structure of utterances. By examining the design of psychic practitioners' utterances we can see that they have tacitly interpreted the significance of the absence of an immediate sitter response, and have attempted remedial work to repair what they infer to be some form of problem in the encounter. Their post-silence turns display their tacit understanding of and stance towards the on-going encounter. The analysis of how a turn's design can exhibit its producer's tacit understanding of the on-going interaction can reveal some interesting and possibly significant features of experimenter-subject interaction in laboratory based parapsychological research. To illustrate, we will consider some data from a series of autoganzfeld experiments conducted at the Koestler Parapsychology Unit at the University of Edinburgh.

''OKAY' AND 'MM HM': EXPERIMENTER RECEIPTS OF EXPANSION SEQUENCES IN THE MENTATION REVIEW

There are variations in the autoganzfeld procedure, but, typically, a sender tries mentally to send or project images of a target, usually a short video clip from a large database chosen randomly by specifically modified software. This clip is shown several times during the sending part of the experiment. During the sending period the subject is asked to report verbally whatever images or sensations they are experiencing. These are noted by an overhearing (but at this point, non- participating) experimenter in another room. After the sending period, the experimenter makes contact with the subject (they can communicate via an intercom system and headphones, but are in different rooms) and the mentation review commences. In the review the experimenter goes over his or her notes of the images and sensations reported by the subject during the sending period. During the judging phase which follows, the subject is shown four video clips: the target and three others. On the basis of the images and sensations experienced during the sending phase, the subject has to nominate which clip they think the sender was trying to project.

The rationale behind the mentation review is that it provides the subject with an opportunity to confirm the experimenter's notes of the imagery, or to expand upon their experience during the mentation: to add more information about particular images, to correct the experimenter's mishearings or misunderstandings, and so on. After each item is introduced there is a 'slot' in the interaction in which the subject may speak. This orientation to the purpose of the review, and the kind of subject activity which could occur in this sequential location, is manifest in the way in which the experimenter will momentarily withhold moving directly to the next item. For example, in extract 11, the experimenter withholds moving to the next item for periods between one half and one full second.

(11) (01-47: E1/F. In the remaining data extracts, 'E' is the experimenter, 'S' is the subject. In the data identification codes, the number following 'E' indicates which of the three experimenters taking part is featured in the extract, and the gender of the subject is designated by /F or /M).

E: ˙ hh next an a:pple.
(0.5)
E: and then a ha:nd again.
(0.4)
E: ˙ hhhh a strange face with bulging ey:es and teeth grinning.
(1)
E: next you had the impression of a ^magazine and the
edge of the magazine
(0.6)
E: next a toadstool
(0.8)
E: ˙ h and then an underwater scene,
(0.6)
E: and there were worms heading towards a chest?
S: mm hm

Subjects either pass on the opportunity to speak, for example, by not saying anything after the introduction of each item, or by producing minimal confirmations, such as 'yeah' or 'mm hm', as illustrated in extract 11.

In some case, though, subjects do provide more information. In extract 12, the experimenter introduces the final item of the mentation review. This is immediately confirmed by the subject, who then goes on to offer further information about that item.

(12) (01-21: E3/M)

E: °°˙ (n)hh°° °o:kay,° (tk).˙ hh and then I think the final thing you said was uh:: (.) ˙ h something like a chair (.) >in< in a pyramid?
S: °(n)hh° yeah, >saw the< (.) the triangle thing again and then (.) °.˙ h° >something< which reminded me of like, (.) um, (0.5) ˙ h an upright chair like um:, (1.5) °(n)hhh° (.) um:? >°so-°< like a black chair,

Experimenters may respond in different ways to subjects' production of further information. In the Edinburgh experiments, over 97 individual trials, three researchers took the role of experimenter. In the majority of cases, after the subjects' expansion, the experimenters returned to the stepwise progression through the mentation items. The return to the agenda of mentation items is routinely marked by 'okay' or some variant. For example, in extract 13 we see the experimenter introduce three images reported during the mentation. The subject uses a minimal continuer to pass on the opportunity to expand on the first (the boat in the water), but expands on the second (the pile of plates). The experimenter receipts the expansion with an 'okay' with a questioning intonation, and then introduces the next item (the frog).

(13) (01-05: E3/F)

E: ˙ hh boat=in=the=water=leaving=a=wake,
S: m:m::
(0.6)
E: (tk) ˙ hh a pile of something?
(1.1)
S: >˙ h yeah< it was like a pile of pla:tes or:: ˙ (0.7) um:: (1.1) °something like that°
E: °okay:?° (0.5) ˙ h a fro:g(h) >a big one?<

On occasions, though, experimenters receipt subject expansion in other ways, for example. with minimal utterances such as 'mm hm'. If we continue extract 12 we see that after a gap of 1.4 seconds, this is how this experimenter receipts the subject's further description of the mentation imagery.

(12 continued) (01-21: E3/M)

E: °°˙ (n)hh°° °o:kay,° (tk).˙ hh and then I think the final thing you said was uh:: (.) ˙ h something like a chair (.) >in< in a pyramid?
S: °(n)hh° yeah, >saw the< (.) the triangle thing again and then (.) °.˙ h° >something< which reminded me of like, (.) um, (0.5) ˙ h an upright chair like um:, (1.5) °(n)hhh° (.) um:? >°so-°< like a black chair,
(1.4)
E: m:hm

Non-lexical contributions such as 'mm hm' and 'uh huh' might seem intuitively inconsequential; and it is easy to find instances of social science research papers which use verbal data in which such items are deliberately omitted. But in everyday interaction, though, minimal turns such as these do particular kinds of work. Speakers use them to pass on opportunities in which turn transfer could be initiated, thereby publicly displaying their producer's continued recipiency and passive status within the interaction (Jefferson, 1984; Schegloff, 1981). Thus they can work as 'minimal continuers'. Routinely, minimal continuers are taken to exhibit the expectation that there is more to come in the current speaker's talk. As such, they are resources by which co- participants to interaction can facilitate another's production of an extended turn (such as telling a joke or a lengthy anecdote).

We might then expect these kinds of non-lexical items to occur in the mentation review: it is designed to elicit further information, and we know that minimal continuers are a device to facilitate further talk from a co-participant. It is no surprise, then, to see that this is precisely how they work in the exchange reported in extract 12.

(12 continued) (01-21: E3/M)

E: °°˙ (n)hh°° °o:kay,° (tk).˙ hh and then I think the final thing you said was uh:: (.) ˙ h something like a chair (.) >in< in a pyramid?
S: °(n)hh° yeah, >saw the< (.) the triangle thing again and then (.) °.˙ h° >something< which reminded me of like, (.) um, (0.5) ˙ h an upright chair like um:, (1.5) °(n)hhh° (.) um:? >°so-°< like a black chair,
(1.4)
E: m:hm
(0.5)

S: not like the one I'm sitting on or °anything° jus:::t °uh:° (3.5) >I don't know,< it was >sort of< °uhm:(h)°
(2.1) >like a s-< like a sort of padded chai(hh)r or something °˙ h° >it was just< from the side that I saw it, so
>it was like< an ell shape (.) °.˙ h° [that =
E: [°mhm°
S: = suggested a chair:

However, compare the kind of talk produced in response to the introduction of the mentation item with that turn elicited by the experimenter's minimal continuer. The first is broadly positive: it expands upon and clarifies the original mentation report. But the post-continuer turn is different. The subject seems to adopt a more cautious stance towards their imagery: there are perturbations and hesitations in the speech; and the 'I don't know' formulation is an explicit marker of doubt with regards to certainty or confidence in the subject's reflections on the imagery.

This shift in the speaker's stance or confidence in the imagery is not a unique case. Here is another example, which comes from an earlier stage of the mentation review from which extract 12 was taken. Following the experimenter's minimal continuers the subject's talk is marked by expressions of doubt or hesitation.

(14) (01-21: E3/M)

E: m:hm (0.6) ˙ h °ri:ght° o:kay and then I think the: ˙ h the first regular
impression you had was something like images of a pyramid?
(1.0)
S: yeah:, it's like (0.5) hills or a pyramid °or something°
E: m:h [m
S: [˙ (n)hh uhm hh (.) >everything seems to be like< moving, (0.5) you know, °it wasn't° (.) static
°or anything so it kept° °°>sort of<°°
(.)
E: [mm
S: [˙ h dunno it's just my eyes were moving or::

Note that in the subject's first turn in this extract he confirms the experimenter's report of imagery from the mentation. The subject's confirmation is minimal and fairly positive. The only doubt marker is the phrase 'or something', but this seems to match the implied cautiousness of the experimenter's use of 'something like' to report the subject's mentation imagery.

At the end of the subject's turn the experimenter produces the first of a series of minimal continuers. This is produced in overlap with the subject's in breath and 'uhm'. The subject then goes on to provide additional talk about this imagery, this time focusing on the sense of movement of the imagery. At the end of the second expansion the subject proposes an explanation for this sense of movement: 'dunno it's just my eyes were moving or:::'. So what may have been a feature of the imagery is now attributed to normal causes: minor oscillations of the eye during the mentation phase of the procedure.

What we have, then, is an emerging rationalization of the image in conjunction with another 'dunno' formulation, which explicitly displays the subject's cautiousness with respect to the nature and status of the imagery he had previously experienced and reported. Again, the subject's cautious stance towards his imagery occurs in turns which are elicited by the experimenter's use of minimal continuers.

This phenomenon, albeit sketchily outlined here, seems to be robust. Extracts 15 and 16 provide two more instances from other experimental trials.

(15) (01-31: E3/M)

E: °°m,°° (0.5) °okay,° (0.5) .hhhh (0.4) then you said at one stage feels like it's uh:: °°n-°° >I I< ^thought you
said? something like a rolling uh:, °°mm°°=uh::, ˙ h head? (.) but did you mean like a rolling field?
or:, [°( )°
S: [no:: °a-° I remember at
one (.) point, (0.7) eh::, (1.1) it seemed as if there was somebody rolling over the ground? °˙ hh°
E: m: [hm,

S: [>and,< (0.2) tha:t was when I started (.) thinking about this person ˙hh
E: [mhm,
S: [°and° (0.3) it was as if he was: like? (1.1) °hh° he was rolling over towards::
°°°>uh<°°° a kinda? ˙hhh wee (.)°°u°°=hi:ll or lump or something in the ground and then? °˙hh°
°almost° like burrowing under it
(1.3)
E: m:°hm°
(1.0)
S: °°e:h it-°° °>it was all very,<° it was very kinda, i- (.) you know, (0.7) indistinct but, °u° (.) that was the >kind of feeling that I was getting,

Here the subject's first turn corrects the experimenter's report of the mentation imagery, and over a period of several lines, the subject provides substantial further information on the item. At that point the experimenter offers another minimal continuer in the clear of the subject's talk, (after a 1.3 second gap) and after the subject had arrived at a turn completion. Note that the experimenter's minimal continuer again elicits further information and that in the first components of this turn the subject explicitly describes how indistinct the imagery was. He then characterises his understanding of the imagery as a feeling, which markedly downgrades the expressed or implied certainty compared to the immediate report in response to the experimenter's introduction.

(16) (01-28: E2/F)

E: and you said you felt you could see for mi:les (.) across countryside,=
S: =yea°f-s°, ( ) ˙hh like I was flying across it
(0.5)
E: (h) m^hm
S: ˙hh looking down over ( ) ˙hhh hhh fields a- >I don't know:< it was very odd hh yeah,
E: °m°^hm
S: °°˙hhhh hhhh°°
(0.3)
S: (°mus:-°) >I'd-< ^hh (.) ˙h ^I'M NOT VERY GOOD AT DESCRIBING IT it's a very wierd >sort of<
va:gue (.) ˙hh (1.2) >°it°< just felt like (>sort of you<) so::: (0.3)) ˙hh body's just: (1.2) taking off

There is an intriguing pattern emerging which is further illustrated in extract 16:

- experimenter introduction of mentation item
- affirmative expansion
- experimenter minimal continuer
- subject's further talk on item now marked by hesitation, caution, etc: in extract 16 the subject explicitly reports - and at a volume louder than preceding talk - ^I'M NOT VERY GOOD AT DESCRIBING IT'.

We know from studies of ordinary conversational interaction that minimal continuers display their producer's understanding that there is 'more to come' in a co-participant's talk. We would expect them to generate further talk in the interaction during the mentation review. But why do they generate this kind of talk, in which speakers, in various ways, express doubt hesitation or uncertainty about their imagery?

In the context of an experimental situation, the subjects seem to hear experimenter's minimal continuers produced in the clear of on-going talk and after the subject has ended their current turn as exhibiting the experimenter's understanding that their prior expansion was somehow inadequate or accountable. So for example, they may downgrade the epistemological status of the imagery by displaying uncertainty or cautiousness about what the image really was; or they may seek to attribute the imagery to routine or normal causes, such as the bodily sensations arising from their experience of the physical location of the experiment.

It is unclear at this stage of the analysis, though, why expansion turns receipted by minimal continuers should generate this kind of talk; this issue is the focus of on-going research.

CONCLUSIONS

Why is this relevant to parapsychology? I will raise three issues. After the review in ganzfeld studies the subjects go to the judging phase of the experiment. They will see four video clips and will be asked to identify which of these they think the sender was concentrating on. During this process it is assumed that subects rely on their imagery to guide them in deciding which of the four clips was the focus of the sender's attention. But if the interaction between experimenter and subject during the review is organised such that it encourages subjects to express their doubt or uncertainty about their imagery, it is at least possible that they will have less confidence in relying on their imagery to identify significant events or themes in the video clips. Their decision as to what they think the target is may well be influenced by their tacit awareness of the stance they adopted towards their imagery - a stance which was not initially exhibited in their expansion in response to the introduction of that mentation item, but which seems to have been interactionally generated in the way that expansion was subsequently receipted by the experimenter.

Parapsychologists are interested in what it is that makes some experimenters successful and others less so; and this in turn hinges on identifying relevant differences between experimenters, in their personality, expectations, commitment to psi, or interpersonal relationships with subjects. CA identifies robust sequential phenomena - highly patterned sequences of interaction - and this may provide ways of marking differences between experimenters. Take the use of minimal continuers we have identified here, and the way they seem to elicit doubt or hesitation marked responses. For the sake of argument we can call this a doubt marked expansion sequence (although it is likely that as our understanding of this phenomenon develops we may require a different term). Preliminary inspection suggests that it is not common throughout the corpus of the KPU ganzfeld trials. We can ask, then, where does it occur? Is it evenly distributed across the experimenters, or is do some experimenters produce more doubt marked expansion sequences than others?

Finally; and suggestively: this discussion of the possible effects of interactional practices on experimental outcome is speculative because the analysis of the interaction in the mentation review was undertaken without knowledge of result of the subsequent judging phase, nor indeed, access to the recording of the judging phase. It has not yet been possible, then, to assess relationships between the use of minimal continuers and doubt marked expansion sequences and subsequent performance in the judging phase. However, in the KPU experiments, the role of experimenter was taken by three members of the Unit's staff. The results showed that one of the experimenters seemed very successful at getting positive results; and one experimenter seemed noticeably poor. The instances of doubt marked expansion sequences examined in this paper cluster in trials conducted by the experimenter who, it later transpired, was relatively unsuccessful at generating positive results. This suggests that conversation analytic research on discourse in parapsychological experiments may be able to identify the properties of experimenter-subject interaction associated with successful or unsuccessful experimental outcomes. This does not necessarily mean that we can unproblematically identify patterns of communication which facilitate or inhibit psi; it may be the case that ostensibly successful outcomes of parapsychological experiments transpire to be the result of as-yet unexplored demand characteristics of the laboratory setting (Orne, 1962; Orne and Bauer-Manley, 1991). Conversation analytic techniques, though, can assist in discovering and exploring the consequences of variations of experimenter communication in parapsychology laboratory research, regardless of the ultimate cause of that variation.

ACKNOWLEDGEMENTS

I would like to acknowledge the help and assistance of the late Professor Robert Morris and his colleagues at the KPU in providing data for this project. The work reported in this paper was supported by a grant from the Bial Foundation (Portugal), and I am grateful for their generous assistance. I am also grateful for the comments from two anonymous referees.

APPENDIX: TRANSCRIPTION SYMBOLS

The transcription symbols used here are common to conversation analytic research, and were developed by Gail Jefferson. The following symbols are used in the data.

(.5) The number in brackets indicates a time gap in tenths of a second.
(.) A dot enclosed in a bracket indicates pause in the talk less then two tenths of a second.
˙hh A dot before an 'h' indicates speaker in-breath. The more h's, the longer the inbreath.
hh An 'h' indicates an out-breath. The more 'h's the longer the breath.
(( )) A description enclosed in a double bracket indicates a non-verbal activity. For example ((banging sound))
\- A dash indicates the sharp cut-off of the prior word or sound.
::: Colons indicate that the speaker has stretched the preceding sound or letter. The more colons the greater the extent of the stretching.
( ) Empty parentheses indicate the presence of an unclear fragment on the tape.
(guess) The words within a single bracket indicate the transcriber's best guess at an unclear fragment.
. A full stop indicates a stopping fall in tone. It does not necessarily indicate the end of a sentence.
Under Underlined fragments indicate speaker emphasis.
^ | Pointed arrows indicate a marked falling or rising intonational shift. They are placed immediately before the onset of the shift.
CAPS With the exception of proper nouns, capital letters indicate a section of speech noticeably louder than that surrounding it.
° ° Degree signs are used to indicate that the talk they encompass is spoken noticeably quieter than the surrounding talk.
°° °° Double degree signs have been used to indicate whispered or extremely quiet talk.
Thaght A 'gh' indicates that word in which it is placed had a guttural pronunciation.
> < 'More than' and 'less than' signs indicate that the talk they encompass was produced noticeably quicker than the surrounding talk.
= The 'equals' sign indicates contiguous utterances.

[
] Square brackets between adjacent lines of concurrent speech indicate the onset and end of a spate of overlapping talk. For example:

```
S2    yeah September [seventy six=
S1                   [September
S2    =it would be
S2    yeah that's right
```

A more detailed description of these transcription symbols can be found in Atkinson and Heritage (1984: ix-xvi).

REFERENCES

Atkinson, J.M. and Heritage, J. (Eds.) (1984). *Structures of Social Action: Studies in Conversation Analysis.* Cambridge: Cambridge University Press.

Heritage, J. (1984). *Garfinkel and Ethnomethodology*. Cambridge: Polity Press.

Hutchby, I. and Wooffitt, R. (1998). *Conversation Analysis: Principles, Practices and Applications*, Oxford: Polity Press.

Jefferson, G. (1984). Notes on the systematic deployment of the acknowledgement tokens "yeah" and "hm mm". *Papers in Linguistics, 1*(7) 197-206.

Orne, M. T. (1962). On the social psychology of the psychological experiment: with particular reference to demand characteristics and their implications. *American Psychologist, 17*, 776 -783.

Orne, M.T. & Bauer-Manley, N.K. (1991). ‘Disorders of self: myths. metaphors and the demand characteristics of treatment’ in J. Strauss and G.R. Goethals (eds.) *The Self: Interdisciplinary Approaches*. New York: Springer-Verlag. (pp. 93 -106).

Pratt, J.G. & Price, M.M. (1938). The experimenter-subject relationship in tests for ESP. *Journal of Parapsychology*, *2*, 84-94.

Sacks, H. (1992). *Lectures on Conversation.* Volumes I and II, edited by G. Jefferson and E. A. Schegloff, Oxford and Cambridge, Mass.: Basil Blackwell.

Schegloff, E A. (1981). Discourse as an interactional achievement: some uses of "uh huh" and other things that come between sentences in D. Tannen (ed.) *Analysing Discourse: Georgetown University Roundtable on Languages and Linguistics*. Washington D. C.: Georgetown University Press (pp. 71-93).

Smith, M.D. (2003). The role of the experimenter in parapsychological research. *Journal of Consciousness Studies*, Special Edition: Psi Wars, edited by J.Alcock, J. Burns and A. Freeman, *10* (6-7), 69-84.

Ten Have, P. (1999). *Doing Conversation Analysis: a Practical Guide*. London and Thousand Oaks: Sage.

West, D. J. (1954). *Psychical Research Today*. London: Penguin.

Wooffitt, R. (1992). *Telling Tales of the Unexpected: the Organisation of Factual Discourse*. Hemel Hempstead: Harvester Wheatsheaf.

Wooffitt, R. (1994). Analysing verbal accounts of spontaneous paranormal phenomena: a sociological approach. *European Journal of Parapsychology 10*, 45-63.

Wooffitt, R. (2003). Conversation analysis and parapsychology: experimenter-subject interaction in ganzfeld experiments. *Journal of Parapsychology, 67*, 299-324.

Wooffitt, R. (2005) Language and the study of parapsychological phenomena in M. A. Thalbourne and L. Storm (eds.*) Parapsychology in the 21st Century : Essays on the Future of Psychical Research*. North Carolina and London: McFarland (pp. 305-336).

Wooffitt, R. (2006). *The Language of Mediums and Psychics: the Social Organisation of Everyday Miracle*s. Aldershot: Ashgate.

Wooffitt, R., and Allistone, S. (2005). Towards a discursive parapsychology: language and the laboratory study of anomalous communication. *Theory and Psychology, 15*(3), 325-355.

THE SOCIAL ORGANIZATION OF TROUBLE MANAGEMENT IN PSYCHIC PRACTITIONER - SITTER INTERACTION: THREE DISCURSIVE STRATEGIES

Robin Wooffitt

Department of Sociology
University of York
Heslington
York YO10 5DD
UK

ABSTRACT

This paper presents some findings from a conversation analytic study of interaction between psychic practitioners and their clients, or sitters. As its point of departure, it acknowledges Morris' (2005) argument that it is important to examine the social context of claims to parapsychological cognition. In this, it offers a contribution to our understanding of the ways in which participants in psychic-sitter interaction can establish and sustain the sense that genuine parapsychological ablities are being demonstrated. This is not, however, an exercise in cold reading. However much sceptics (or indeed, psychcis) may wish to appropriate the results of convesation analytic reseach on psychic-sitter interaction to support their position, the analyses themselves are ultimately agnostic as to the truth status of the claims of psyhic practitioners. That is, instead of trying to identify a set of objective criteria by which scientists or academic researchers can arbitrate on the validity of claims of paranormal powers, or the objective existence of the spirits, conversation analytic techniques allow us to investigate the sense-making practices through which psychic practitioners and their clients themselves negotiate, ratify, clarify, question or reject the status of paranormal knowledge claims as they manage the routine discursive activities of the consultation or demonstration. The empirical sections of the paper examine three kinds of remedial or repair strategies by which psychic practitioners and their sitters work to sustain the authority or authenticity of the practitioners in situations where their genuiness may be questioned or their claimed parapsychological abilities disconfirmed. The first is available to psychics. If a claim or prediction about the sitter is not accepted or confirmed, a psychic may simply abandon that topic, and then move on to another topic. But this can be an inferentially risky strategy, in that a swift progression on to another topic or claim about the sitter might be the basis upon which a sitter infers that the psychic is merely engaged in guessing, rather than using some form of parapsychological cognition. However, there is a strategy by which psychics can introduce a new topic - known as 'and prefacing' - which minimises the likelihood of a sceptical interpretation by the sitter. The second and third strategies are available to sitters. They can either modulate or 'soften' their negative or disconfirmatory responses to the psychic's prior prediction or claim. Alternatively, they can engage in a form of embedded or unmarked correction in which the activity of correcting does not become an explicit focus of the exchange. The paper concludes with some critical refections on the relatively unsophisticated account of psychic practitioner- sitter communication advanced in the cold reading literature.

INTRODUCTION

One area of parapsychological research promoted by the later Professor Robert Morris and his colleagues at the Koestler Parapsychology Unit was the investigation of 'what's not psi but looks like it' (for example, Roe, 1995; Wiseman and Morris, 1995a, 1995b). Much of this research has concerned psychic claimants: people who profess to have some form of parapsychological cognition, such as the ability to communicate with the dead, and other forms of psychic abilities. Morris (2005, originally 1990-1991) described this project as involving, among other things, analysing 'the social context of the claim and its negotiation and acceptance in the interactions among claimants and their evaluation' (Morris, 2005: 25, italics added). In short: what are the features of consultations between psychics and their sitters, or demonstrations to audiences, which facilitate the sense that genuine parapsychological cognition has occurred?

A conversation analytic perspective on psychic-sitter interaction can contribute to this project (Wooffitt, 2003a). There is now a cumulative body of findings about the organisation of interaction in everyday and institutional settings, and this provides a valuable resource when we try to understand the activities of psychic practitioners and their clients, especially those verbal activities which seem to bear on the issue of the practitioner's authenticity and credibility.

In this paper, I will discuss three kinds of remedial or repair strategies by which psychic practitioners and their sitters work to sustain the authority or authenticity of the practitioners in situations where their genuiness may be questioned or their claimed parapsychological abilities disconfirmed. The first is available to psychics. If a claim or prediction about the sitter is not accepted or confirmed, a psychic may simply abandon that topic, and then move on to another topic. But this can be an inferentially risky strategy, in that a swift progression on to another topic or claim about the sitter might be the basis upon which a sitter infers that the psychic is merely engaged in guessing, rather than using some form of parapsychological cognition. However, there is a strategy by which psychics can introduce a new topic - known as 'and prefacing', which minimises the likelihood of a sceptical interpretation by the sitter. The second and third strategies are available to sitters. They can either modulate or 'soften' their negative or disconfirmatory responses to the psychic's prior prediction or claim. Alternatively, they can engage in a form of embedded or unmarked correction in which the activity of correcting does not become an explicit focus of the exchange.

Within the parapsychological literature, it is common to find the term psychic claimant employed to refer to mediums, psychics and so on (for example, see the quote from Morris 2005, above; and Wiseman and Morris, 1994, 1995). Equally, it is common to find the term pseudo psychics used to refer to people who claim some form of special powers while actually employing trickery (for example, Roe, 1995; Smith and Wiseman, 1992/1993). First, then, an issue of terminology: why adopt the term psychic practitioners? Discussion of this issue allows me to establish the wider methodological principles of the analytic method adopted in the subsequent empirical sections of the paper.

TERMINOLOGICAL ISSUES AND METHODOLOGICAL PRINCIPLES

There are several reasons why we might refer to people who profess special cognitive powers as psychic practitioners. Given the range of paranormal skills on offer in the occult market place, it would be clumsy to list them all every time a general analytic claim is made. Furthermore, some practitioners can not be identified in relation to a specific parapsychological ability, as they offer a range of different services. Moreover, the goal of this kind of analysis is to describe generic communicative competencies which inform demonstrations of all psychic practitioners, regardless of the distinctive kind of special cognitive ability they profess.

Perhaps most important though: the use of the terms 'psychic claimant' or 'pseudo psychic' reflects the concern of parapsychologists and sceptics alike to assess the evidence for claims to have some kinds of parapsychological cognition. However, I am not interested in trying to discover if psychic practitioners really have special powers, nor to endorse practitioners' claims that they have access to paranormally derived knowledge; neither does the analytic approach adopted here seek to debunk those claims: it is agnostic as to the existence of the paranormal powers claimed by psychic practitioners in their demonstrations.

In this, we can make a distinctive methodological and substantive contribution to parapsychological and sceptical investigation of people who claim psychic powers. So, as an alternative to the overriding focus on the ultimate objective existence of psychic powers, we can examine those practices through which such claims are managed by participants in the settings in which they are exhibited. And to complement the testing of psychics in the artificial environment of the laboratory, we can try to understand the social organisation of demonstrations of psychic powers in real-life, everyday settings.

The term 'psychic practitioner' also reflects the perspective on language and communication adopted in this study. In the past forty years, and across a range of cognate disciplines, there has been a sustained argument that language use is a form of social action, the dynamic and stuctural properties of which are independent of psycholgical and sociological variables. Within the social sciences, investigation of the action orientation of language is mainly associated with the analysis of naturally occurring interaction known as conversation analysis

(CA). The method of conversation analysis and its relevance to parapsychology has been outlined elsewhere (Wooffitt, 2003a, b). Consequently, it is necessary here to offer only a brief outline of the approach.

Conversation analysis examines the communicative competencies which inform ordinary, everyday talk-in-interaction. The goal of CA is to describe the actions which are accomplished through the design of utterances, and it examines how these actions are produced with respect to the sequences of exchanges in which those actions are performed (Atkinson and Heritage, 1984; Hutchby and Wooffitt, 1998; Sacks, 1992; ten Have 1999). The empirical analyses presented later in this paper reflect the concerns of conversation analysis, in that they examine some properties of communicative activities through which claims of parapsychological cognition are advanced and received.

THE SEQUENTIAL ORDER OF PSYCHIC PRACTITIONER-SITTER INTERACTION

The discourse of psychic practitioners exhibits some robust sequential properties. One very common feature is that they ask questions which are designed in such a way as to imply that they already posses some knowledge about the sitter or their circumstances. If this implied claim is confirmed or accepted by the sitter, that now-ratified knowledge is attributed to a paranormal source, thereby retrospectively establishing its status as a prediction or claim about the sitter. The turn-by-turn basis of this attributive sequence can be summarised as

Turn 1 Psychic: a question implying a claim about, or knowledge of, the sitter, their circumstances, etc.
Turn 2 Sitter: minimal confirmation/acceptance
Turn 3 Psychic: attribution of now-confirmed knowledge claim to a paranormal source

The following instances were analysed in an earlier paper (Wooffitt, 2003b), but it is useful to review that analysis to set the context for the subsequent analyses, and to illustrate the broad characteristics of a conversation analytic approach to psychic-sitter interaction. In each extract, claims confirmed by the sitter are subsequently attributed to a paranormal source: in these cases. either the presence of the spirit, or the spirit's words reproduced as reported speech (and indicated by the use of conventional speech markers).

(1) ('PP' is the psychic practitioner, 'S' is The sitter. Transcription symbols are explained in the appendix.)

```
T1   M:    with you. ˙hh number one thing is your >mother in spirit
           please?<
           (0.2)
T2   S:    Yes
T3   M:    >'cause I have (n-m) y'r mother standing right over here,
           ˙hh and she said "I WANna TAlk to HEr and I want to speak
           to her" because ˙hh your mother has very lou::d when she
           comes through. ˙h she speaks with a=in a very lou:d way
```

(2) (In this extract there are two sitters, S1 and S2.)

```
T1   PP:   >'ave you 'ad< (.) bit >(o')< trouble with your back as well.
           (0.2)
T2   S1    yes a little bi     [t
T3   PP:                       [he says "ah'd best send her a bit of sympathy down"
           so you understand it,˙hh   [h
     S1                               [ye      [s
T1   PP:                                       [coz  y'know ˙h y'try to bottle things
           up and you don't always let people get close to you in that    sense do you
T2   S1    no.
T3   PP    he says "she can be quite stubborn at times y'know"
           (.)
```

	PP:	is that true
	S1:	°yes°
T1	PP:	an' he knows cz ˙ h you are fussy about the bungalow aren't you [girl
T2	S1:	[Yes I am
T3	M:	“bless” her he says

Successful demonstrations of parapsychological cognition - that is, where the sitter accepts or confirms the implied knowledge claim and the psychic then invokes its paranormal source - are obviously crucial in sustaining the sense that the practitioner has real powers.

If, however, the psychics’ claims are incorrect and rejected, their credibility is challenged, and these moments have to be managed. There are various discursive practices which psychic practitioners can draw upon to minimise the negative inferential impact of an ostensibly incorrect claim (Wooffitt, 2006). But their clients or sitters can also draw upon discursive resources to facilitate a smooth negotiation of those moments when the psychic’s powers seem to be disconfirmed. However, these are not necessarily unique to psychic-sitter communication, but reflect norms and expectations which also inform everyday interaction.

‘AND-PREFACING’ AND TOPIC ABANDONMENT

If a claim implicative question does not receive an immediate and positive confirmation, and the subsequent silence extends to the point at which the psychic can infer that it anticipates a negative response, a trouble management practice is simply to abandon that topic and launch a new one. There are positive benefits from abandoning what can be anticipated to be rejected knowledge claims. New claim implicative questions offer fresh opportunities to demonstrate extraordinary cognitive powers. In the following case, for example, the question ‘an' are y' changing a ca:r,’ receives an unequivocally negative response. The sequence projected by this candidate first turn is immediately abandoned and the psychic produces another question on an unrelated topic. This stands as a candidate first turn in a projected attributive sequence. This second implied knowledge claim generates a positive albeit cautious and delayed response, thus leading to an attributive turn in which the now-confirmed claim is attributed implicitly to the psychic’s paranormal means of cognition.

(3)

PP:	˙ h an'are y' changing a ca:r,
	(0.4)
S:	No [:.
PP:	[and is your da:d, (0.2) 's your dad ehm, (0.8) generous?
	(1)
S:	ca:n be.=
PP:	=okay, ˙ h well I feel ja- your dad is showing you generosity, ˙ h but I would say to you. (0.3) there's going to be somebody else very generous around'juh

Abandoning on-going topics, however, raises a number of inferential difficulties. Simply jettisoning implied knowledge claims which seem to be unsuccessful might invite a sceptical interpretation of the authenticity of the medium’s or psychic’s powers. However, there are design features of practitioners’ turns which work to minimise the sense that they are simply moving to a new topic once there are grounds to infer that an on going topic is likely to be met with a negative response.

In extract 3 the first component of the (soon to be) abandoned knowledge claim, and the one that follows it, is ‘and’ or its contraction ‘an’’.

PP:	˙ h an'are y' changing a ca:r,
	(0.4)

S: No [:.
PP: [and is your da:d, (0.2) 's your dad ehm, (0.8) generous?

Here is another example, taken from a stage demonstration of mediumship. Here the turn which begins with ‘and’ follows the question ‘Who’s Mary’ and a trouble implicative silence.

(4)

PP: he said, "I'm Bill" and then your father had also
cancer of the lung. ˙ hhh ((coughs)) yes, just a minute darling
just a minute=˙ hhhh d-who's Mary?
(2.3)
PP: ˙ hh and who lived at number seventeen.

Beginning turns with ‘and’ is called ‘and-prefacing’. And-prefaced questions are quite common in mediums’ and psychics’ discourse, although it is a discursive practice common to some practitioners more than others. And-prefacing does not always occur in turns which introduce new knowledge claims immediately after a rejected and abandoned claim; but it may have some particular function when it is used in this context.

And-prefaced questions also occur in interaction that occurs in institutional or work contexts, such as medical encounters and courtroom cross-examinations (Atkinson and Drew, 1979; Drew and Heritage, 1992). We can learn about their use in psychic-sitter interaction by considering a study by Sorjonen and Heritage which examined the properties of and-prefaced questions in meetings between health care visitors and women who had just recently given birth (Sorjonen and Heritage, 1991).

Sorjonen and Heritage found that and-prefaced questions occur in a series of question-answer sequences, and they they routinely receive minimal, one word answers. Already, we can see that there are similarities with the context in which they occur in psychic-sitter interaction. Furthermore, Sorjonen and Heritage observed that after the production of a minimal preferred response, the questioner's next turn will be another and-prefaced enquiry. This next question will exhibit only a minimal acknowledgement of the prior answer (such as 'uh huh' or 'okay'), and move the interaction to a next topic or issue. So, the next and-prefaced question treats the prior answer as sufficient or unproblematic: as not requiring, for example, clarification or confirmation. Each and-prefaced question constitutes a 'forward movement within the trajectory of a larger sequence' (Sorjonen and Heritage 1991: 64). In this sense, the use of and-prefaced questions establishes that sense that each question is merely one of a pre-existing series of questions:

...if proceeding to a 'next' question acknowledges the sufficiency of a prior answer, the 'and-prefacing' of that 'next' question...does particular work in constituting its relation to the prior question. Specifically it constitutes its status as a 'next' question in a 'line' or 'agenda' of issues or topics. As a socially constructed object, this 'line' is understandable as a pre-existing agenda of questions. As an interactional object it is on-goingly established and sustained with each next and-prefaced enquiry. It is this agenda-based 'nextness' between non-adjacent actions which we regard as the major task of and-prefacing. (Sorjonen and Heritage, 1991: 64.)

In extracts 3 and 4 the practitioners produce and-prefaced topic initiating questions, thereby constituting those topics as successive items in a pre-established agenda of related knowledge claims which they are progressively working through. This provides an inferential framework which rationalises the pursuit of a new topic. It is not that the introduction of a new knowledge claim is an ad hoc response to contingencies in the sitting or demonstration (namely, the sitter’s/respondent’s actual or anticipated negative response), but the routine working through of a pre established agenda of topics relevant to the sitter.

MODULATED SITTER DISCONFIRMATIONS

When presented with implied knowledge claims which seem to have little personal relevance, sitters rarely offer unequivocal rejections. Instead, they tend to offer responses which, in various ways, do not topicalise and focus on what could be interpreted as an error on the part of the psychic; or which allow for the possibility that the psychic's implied claim could be correct.

So: negative responses may be mitigated in various ways. In extract 5 the psychic implies that someone known to the sitter is pregnant

(5)

PP: who's pregnant around you?
S: nobody that I know of.
PP: You're going to hear about somebody that's got pregnant,
unmarried as well,

'Nobody that I know of' suggests that the absence of a positive response is down to the limitations of the sitter's knowledge. This clearly allows for the possibility that the psychic may be correct, an assumption developed by the psychic in the subsequent turn. A further example is provided in the following extract.

(6)

PP: is there a wedding coming up?
(1)
S: not- not to my knowledge

This kind of response establishes the sitter's epistemic doubt, in that it suggests the contingent and potentially defeasible nature of the sitter's basis for not accepting the psychic's prior claim.

Even when sitters do go on to produce an unequivocal rejection of the psychic's implied claim, such as 'no', epistemic doubt formulations may be offered first, thereby modulating the degree and severity of the rejection.

(7)

PP: An' is it, er, (.) a child grown up in the spirit world they're telling me,
(1.3)
S: I (0.3) don't know Doris, (.) no.

In this extract, the pratitioner's turn is unusual, in that it is a statement, not a question; and it identifies a paranormal source - in this case, the spirits - prior to the confirmation by the respondent. But most significant, it makes a highly distinctive claim about the respondent: that she knows of a child who died. But even when confronted with such a specific claim, about which we might expect a respondent to show little uncertainty, the eventual rejection is mitigated by an epistemic doubt formulation.

Extract 7 suggests that sitters and respondents may produce mitigating epistemic doubt formulations, even when there is good evidence of their 'expert' status with respect to the knowledge claim implied by the psychic's prior turn. This is particularly clear from the following extract. Prior to the interaction in this extract, the practitioner has established contact with the spirit of the sitter's dead husband. In this section the practitioner is describing a feature of the husband's personality when alive, and then goes on to make a claim about the sitter's behaviour in response to these features of her husband's personality.

(8)

PP: hh ahm I feel at times that your husband could be very serious (.) he could be very serious sometimes very-
c'd be very serious ˙h like his mind worked in a way where ˙h he was very serious and rigid about certain
ways of believing, (.) and you kinda like
hadduh (.) crack him up a little bit and make make
laughter make light of some situations.
S: MMmmm I do [n't think so= [so much.]
PP: [(th-) =th[e opposite,]>the opposi[te.<
S: [Yes=

Here the sitter responds negatively, albeit cautiously, to the suggestion that, in her relationship with her husband, it was she who tended to 'make light of some situations'. There is evidence that this claim is not merely an inaccurate description of the relationship, but completely wrong: during the sitter's turn the psychic says 'the opposite' twice (the cut off 'th-' in overlap with the sitter's 'don't' is likely to be yet another launch at 'the opposite'), which receives an emphatic minimal confirmation. Yet even when initially responding to a claim about her life with her husband which transpires to be entirely false, the sitter produces a modulated formulation 'MMmmm I don't think so so much', rather than an flat, unequivocal 'no'.

Why do sitters produce epistemic doubt markers, when there is evidence to suggest that they are aware that the practitioner's claim is entirely incorrect?

In everyday interaction, it is common for speakers to employ epistemic doubt marker to attend to potentially delicate interpersonal matters. For example, the following extract comes from a corpus of telephone conversations.

(9) (From Atkinson and Drew 1979: 58)

B: Uh if you'd care to come over and
visit a little while this morning
I'll give you a cup of coffee
A: hehh Well that's awfully sweet of you,
I don't think I can make it this morning
hh uhm I'm running an ad in the paper and and uh I
have to stay near the phone.

B invites A round for coffee. In declining this offer, A does not issue a blunt refusal, but employs an epistemic doubt formulation 'I don't think I can make it this morning', which modulates the strength of the refusal, in that it portrays the uncertain or conditional basis of the action. As such, A's turn handles sensitive issues concerning the face of the person making the invitation (Heritage, 1984: 265-280). It is designed to minimise interpersonal disharmony.

Conversation analytic studies of various forms of talk-in-interaction suggest that there is a normative orientation to minimising interpersonal harmony in the production of broadly negative or disaffiliative activities such as corrections, rejections of offers or invitations, and disagreements with assessments (Davidson, 1984; Pomerantz, 1984; Schegloff, 1992; Schegloff et al, 1977). The data presented in this section suggest that this normative orientation also informs the sitter's conduct in consultations with psychics and mediums.

EMBEDDED OR UNMARKED REPAIR

This orientation to normative expectations also operate in the ways in which sitters deal with psychics' incorrect claims.

To illustrate, consider the following extract, which comes from the transcript of a stage demonstration of mediumship in a large London theatre. The medium is referring to the employment of a member of the audience after he served in the Second World War.

(10) (‘R’ is the respondent in the audience.)

PP: are you in insurance now
(.3)
S: I have been
PP: ((laughing)) I said “What’s he been doing since he came out of the mob like?” (0.8) an he said “Oh, insurance, y’know.”

The medium’s question implies that she knows about the respondent’s current employment. ‘I have been’ however, reveals that he used to be in insurance, and, by implication, is no longer. The respondent’s turn thus reveals that the medium’s claim is incorrect. However, the sitter does not draw attention to the error, but merely offers a correction. This correction is then incorporated into the medium’s next turn in such a way that she can account for her error. She recites a conversation with her spirit source, and it is presented as having happened prior to the moment in which it is rehearsed in the demonstration. This establishes that whatever passed between medium and spirits happened before the respondent’s disclosure about having been in insurance.

The respondent’s utterance is a form of unmarked correction, in that it occurs in the absence of talk in which it is noted that correction is occurring, or in which the participants’ status as corrector or corrected becomes topicalised. In this sense it has similar properties to embedded correction found in ordinary conversation.

Jefferson (1987) described two forms of conversational correction. In exposed correction, one speaker will explicitly design a turn to be seen to be correcting another; this means that the error momentarily becomes the topic of the interaction. For example:

(11) (From Jefferson, 1987:87.)

Larry: They're going to drive ba:ck Wednesday.
Norm: Tomorrow.
Larry: Tomorrow. Right

In this extract Larry simply gets the day of a journey wrong. The error is subsequently exposed by Norm in a turn which does correction and no other activity. This explicit correction is acknowledged by Larry in his next turn via a repeat and conformation of the correct day.

This kind of explicit correction can be a potentially sensitive matter, in that it implies some (albeit possibly minor) lapse of competence on the part of the corrected party. In embedded correction, however, the activity of correcting is not topicalised, but is accomplished in the course of the interaction.

Jefferson begins analysis of embedded correction by noting some properties of cases in which speakers make consecutive reference to the 'same' object or state of affairs by using alternative items. For example:

(12) (From Jefferson, 1987:93.)

Ken: Well-if you're gonna race, the police have said to us.
Roger: That makes it even better. The challenge of running from the cops!
Ken: The cops say if you wanna race, uh go out at four or five in the morning on the freeway...

Here, Ken says 'police', Roger says 'cops', and then Ken says 'cops' also. Jefferson notes other examples of this pattern and states that ‘Over and above sheer consecutive reference, then, it appears that when a next speaker produces, not a proterm or a repeat, but an alternative item, correction may be underway’ (Jefferson, 1987:93).

In cases of embedded correction the activity of repair is accomplished in the course of the interaction, and does not lead to repair per se becoming the focus for the exchange. This ensures that the smooth trajectory of the exchange is preserved. Furthermore, in cases of exposed correction the repair is accompanied by instructings, queryings, and the like, which specifically address lapses in competence. But embedded corrections permit of no place for such explicit accountings, and issues concerning the speaker's competence are not raised. This means that the issue of the speaker's competence does not become the focus of the participants' interaction. In this sense, embedded correction is a device which works to preserve interpersonal harmony.

In extract 10, the audience respondent's utterance 'I have been' accomplishes a form of embedded correction. It identifies the error in the practitioner's prior turn, thereby allowing the practitioner to incorporate what is now revealed to be correct information into her subsequent turns. Moreover, her lapse of competence is not exposed, and an error what could inform a sceptical assessment of her authenticity is handled implicitly in the unfolding of the interaction.

Here is another example. This comes from a one-to-one sitting with a psychic recorded at a psychic fair. The psychic is talking about the sitter's boyfriend and his attitude towards her college studies.

```
(13)    (Simplified transcription.)

PP:     he's not (.) fussed about it c's he doesn't really understand why
        it's so   important to you
        (0.4)
S:      ri:ght (0.5) right.
        (0.2)
PP:     (>I think-<) (0.4) does he work with his ha:nds,
        (0.6)
S:      He works in computer drawing.
        (0.6)
PP:     what, graphics, [(      )   ]
S:                      [yeah        ] (0.2) yeah
PP:     (°mm°) o(h)kay (0.8) are you fairly arty as well
        (0.4)
S:      YE:ah I [am actually        ]
PP:             [yeah c's I got 'n  ] arty feel with (.)  yeah=
S:      =ye [ah
PP:         [yeah
```

The the sitter has previously revealed that her boyfriend is largely unsupportive of her academic work, and in the first turn in this extract, the psychic offers an account of the boyfriend's uninterest, which generates repeated positive acknowledgement from the sitter ('ri:ght (0.5) right.'). The psychic then issues a question about the boyfriend which implies some existing knowledge about the sitter: 'does he work with his ha:nds,'. This question/implied claim is the candidate first turn in a projected attributive sequence; if the implied claim is accepted it is likely subsequently to be attributed to a paranormal source. However, the sitter replies that he does 'computer drawing', and the psychic's initial implied knowledge claim is now revealed to be incorrect.

This topic is subsequently abandoned, and after a clarification as to what the boyfriend does do, a new question is asked, 'are you arty as well'. This turn is designed to facilitate a positive response, in that the 'as well' trades on the lay or 'taken-for-granted' logic that people in relationships are likely to share common interests. It also constitutes the candidate first turn of a next potential attributive sequence; and once the sitter says 'YE:ah', the psychic says 'yeah c's I got 'n- arty feel', thereby attributing the now confirmed knowledge claim to an unspecified paranormal source. The unmarked correction here thus allows the psychic to move to the first turn of the next candidate attributive sequence, unencumbered by the kind of repair activity made relevant by explicit correction.

DISCUSSION

In this paper I have examined three discursive strategies available to participants in psychic-sitter interaction through which the credibility and authenticity of practitioners can be sustained in the light of what seems to be disconfirming evidence. These strategies are informed by broader normative expectations relevant to everyday forms of talk-in-interaction, and mobilise repair strategies through which participants in mundane discourse identify and address troubles or difficulties in such a way as to defuse potentially delicate interpersonal tensions.

Parapsychologists and counter advocates might wonder how a CA informed analysis of psychic practitioner-sitter interaction relates to cold reading accounts of psychic performance, and it is worth outlining two relevant issues.

Cold reading accounts emphasise psychological factors which are likely to lead people to interpret a psychic practitioner's claims as demonstrations of genuine paranormal abilities. The CA approach can complement this by identifying the wider culturally available normative conventions which inform communication in psychic-sitter interaction. Consider the case of embedded correction identified above: this is a generic interactional phenomenon through which participants in verbal encounters can identify and address errors in such a way as to avoid face-threatening explicit correction. The organisation of embedded or unmarked correction is not connected to speaker's personality, topic, context, the status of the participants, and so on. But it does reflect a normative orientation to the preservation of interpersonal harmony. To understand the apparent success of psychic practitioners, then, it may be important to supplement studies of individual psychologies with an analysis of socially organised communicative competencies which underpin the talk through which sittings and demonstrations are conducted.

The CA approach is agnostic as to the truth or falsity of claims which are advanced in interaction. It focuses on the mechanisms by which such claims are advanced, and the organised ways in which they are treated by co-participants. A cold reading account, however, explicitly presumes a sceptical position. In the sceptical literature psychic practitioners and sitters are regarded as deceptive, manipulative, gullible or deluded. By contrast CA studies of interaction do not seek to arbitrate on the truth or falsity of the content of utterances, but merely to describe the ways in which utterances are used to perform activities in interaction. This neutral concern with the organisation of interaction has the benefit of being able to identify practices and yield findings which are often obscured if the analysis is motivated by a priori assumptions and theoretical positions (Schegloff, 1997, 1999; Widdicombe 1995; Wooffitt, 2005).

To illustrate, we can return to extract 13, and the sitter's utterance 'He works in computer drawing'. There is a sense in which this is exquisitely designed to minimise the damaging inferential consequences of the psychic's prior error. The psychic has asked if the boyfriend works with his hands. This indexes a range of possible trades: manual labourer, carpenter, electrician, and so on. But it is not conventionally used to refer to computer based occupations, the kind of which are implicated by the sitter's answer. This is perhaps why the psychic seeks to clarify the boyfriend's occupation: 'what, graphics' unpacks what 'computer drawing' could be referring to, and is confirmed by the sitter. Here, then, is a puzzle: 'graphic artist' is a commonly known term used to describe the boyfriend's work; the psychic invokes it in her attempt to identify what the boyfriend does, and this is subsequently confirmed by the sitter herself. So, when faced with an incorrect claim about her boyfriend's occupation, why does the sitter not simply say 'he's a graphic artist', but 'he does computer drawing?

The description of the boyfriend's work establishes some 'common ground' with the psychic's implied knowledge claim. 'Drawing' is an activity; this resonates with the physicality of trades described as involving work with the hands. Moreover, 'drawing' specifically requires manual skills and dexterity, a set of physical relevances not invoked by 'graphic artist'. 'He does computer drawing' thus works to preserve the authenticity of the psychic: it formulates the boyfriend's work so that it minimises the degree to which the psychic's prior turn is in error.

Not only, then, is there embedded correction going on here, but the lexical choices out of which that activity is built exhibit a level of inferential sophistication unlikely to be captured by cold reading accounts which merely emphasise overt forms of manipulation, suggestion or deception.

ACKNOWLEDGEMENTS

I would like to thank two anonymous referees for their comments on this paper.

APPENDIX: TRANSCRIPTION SYMBOLS

The transcription symbols used here are common to conversation analytic research, and were developed by Gail Jefferson. The following symbols are used in the data.

(.5) The number in brackets indicates a time gap in tenths of a second.
(.) A dot enclosed in a bracket indicates pause in the talk less then two tenths of a second.
˙hh A dot before an 'h' indicates speaker in-breath. The more h's, the longer the inbreath.
hh An 'h' indicates an out-breath. The more 'h's the longer the breath.
(( )) A description enclosed in a double bracket indicates a non-verbal activity. For example ((banging sound))
- A dash indicates the sharp cut-off of the prior word or sound.
::: Colons indicate that the speaker has stretched the preceding sound or letter. The more colons the greater the extent of the stretching.
( ) Empty parentheses indicate the presence of an unclear fragment on the tape.
(guess) The words within a single bracket indicate the transcriber's best guess at an unclear fragment.
. A full stop indicates a stopping fall in tone. It does not necessarily indicate the end of a sentence.
Under Underlined fragments indicate speaker emphasis.
^ | Pointed arrows indicate a marked falling or rising intonational shift. They are placed immediately before the onset of the shift.
CAPS With the exception of proper nouns, capital letters indicate a section of speech noticeably louder than that surrounding it.
° ° Degree signs are used to indicate that the talk they encompass is spoken noticeably quieter than the surrounding talk.
°° °° Double degree signs have been used to indicate whispered or extremely quiet talk.
Thaght A 'gh' indicates that word in which it is placed had a guttural pronunciation.
> < 'More than' and 'less than' signs indicate that the talk they encompass was produced noticeably quicker than the surrounding talk.
= The 'equals' sign indicates contiguous utterances.

[Square brackets between adjacent lines of concurrent speech
] indicate the onset and end of a spate of overlapping talk. For example:

S2 yeah September [seventy six=
S1 [September
S2 =it would be
S2 yeah that's right

A more detailed description of these transcription symbols can be found in Atkinson and Heritage (1984: ix-xvi).

REFERENCES

Atkinson, J.M. and Heritage, J. (Eds.) (1984) *Structures of Social Action: Studies in Conversation Analysis.* Cambridge: Cambridge University Press.

Davidson, J. (1984) 'Subsequent versions of invitations, offers, requests, and proposals dealing with potential or actual rejection' in J.M. Atkinson and J.Heritage (eds.) *Structures of Social Action: Studies in Conversation Analysis*. Cambridge: Cambridge University Press, 102-128.

Drew, P. and Heritage, J. (1992) *Talk At Work: Interaction in Institutional Settings.* Cambridge: Cambridge University Press.

Heritage, J. 1984 *Garfinkel and Ethnomethodology*. Cambridge: Polity Press.

Hutchby, I. and Wooffitt, R. (1998) *Conversation Analysis: Principles, Practices and Applications*. Oxford: Polity Press.

Jefferson, G (1987) 'On exposed and embedded correction in conversation' in

G. Button and J.R.E Lee (eds.) *Talk and Social Organisation*. Clevedon, Multilingual Matters, 86-100.

Morris, R.L. (2005) 'Parapsychology in the Twenty-First Century' in M.A. Thalbourne and L. Storm (Eds.) *Parapsychology in the Twenty- First Century: Essays on the Future of Psychical Research*. North Carolina and London: McFarland, 21-27. (Originally published as 'Parapsychology in the 1990s: addressing the challenge' in the *European Journal of Parapsychology*, 1990-91, vol 8: 1-26.)

Pomerantz, A. (1984) 'Agreeing and disagreeing with assessments: some features of

preferred/dispreferred turn-shapes' in J.M Atkinson and J. Heritage, J. (eds.)

Structures of Social Action: Studies in Conversation Analysis. Cambridge:

Cambridge University Press, 79-112.

Roe, C.A. (1995) 'Pseudopsychics and the Barnum effect' *European Journal of Parapsychology*, 11, 76-91.

Sacks, H. (1992) *Lectures on Conversation*. Volumes I and II, edited by G. Jefferson and E. A. Schegloff, Oxford and Cambridge, Mass.: Basil Blackwell.

Schegloff, E.A. (1992) 'Repair after next turn: the last structurally provided defense of intersubjectivity in conversation' *American Journal of Sociology*, 97, 1295-1345.

Schegloff, E. A. (1997) 'Whose text? Whose context?' *Discourse and Society* 8: 165-187.

Schegloff, E. A. (1999) ''Schegloff's texts' as 'Billig's data': a critical reply' *Discourse and Societ*y 10(4) 558 - 572.

Schegloff, E.A., Jefferson, G. and Sacks, H. (1977) 'The preference for self-correction in the organisation of repair in conversation' *Language*, 53: 361-382

Smith, M. and Wiseman, R. (1992/1993) 'The effect of belief in the paranormal and prior set upon the observation of a "psychic" demonstration' *European Journal of Parapsychology* 9: 24-34.

Sorjonen, M.L. and Heritage, J. (1991) 'Constituting and maintaining activities across sequences: and-prefacing as a feature of question design' *Language in Society*, 23,1, 1-29

Ten Have, P. (1999) *Doing Conversation Analysis: a Practical Guide*. London and

Thousand Oaks: Sage.

Widdicombe, S. (1995) 'Identity, politics and talk: a case for the mundane and the everyday' in S. Wilkinson and C. Kitzinger (eds.) *Feminism and Discourse: Psychological Perspective*. London and Thousand Oaks Ca.: Sage, 106-127.

Wiseman, R. and Morris, R.L. (1994) 'Modelling the stratagems of psychic fraud' *European Journal of Parapsychology* 10: 31-44.

Wiseman, R. and Morris, R. L. (1995a) 'Recalling pseudo-psychic demonstrations' *British Journal of Psychology* 86: 113-126.

Wiseman, R. and Morris, R. L. (1995b) *Guidelines for Testing Psychic Claimants*. Hatfield: University of Hertfordshire Press.

Wiseman, R., and Schlitz, M. (1997) 'Experimenter effects and the remote detection of staring' *Journal of Parapsychology*, 61, 197-207.

Wooffitt, R. (2003a) 'The organization of demonstrations of paranormal cognition in psychic-sitter interaction.' *Proceedings of the 46th Annual Convention of the Parapsychological Association* New York: The Parapsychological Association, 329-346.

Wooffitt, R.(2003b) 'Conversation analysis and parapsychology: experimenter-subject interaction in ganzfeld experiments.' *Journal of Parapsychology*. 67: 299-324.

Wooffitt, R. (2005) *Conversation Analysis and Discourse Analysis: A Comparative and Critical Introduction*. London: Sage.

Wooffitt, R. (2006) *The Language of Mediums and Psychics: the Social Organisation of Everyday Miracles*. Aldershot: Ashgate.

THE ROOTS OF PARANORMAL BELIEF: DIVERGENT ASSOCIATIONS OR REAL PARANORMAL EXPERIENCES?

Rémi de Boer & Dick J. Bierman
University of Amsterdam

ABSTRACT

Pizzagalli et al have argued that paranormal belief is triggered by the experience of accidental associations. Persons who belief in psi phenomena (sheep) are thought to have a more divergent thinking style and hence would be vulnerable for 'seeing' coincidences as meaningful where they are just accidental. On the other hand, it could also be that 'sheep' have become sheep because they encounter more real psi events in their life.

After Brugger et al we used a lateralized word-priming paradigm in a lexical decision task to measure participants' ability to associate words that would normally be considered to be loosely associated at most. We also presented a similar image-priming task where the words were replaced by images of faces. The primes were of smiling or angry faces. The targets consisted of the blurred eyes of the same faces. In this task, participants had to classify the targets as female or male. Finally, we implemented an embedded psi condition in the image-priming task. In this condition rather than presenting the prime *before* the target, the (subliminal) prime was presented *after* the target.

Fifty-four participants participated in the experiment. The results of the word-priming task did confirm findings in the literature of faster response times for targets presented in the right visual field compared to targets in the left visual field. More surprisingly, the response times were fastest for indirect primes (loosely associated with the target). There was no difference between sheep and goats (non-believers).

In the image priming task we found a main effect of the presentation condition with the fastest responses for forward priming, and slower but about the same responses for control (forward) priming and backward priming. Interestingly, the (retro causal) backward condition yielded significantly faster response times than the control condition for the positive primes (t (50)= -2.981, p=0.004 two –tailed).

INTRODUCTION

In his article 'Creative or Defective' Radin (2005) asserts that many academics explain the belief in the paranormal by using one the three following hypotheses: Ignorance, deprivation or deficiency. 'The ignorance hypothesis asserts that people believe in the paranormal because they're uneducated or stupid. The deprivation hypothesis proposes that these beliefs exist to provide a way to cope in the face of psychological uncertainties and physical stressors. The deficiency hypothesis asserts that such beliefs arise because people are mentally defective in some way, ranging from low intelligence or poor critical thinking ability to a full-blown psychosis' (Radin). The deficiency hypothesis gets some support from the fact that the belief in the paranormal is an aspect of a schizotypical personality. However, to state that every single person believing in the paranormal is somehow mentally deficient is a bit over inclusive. However, the dysfunction may give some clues to what causes a belief in the paranormal.

Pizzagalli, Lehman and Brugger (2001) propose that a belief in the paranormal phenomena could be the result of connecting weakly related concepts or even randomly connecting unrelated concepts. This would result in processing serendipitous events as meaningful and related. An example of this kind of processing can be found in patient suffering from acute schizophrenia. These patients often display making inappropriate and incoherent associations. Their speech often consists of randomly uttered pieces of sentences, information, and contains fragmented narratives. According to Pizzagalli, Lehman and Brugger this can also be explained by a lack of inhibition within the semantic networks. Theories of spreading activation state that concepts can be represented as nodes which are interconnected throughout a network. Activation automatically spreads through these networks. In a normal functioning cognitive system, the strong related concepts are more strongly connected to each other than the weakly related concepts. In patients with schizophrenia, activation probably spreads in a diverging manner, thereby activating and associating new and unusual, weakly related connections.

The semantic priming paradigm has been developed for studying automatic spreading of activation in semantic networks (Pizzagalli, Lehman and Brugger, 2001). In this paradigm a stimulus (prime), such as a word or an image, is presented very briefly prior to another stimulus (target). Participants usually have to categorize the target using a keyboard or a response box. The short presentation insures that the prime is processed at a subconscious level. Research has made clear that participants are able to categorize a target faster if it has a strong association with a prime (e.g. dog primes barking). However, research with schizophrenics shows that patients exhibiting positive symptoms and thought disorder also respond faster to indirect primes (Pizzagalli, Lehman and Brugger). Indirect primes are words in which association is mediated by another word. For example, the concept Stripes primes the concept Lion through the mediation of the concept Tiger. In recent research it has been shown that a variation of the semantic priming paradigm can be used to distinguish between schizophrenic patients with or without a thinking disorder. It has been suggested that hyper associative thinking in schizophrenics is a consequence of a disinhibited spreading of activation probably as a result of over excitation/disinhibition in the brain.

Pizzagalli, Lehman and Brugger (2001) suggested that a belief in the paranormal could be caused by disinhibition within semantic networks. Since schizophrenic patients could be primed indirectly, Pizzagalli, Lehman and Brugger wanted to find out if healthy believers in the paranormal could also be primed indirectly. In order to investigate healthy believers and indirect priming, Pizzagalli, Lehman and Brugger used a variation of the previously mentioned semantic priming paradigm. They examined the spreading of activation as a function of the stimulated hemisphere. Participants were divided into a group having a very strong belief in the paranormal (Sheep) and a group having a very strong disbelief in the paranormal (Goat). Directly related, indirectly related, unrelated and pronounceable nonexistent primes were presented centre screen. Half of the targets were presented in the left visual field (LVF) while the other half was presented in the right visual field (RVF). Pizzagalli, Lehman and Brugger found that responses were faster for directly related primes than the indirectly and unrelated primes. Reactions were faster for indirectly related primes than unrelated primes. Further analyses of interaction-effects showed that Sheep reacted significantly faster to primes presented in the LVF but not to primes presented in the RVF. For Goats no such effects were found.

It appears that healthy Sheep show facilitation in their responses to indirectly related word pairs when the targets are presented in the right cerebral hemisphere. According to Pizzagalli, Lehman and Brugger (2001) these findings indicate a mechanism for divergent thinking, which may result in a belief in the paranormal. They further state that inhibition within semantics networks could point towards a possible biological basis for properties madness and genius has in common. It seems that an excessive inhibition will result in disrupted behaviour, while a more moderate disinhibition may give rise to useful creative insights. The results obtained in the Pizzagalli, Lehman and Brugger (2001) study are in agreement with research done by Faust and Lavidor (2003). In their research into divergent and convergent priming, they found that in the right hemisphere a prime activates a broader range of concept than it does in the left hemisphere. Faust and Lavidor think that the right hemisphere plays an important role in verbal creativity.

When considering Thalbourne and Delin (1994), a different perspective on the relation between divergent thinking and belief in the paranormal may become apparent. In this study, a high positive correlation between creative personality and belief in the paranormal was observed. Pizzagalli, Lehman and Brugger (2001), Faust and Lavidor (2003) and Thalbourne and Delin together show that at least there exists a correlation between a creative, divergent thinking personality and a belief in the paranormal. In research related to Pizzagalli, Lehman and Brugger (2001), Gianotti, Mohr, Pizzagalli, Lehman and Brugger (2001) investigated this relation between creativity and the belief in the paranormal. In this study participants had to come up with a word that would semantically connect two other given words. It was found that participants believing in paranormal phenomena came up with more original associations than sceptics when the two given words were unrelated. Apart from this, the Sheep tended to respond faster than Goats. In research by Radin, McAlpine, Cunningham (1994) and Dalton, Stevens (1996), Schlitz and Honorton (1992), Roe, McKenzie, and Ali (2001) participants with a creative personality performed better than other participants on various Psi tasks. When taken together, these results could indicate that an objective relation exists between processes that cause divergent thinking and the occurrence of paranormal phenomena.

Pizzagalli, Lehman and Brugger (2001) propose that the belief in the paranormal is the result of disinhibition within semantic networks. This may result in seeing connections that have no causal relation, but instead have a relation that is weak or even random. An alternative explanation for a ‘belief’ in the paranormal, is that this ‘belief’ is the result of actually having experienced paranormal phenomena. The divergent brain processes than may actually be a mechanism for sensing these kinds of phenomena. On the other hand, it may be a way of giving a post-hoc explanation after experiencing such paranormal phenomena. Until now, previous explanations on belief in the paranormal assumed that this belief would be an artefact of divergent brain processes. To date, this assumption has not been investigated. The goal of this study is to further examine this assumption. In this study, we want to determine if the belief in the paranormal is the result of divergent brain processes or if this belief is the result of actually experiencing paranormal phenomena. Basically, two models are examined for plausibility. The first model is based on the explanation Pizzagalli, Lehman and Brugger. This model states that a belief in the paranormal is caused by making incorrect associations as a consequence of divergent brain processes. In the second model, the belief is also caused by way of divergent brain processes, but by being a mechanism of perceiving paranormal phenomena. These perceptions in turn result in a 'belief the paranormal as a consequence of actually having experienced them. Apart from replication of the Pizzagalli, Lehman and Brugger study, we will be using Goats, Sheep and a group of participants who represent a category midway on measures of belief in the paranormal. Using this extra group of participants, it will be possible to determine what kind of relation there exists in the spreading of activation between Sheep, Goats and Middle group. If one takes into account the common held opinions on Sheep, these tend to assume that only Sheep are deviant in their behaviour and Goat are the ‘normal’. It might be that Goat and Middle group are similar in their processing, or that Goat and the Middle group also differ in their processing and thus responses. It could indeed be that the Goat also are showing a deviance from the normal, but in relation to hypothesis stated by Pizzagalli et al. appears yet not to have been investigated. Data on a questionnaire to determine belief in the paranormal will be used to explore the relation between intelligence and belief in the paranormal. This will be done to see if the deficiency hypothesis, as Radin (2005) abstracted from opinions held by academics, will hold up or not. In the current study, we will be attempting to take a measure of nonconscious psi performance in order to determine whether Sheep use divergent brain processes to detect paranormal phenomena. Based on the literature and previous research we predict that: (a) Sheep can be primed indirectly in the left visual field as opposed to Goats, (b) response times will be faster for direct primes than for indirect primes (c) Sheep will generally show faster response times than Goats, (d) Sheep are expected to score higher on measures of creativity, (e) if psi performances will be detected this will be stronger or found only in the group of Sheep. Both models will give the same results apart from the last hypothesis. If any observations will be done in congruence with this last hypothesis, this would give support for the second model. Past evidence already gives some support for this hypothesis, but these studies used paradigms that relied on the conscious effort on the part of the participant. In this study, we are trying to find out if the effects are also present at a subconscious, automatic level and are already influencing behaviour at this level. In addition, the current study is performed to investigate an alternative hypothesis to the one that Pizzagalli, Lehman and Brugger (2001) propose and therefore a similar method is employed.

METHODS

Participants

A total of 61 participants enlisted themselves for study credit as part of the University’s first year curriculum. These participants completed a questionnaire assessing belief in paranormal phenomena. After review, this resulted in data of which 54 participants were suitable for analyses.

APPARATUS

All stimuli were presented on a PC-compatible computer (733 MHz) using the Presentation® (http:// www.neuro-bs.com) software package. Windows® XP was used as the operating system. The stimuli were displayed on a 17 inch monitor running with a refresh rate of 75Hz. Screen resolution was set to 1024x768 pixels using a colour depth of 16 bits.

Paranormal Belief Questionnaire

A 13-item questionnaire was constructed to measure the degree of belief in paranormal phenomena. Items from the 'Paranormal Belief Scale' (Tobacyk & Milford, 1983) and the 'Paranormal Short Inventory' (Randall, (1997) were adapted and translated into Dutch. Items were scored using a 5-point Likert scale. Answers ranged from 'I Strongly Disagree' to 'I Strongly Agree'.

Image task

Objective. The purpose of this task is to detect possible nonconscious psi performance. A normal forward priming paradigm has been reversed. This has been done in order to determine if stimuli presented after a target can influence the reaction to this target in a manner similar to a normal forward condition. Reaction times of the normal priming condition are compared with a control and a backward prime condition. For the detection of a possible psi performance we require that a normal priming effect must be present to the stimuli.

Stimuli Stimuli consisted of pictures from males and females depicting a smiling or angry face. The pictures were sampled and adapted from the NimStim face stimulus set (http://www.macbrain.org). This stimuli set has been especially developed for doing research into facial recognition and emotion. All pictures have been standardized throughout this set. Pictures of 16 different males and 16 different females were used, from each a smiling and an angry face was used. The dimensions of all the stimuli used were 506x650 pixels. The prime was a complete picture of a face. The target consisted of this same, but edited picture. Only a rectangular area around the eyes was visible. Furthermore, for the targets the visible area of the remaining eyes had been blurred as to maximize the influence of the primes. A dummy prime was created using the picture of a coloured fractal and was edited as to suit the experiment. As fixation a red and green dot were used.

Stimulus Presentation. In total 192 trials were presented divided over two separate tasks. Both tasks included a self terminated break of at least 30 seconds. The prime-target pairs were randomly presented in three conditions: In the control condition, a dummy prime was presented before and after the target, in the causal condition a prime was presented before the target. While in the Retro condition, two primes were presented after the target. All stimuli were presented on a grey background.

The total duration of a trial was 5500 milliseconds. For a schematical presentation of the display times, see table 1 and figure 1. The rationale for this presentation scheme was to have each trial in each condition having the same internal structure and duration while still allowing to have a clear psi condition.

Participants were to judge whether the displayed target eyes were eyes of a female or a male as fast as possible after the beginning of the exposure of the target. To avoid the participant looking away from the screen after response and thereby miss the retro prime, they again had to give an answer after the red fixation dot turned into a green fixation dot. Their manual response consisted of pressing the 'Z'-button when the presented eyes were that of a female or the 'M'-button when the presented eyes were that of a male.

A manipulation check of the data showed that in the second part of the image task no normal forward priming effect occurred to the stimuli. So it was decided to discard the data of this second part before checking these data for backward priming effects, and only use the data from the first part of the image task for further analyses.

TABLE 1. IMAGE TASK DISPLAY TIMES IN MILLISECONDS

Causal condition										
Fixation	**Prime**	Fixation	**Target**	Fixation	**Dummy**	Fixation	**dummy**	Fixation	Fix. 2	Blank
800	20	180	1000	500	20	200	20	500	1200	560
Retro condition										
Fixation	**Dummy**	Fixation	**Target**	Fixation	**Prime**	Fixation	**Prime**	Fixation	Fix. 2	Blank
800	20	180	1000	500	20	200	20	500	1200	560
Control condition										
Fixation	**Dummy**	Fixation	**Target**	Fixation	**Dummy**	Fixation	**Dummy**	Fixation	Fix. 2	Blank
800	20	180	1000	500	20	200	20	500	1200	560

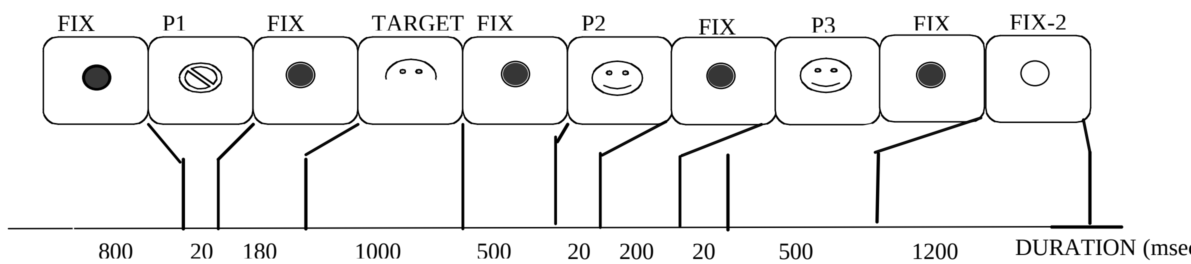

Figure 1: Timing of Fixations, Dummy (P1), Target and Primes (P2 and P3) in retro-condition of the image task. In Causal and Control conditions P1, P2 and P3 are different. (See Table 1). When FIX turns into FIX-2 the participants had to respond again. This is done to insure that participants will be exposed to the retro-prime, because they have to keep looking at the display after the first response.

Primed Lexical Decision Task

Stimuli All stimuli were letter strings of three to seven characters. Stimuli were selected, translated, and adapted for use in Dutch from Weisbrod, et al. (1999). Pronounceable nonexistent words were created from existing words and switching the first and last letter with the adjacent letter or substituting vowels in case a word was short or a combination of both. For instance, ‘tang’ (an existent Dutch word meaning ‘pliers’) transformed to the nonexistent ‘teng. A total of 240 prime-target word pairs were presented. The pairs were divided into four categories of prime-target relations. The prime was an existing Dutch word while the target was a directly related word (n=40), indirectly related word (n=40), unrelated word (n=40) or a pronounceable nonexistent word (n=120).

Stimulus Presentation The presentation of the 240 word-pairs was divided over two tasks of equal length. Each of these tasks included a participant terminated break of at least 30 seconds. Each task consisted of 20 directly word pairs, 20 indirectly word pairs, 20 unrelated word pairs, and 60 nonexistent word pairs. The word pairs were presented in random order. All primes were presented in the centre of the screen while half of the targets were presented in the left visual field and the other half was presented in the right visual field. As the original study by Pizzagalli, Lehman and Brugger (2001) only presented lateralised targets, this method has also been used in the current study. The lateralization wasn't completely randomized; the visual field into which a target was to be presented had been predetermined for each word pair. For displaying word pairs Arial was used as font. This was set to a size of 14 pixels. Stimuli were presented in black onto a white background. The mask consisted of a row of seven X's using the same font-size but in uppercase and a bold face, ensuring that the words were properly masked.

The total duration of a trial was 4000 milliseconds, see figure 2 for a graphical presentation of the stimulus presentation. At the beginning of the trial the mask was presented for 1050 ms followed by the presentation of the prime for 20 ms after which the mask was presented again for 180 ms. This was followed by the presentation of the target for 1000 ms. The target was followed by the presentation of the mask for 180 ms. This was done to insure that exposure to targets was the same in every trial. Using this method, any possible influences attributed to after images are prevented. The screen remained white for the remaining time of the trial, after which the next trial was started automatically. The target was either presented 257 pixels left or right from the centre of the screen. The prime-target stimulus onset asynchrony was 200 ms, hereby ensuring that the stimulus was processed automatically rather than controlled.

Participants had to respond by pressing the 'Z'-button when the presented target was an existing Dutch word or by pressing the 'M'-button when the target was a nonexistent Dutch word.

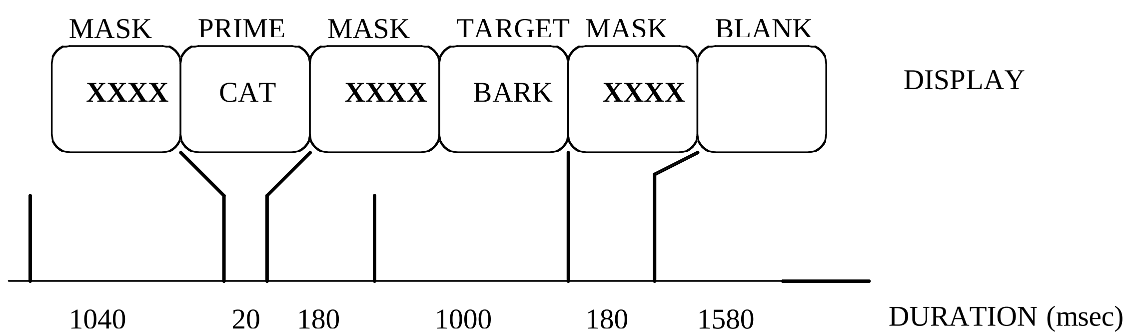

Figure 2: Timing of Masks, Prime and Target in Lexical Decision Task

Exit Interview

The exit interview consisted of 16 questions that could be answered with 'yes' or 'no'. The questions inquired after the individual experience with paranormal phenomena, creative activities the participant is involved in and religious orientation.

Procedure

At the start of the experiment the participants were instructed to take place at the computer in a dimly lit room, after which the experimenter gave a short explanation about the proceedings. The participant was told to follow the instructions presented on the screen. During the rehearsal trial the experimenter remained in the room to answer any questions and to see to that the participant understood the instructions. After eight rehearsal trials, the experimenter left the room. The experiment started with the image task and, after a short break, was followed by the lexical decision task. The lexical decision task began with ten rehearsal trials. After the lexical decision task, the participant was prompted to call for the experimenter. The experimenter turned on the lights and gave the participant the paranormal belief questionnaire and the interview questions. After the participant had finished filling out the questionnaire and interview, the experimenter turned of the lights and instructed the participant to continue the computer tasks. The tasks in the second half of the experiment again started with rehearsal trials. There was a break in the middle so as to give the participant a needed rest. In this manner, the number of presentation could be increased to obtain more statistical power. Upon completion of the experiment, the participant received their student credit from the experimenter.

RESULTS

If not otherwise noted, all reported response times (RT) are in milliseconds. Values for which the stimulus software indicated an OS error of over 5 milliseconds were removed. Outliers, defined by a value exceeding two standard deviations, were also removed for analyses. All remaining response times were log-transformed.

Paranormal Belief Questionnaire (PBQ)

In total 619 participants completed the PBQ, of these 420 were female (mean age = 21.29, sd=4.56) and 196 males (mean age=21.39, sd=4.23). The mean age of all the respondents was 21.32 yrs with a SD of 4.47.

The PBQ scores had a good internal consistency. The observed Cronbach alpha coefficient was .883. Scores on the PBQ can range from 13 to 65, indicating a low belief and a high belief in paranormal phenomena respectively. The mean score on the PBQ was 34.42, (sd = 10.19). The average scores of females and males differed significantly (two sample independent $t(615)=-6.3$, $p << .0001$ two tailed). The female participants believed more in the paranormal (36.02, sd=9.61) than the male participants (30.92, sd=10.22).

Primed Lexical Decision Task

According to Pizzagalli, Lehman and Brugger (2001) gender is a confounding factor in lateralisation studies and they used only female participants in their experiment. Therefore only the scores of the females (n=39) were used for analyses in this part of the experiment. Unfortunately, not enough male participants took part to investigate an interaction effect using gender. There were only two Sheep, five Goat, and seven male participants in the Middle group. Category designation was based upon the mean PBQ score and the standard deviation. Goats were defined as having a score smaller than the mean minus 1 standard deviation. This resulted in 5 goats. Participants were categorized as sheep if they had a score larger than the mean plus one standard deviation. This resulted in 10 sheep. The rest of the participants formed a third middle group (n=24).

A 3-Way ANOVA, with ‘Group’ (Sheep/Goats/Middle) as between subject factor, and ‘Visual Field (VF; LVF, RVF) and ‘Prime Category’ (directly related, indirectly related and unrelated prime-target relation) as repeated measures, was performed on individual mean RT’s of correct lexical decisions. Two significant main effects were observed: a main effect for Visual Field ($F(1,38)=9.774$, $p=.003$). Reaction times were faster for targets presented in the Right VF (mean = 659) as compared to targets that were presented in the Left VF (mean = 681), see table 2 for descriptive statistics. A main effect for association category was also observed, ($F(2, 38)=9.058$, $p=.001$). Participants responded fastest to indirectly related primes (mean = 661), somewhat slower to direct primes (mean = 670 ms), and slowest to unrelated primes (mean = 679). See table 3 for descriptive statistics.

TABLE 2. DESCRIPTIVE STATISTICS FOR REACTION TIMES IN LOG TRANSFORMED MILLISECONDS (MILLISECONDS BETWEEN BRACKETS) FOR LATERALIZED PRESENTATION OF THE TARGETS.

Visual Field	**Mean**	**SD**
Right Visual Field	6,491 (659)	,020
Left Visual Field	6,523 (681)	,021

TABLE 3 . DESCRIPTIVE STATISTICS FOR REACTION IN LOG TRANSFORMED MILLISECONDS (MILLISECONDS BETWEEN BRACKETS) TO THE DIFFERENT PRIME CATEGORIES (DIRECT RELATED, INDIRECT RELATED AND UNRELATED PRIMES-TARGET WORD PAIRS) .

Prime Category	**Mean**	**SD**
Direct related	6,507 (670)	,020
Indirect related	6,494 (661)	,020
Unrelated	6,520 (678)	,021

Image task

Since the image task is not part of the lateralization study, scores of both male and female participants were used in the following analyses. Category designation was based upon the mean PBQ score and the standard deviation. Goats were defined as having a score smaller than the mean minus 1 standard. This resulted in 7 goats. Participants were categorized as sheep if they had a score larger than the mean plus one standard deviation. This resulted in 12 sheep. The rest of the participants formed a third middle group (n=32).

A 2-Way ANOVA, with ‘Group’ (Sheep/Goats/Middle) as between subject factors, and ‘Prime Type’ (Retro, Causal, Control) as repeated measure, was performed on individual mean RT’s of correct gender categorisation of the faces. A significant main effect was observed for Prime Type ($F(2,49)= 15,299$, $p<.0005$). RT’s are fastest in the Causal condition, slower in the Control condition, and slowest in the Retro condition. See table 4 for descriptive statistics and figure 3 for a graphical display of the data. As figure three shows, sheep tended to respond faster in the Retro condition, about as fast as in the Causal condition, but the ANOVA showed no significant interaction effect, $F(2,49) = 1,180$, $p=.324$. Even though no interaction effect was found, it is important for making the distinction between the two competing models to analyse the difference between Goat and Sheep in the Retro condition. Therefore, an independent sample t-test comparing the RT’s between the Sheep and Goat in the Retro condition was performed. No significant difference was found, a large effect size was observed, $t(17)=1,532$ $p=.144$, Cohen’s $d= 0.77$. In the Retro condition, Sheep responded on average 69 ms faster than Goats. Given that this result was in the predicted direction and the effect size being large, we take note of a one-tailed trend, $t(17)=1,532$ $p=.072$.

TABLE 4:
DESCRIPTIVE STATISTICS FOR REACTION TIMES IN THE DIFFERENT PRIME CONDITIONS (RETRO, CAUSAL, CONTROL)

Prime Type	**Mean**	**N**	**SD**
Retro	740	51	17,62
Control	738	51	16,03
Causal	707	51	12,93

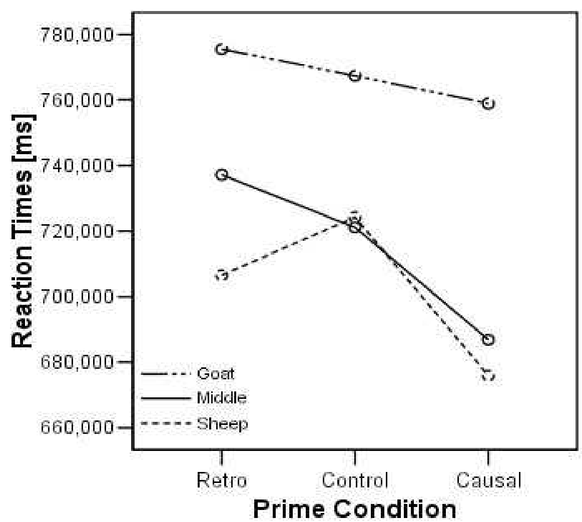

Figure 3 Reaction times for the groups Sheep, Goat, and Middle in the conditions (Retro, Control, Causal) in the image task**.**

To further explore the significant main effect for prime condition some extra analyses using a further split of the Primes in 'positive (smiling) and 'negative' (angry) were done. A 3-Way ANOVA with 'Group' (Sheep/Goats/Middle) as between subject factors, and 'Prime Type' (Retro, Causal, Control) and 'Valence' (positive and negative) as repeated measures, was performed on individual mean RT's of correct gender categorisation of the faces. Again the significant main effect was observed for Prime Type (F(2,49)= 13,511, p<.0005). A significant effect was observed for Valence, F(1,50)= 8,264, *p*=.006. A trend for an interaction affect was observed for Prime and Valence, F(2,49)= 3,169, *p*=.051. See table 5 for descriptive statistics and figure 4 for a graphical display of the data.

Since the effect for Valence was significant and a trend was found for the interaction between Prime and Valance, some post hoc analyses were done in order to specify what conditions were responsible for the effects. Valences of primes (angry, smiling) were compared with each other for every Prime condition using paired t-tests. A significant difference of 37 ms was found between the RT's for positive and negative primes in the Retro condition.

A paired sample t-test comparing RT's in the Retro positive and Control positive showed a significant difference of 22 ms, (t(50)= -2,981, *p*=.004). Participants responded faster in the Retro condition as compared to the control condition. This effect was completely due to Sheep (difference = 33 ms). An independent sample t-test comparing the RT's between the Sheep and Goat in the Retro positive condition found a trend with a large effect size, t(17)=1,959, *p*=.067, Cohen's *d*= 0.99. The 71 ms difference was in the predicted direction with the Sheep responding faster than the Goats. Considering the large effect size and the result being in the predicted direction, we take note of the one-tailed p-value, t(17)=1,959, *p*=.034. A paired sample t-test comparing RT's in the Causal positive and Control positive showed a significant difference of 34 ms, (t(50)= 3,769, p<.0005). Participants responded slower in the Control condition as compared to the Causal condition. Also a significant difference of 12 ms was found between the Causal and Retro condition for positive stimuli (t(50)= 2,430, *p*=.019). The RT's were faster in the Causal condition as compared to the Retro condition. See table 6 for descriptive statistics.

Group	**prime_condition**	**Valence**	**Mean**	**SD**
Goat (n= 7)	Retro	positive	754	29,73
		negative	787	44,54
	Control	positive	758	34,81
		negative	769	43,89
	Causal	positive	756	29,51
		negative	754	31,56
Middle (n= 32)	Retro	positive	698	13,91
		negative	741	20,83
	Control	positive	720	16,28
		negative	723	20,53
	Causal	positive	690	13,80
		negative	685	14,76
Sheep (n= 12)	Retro	positive	683	22,71
		negative	709	34,02
	Control	positive	716	26,59
		negative	746	33,52
	Causal	positive	655	22,54
		negative	699	24,11

Table 5. Descriptive statistics for reaction times for the three groups (Goat, Middle, Sheep) in the Retro, Causal and Control condition split for Valence (positive, negative)

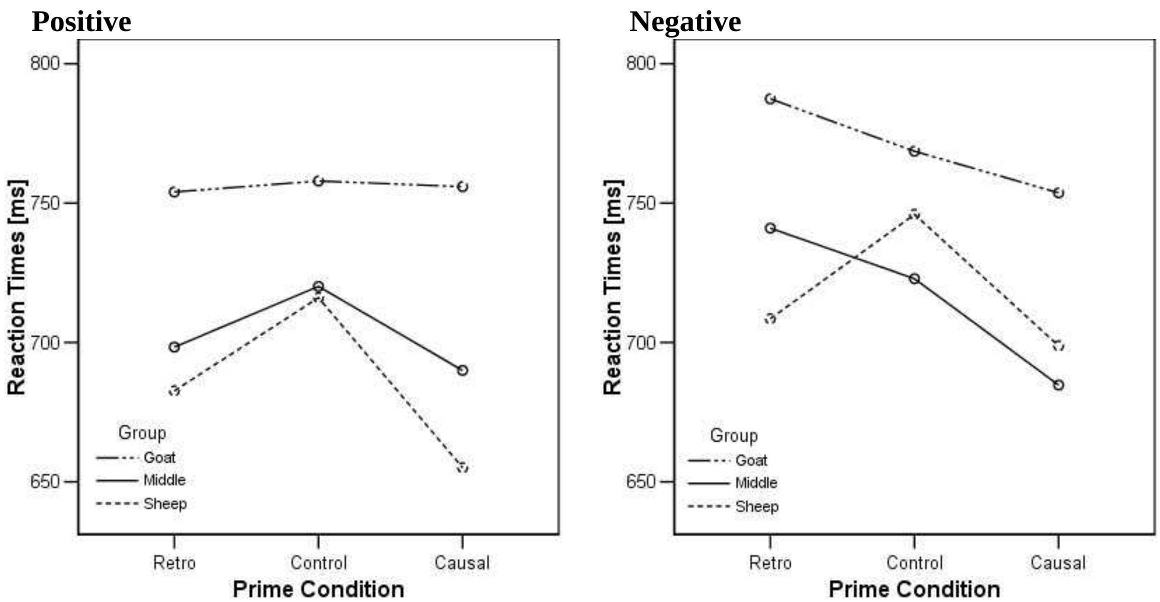

Figure 4 Reaction times of the groups Sheep, Goat, and Middle in the conditions (Retro, Control, Causal) in the image task split for Valence of the stimuli.

Prime condition	Valence	Mean	N	SD
Retro	positive	702	51	80,10
	negative	740	51	117,83
Control	positive	724	51	91,26
	negative	735	51	115,00
Causal	positive	691	51	82,17
	negative	698	51	85,09

Table 6 Descriptive statistics for reaction times in the Retro, Causal and Control condition split for valence (positive, negative).

Exploratory Analysis

Intelligence and belief in paranormal phenomena

The relation between scores on the PBQ and a measure of intelligence as measured by the Raven Standard Progressive Matrices was examined using Pearson's product moment correlation coefficient. Only the data of participants was used who completed the Raven Standard Progressive Matrices. No correlation was found between scores on the Raven Standard Progressive Matrices and scores on the PBQ, (r(516)=-.037, p=.399). Also, no correlation was found between scores on the Raven Standard Progressive Matrices and scores on the PBQ for males nor female participants. Analyses using an two sample t-test showed no significant difference between scores of Sheep and Goats on the Raven Standard Progressive Matrices,(t(179)=.444, p=.657). No significant differences were found between scores of Sheep and Goats on the Raven Standard Progressive Matrices for male and female participants, (male, t(64)=.315, p=.754; female, t(113)=-.568, p=.571).

Response times for Sheep and Goats

Whilst exploring the date it came to the attention of the experimenters that a difference might exist between response times of the Sheep and Goats. To see if a difference indeed could be observed an two sample independent t-test was performed on the data of the image task for ‘Group’ (Sheep and Goat) on individual mean RT’s of correct gender categorisation of the faces. A significant difference was observed in the Causal condition, (t(17)= 2,340, *p*=.032), whereby reaction times of Sheep are faster than those of the Goats. The same effect was found when the RT’s are pooled over the Causal and Retro conditions. A trend was found with the Sheep outperforming the Goats, (t(17)= 1.895, *p*=.075), see table 6 for descriptive statistics and figure 5 for a graphical representation of the pooled means of both tasks.

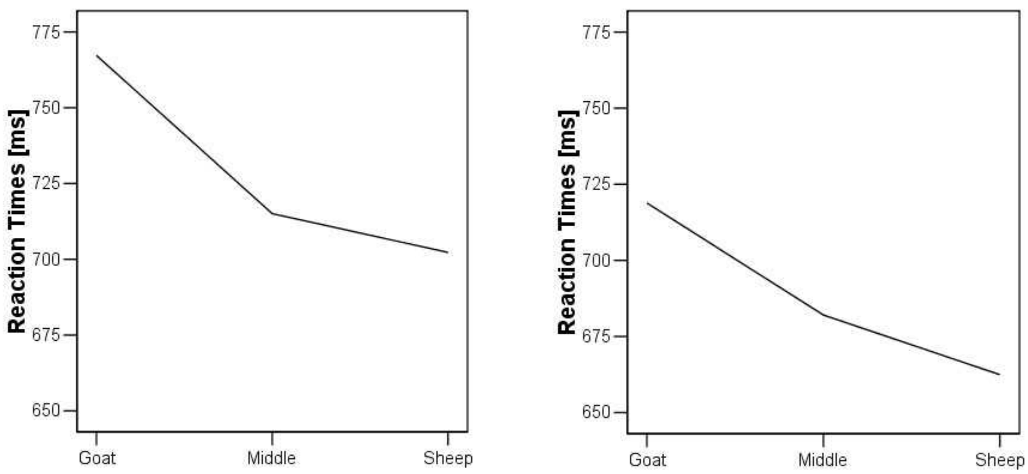

Figure 5. Reaction times of the pooled means (all conditions in the task except the control conditions) for the image task and the lexical decision task.

Interview

Experience

The relation between the 6 items inquiring into the experiences participants might have had with paranormal phenomena and scores on the PBQ was examined using Pearson’s product moment correlation coefficient. A positive, significant relation was observed between the two variables, (r(60)=.698, p<.0005). A high score on the PBQ was associated with more experiences with paranormal phenomena.

Creativity

The relation between the 5 items inquiring into creative activities the participants participated in and scores on the PBQ was examined using Pearson’s product moment correlation coefficient. Between the two variables a positive, significant relation was observed, (r(61)=.295, p<.021). A high score on the PBQ was associated with a higher reported participation in creative activities.

DISCUSSION

As was expected the priming effect for targets presented in the right visual field was stronger than for targets presented in the left visual field. This was true for Sheep as well as Goat. The hypotheses that a stronger priming effect would be found for direct primes in comparison to indirect primes found no support. It was even observed that responses to indirect primes were faster than responses to direct primes. A possible explanation for this finding is that, in spite of the procedure to select the word pairs (see method), some of the indirect primes were not as indirect as assumed nor were some of the direct primes, direct enough. The expected effects concerning the lateralisation hypotheses of the indirect primes were not observed. Sheep and Goat did not differ with regard to lateralized presentation of indirect related prime-target word pairs and direct related prime-target word pairs: no difference was observed between reaction times to indirect nor to direct primes for presentation in the left visual field. Sheep, Goat and the middle group all showed a priming effect to indirect related prime target word pairs. As hypothesised, there was a difference in degree of the priming effect for each group. In the image task it was observed that Sheep responded significantly faster than Goats. In the lexical decision task the difference had the same direction but failed to reach significance. The finding that Sheep in general respond faster than Goat can also be observed in the Pizzagalli, Lehman and Brugger (2001) study as well as in the association speeds in the Gianotti, Mohr, Pizzagalli, Lehman and Brugger (2001) study. A possible explanation for this finding could be that a relative decreased inhibition will result in more quickly reaching the activation threshold and hence a faster reaction. In previous research the Sheep and Goat have been compared with each other. Nothing could be said about how the Sheep and Goat would relate to the population that lies in between. In the current study participants with an average belief in paranormal took part as well. From the findings in this study it has become clear that a linear relation between measures of paranormal belief and reaction time exists.

Not being able to find an indirect priming effect in the left visual field in the way Pizzagalli, Lehman and Brugger (2001) did, might be attributed to a different setup concerning the lateralisation of the targets. They used a chinrest to fixate the distance and position to the screen so that targets were presented 100 centimetres from the screen. In the current study, the distance from target and the centre of the screen was a quarter of the screen width while the distance to the screen was approximately 4 screen widths. Thus, the target was about 4.7 degrees off the fixation point. This was done to insure that the target was within in one saccade movement of the eyes. Nevertheless, the fact that a main lateralization effect was established makes this point moot.

A more probable explanation is that our classification of Sheep and Goat may not have been extreme enough. Due to a lack of extreme participants in the population, this classification of Sheep and Goat was made using the population mean plus and minus *one* standard deviation respectively. In the Pizzagalli, Lehman and Brugger study Sheep and Goat were classified using *two* standard deviations from the population mean instead of one standard deviation. It should be noted that in the current study only the mean response times did show an effect dependent on the classification in Sheep or Goat. None of the predicted interaction effects were confirmed. This lack of further discrimination between Sheep and Goat fits with the suspicion that our classification was not extreme enough.

In the current study the use of stimuli also differed somewhat from the way stimuli were used in the Pizzagalli, Lehman and Brugger study. They used ten stimuli for each semantic category that were presented eight times in total, whereas the current study used 40 stimulus word pairs for each category and these were presented only once. If decline of the activation that has spread to an associated node is in the order of minutes then a subsequent activation might cumulate in the Pizzagalli, Lehman and Brugger study while this wouldn't happen in the current study, simply because the stimuli are only used once. This would be apparent by comparing the response times for the first, second and subsequent time the same prime-target pair is used in the Pizzagalli, Lehman and Brugger study, but we don't have access to the raw data to do this analysis.

The crucial hypothesis with regard to the 'roots of paranormal belief' stating that if a psi performance was observed, it would be stronger or be found only with the Sheep was marginally supported by the results. A psi (retro) priming effect for positive (smiling) primes has been found for the Sheep. It appears that Sheep also show some influence for the negative stimuli, but this fails to reach statistical significance.

Future improvements

The near linear relation of the scores on the sheep-goat scale with response times suggests that this scale is appropriately measuring some underlying trait. We feel that in future research however the classification criterium of two standard deviations should be adhered to in order to get interaction effects.

The image task was intended to detect nonconscious psi performance. Considering the finding that positive stimuli were the only ones resulting in an apparent retro causal influence, a future experiment could use only positive primes, reduce the number of stimuli and present these stimuli several times, thus potentially drawing also upon cumulative effects. Another improvement could be to reduce the time between target presentation and (post) prime. In this experiment this interval was set at 1500 ms. Because we can assume that retroactive influence declines with larger time distance a shorter interval may be tried. The mean response times in this study were around 650 ms. Thus, there is still room for shortening the time interval between target and prime. However, trials with response times exceeding the interval should be disregarded in order to exclude normal forward causal explanations.

CONCLUSION

The explaining mechanism for previous findings in the literature has mostly been interpreted from the point of view of *decreased inhibition*. This is probably, because in cases of schizophrenia by using an explanation of disinhibition most of the pathology can be explained. But what will happen if the inhibition increases? Can this explain the slower response times for the Goats? It appears so, taken the reverse of the explanation of the fast reactions of the Sheep, one would argue that because of an *increased inhibition* it would take more time for activation to spread through a network and result in slower response, especially to ambiguous stimuli. If this were the case for extreme inhibition, meaningful, but weak, relations may not be activated at all. A short-sightedness may in fact occur, only activating dominant concepts. According to Pizzagalli, Lehman and Brugger (2001) a moderate disinhibition might give rise to creative insight, while too much disinhibition would result in disruptive behaviour. Too much inhibition may also result in pathology, but the effects are probably less obvious compared to the patient suffering from schizophrenia. Extreme skeptics might not be able to follow logical arguments based upon subtle steps and find the world with these subtleties threatening thereby denying anything but the accepted world view. Tolerance for ambiguity might be extremely low and pathology might arise that would result in difficulties to act in new social environments. Further research on the personality of (extreme) Goat might shed light on this issue.

While a small subpopulation of people believing in paranormal phenomena may be mentally deficient, the deficiency hypothesis as explained by Radin (Radin, 2005) found no support in study. In post-hoc examination of the relation between scores on the Paranormal Belief Questionnaire and scores on a measure of intelligence as measured by the Raven Standard Progressive Matrices showed no differences between Sheep and Goats.

It is concluded that divergent thinking does not have to be the only possible explanation for the origin of the development of a ‘belief’ in the paranormal. The results from this study and presented articles give enough support to the alternative hypothesis that experience of objective psi events might contribute to the origination of a ‘belief’ in the paranormal.

In addition, no support was found for the hypothesis that people who belief in paranormal phenomena are mentally deficient. What is observed is that a belief in paranormal phenomena is associated with faster responses on decision tasks. This may suggest that decreased inhibition will result in more quickly reaching an activation threshold that, in turn, results in more rapidly spreading of activation in the semantic networks. Eventually this might cause psi information to be manifested more easily. Although we couldn’t assess an interaction between Sheep-Goat and the retro-priming effect, we were able to demonstrate this psi effect and it was clear from the descriptive data that Sheep contributed mostly to this effect. This, together with all the previous literature, suggesting a relation between psi performance and ‘belief in the paranormal’, indicates that this belief may not arise from mental deficiency, but may arise from fact.

ACKNOWLEDGEMENT

Development of the MacBrain Face Stimulus Set was overseen by Nim Tottenham and supported by the John D. and Catherine T. MacArthur Foundation Research Network on Early Experience and Brain Development. Please contact Nim Tottenham at tott0006@tc.umn.edu for more information concerning the stimulus set.

REFERENCES

Dalton, K., & Stevens, P. (1996). Geomagnetism and the Edinburgh automated ganzfeld. *European-Journal-of-Parapsychology, 12,* 23-34.

Dollfus, S., Buijsrogge, J. A., Benali, K., Delamillieure, P., & Brazo, P. (2002). Sinistrality in subtypes of schizophrenia. *European psychiatry,17(5),* 272 -277

Dragovic, M., & Hammond, G. (2005). Handedness in schizophrenia: a quantitative review of evidence. *Acta Psychiatrica Scandinavica,111(6),* 410-419.

Faust, M., & Lavidor,M. (2003). Semantically convergent and semantically divergent priming in the cerebral hemispheres: Lexical decision and semantic judgment. *Cognitive-Brain-Research, 17(3),* 585-597.

Gianotti, L. R. R., Mohr, C., Pizzagalli, D., Lehman, D., & Brugger, P. (2001). Associative processing and paranormal belief. *Psychiatry and clinical neurosciences, 55(6),* 595-603.

Helling, I., Öhman, A., & Hultman, C. M. (2003). School achievements and schizophrenia: a case–control study. *Acta psychiatrica Scandinavica, 108(5),* 381-386.

Holt, J. N., Delanoy, D. L., & Roe, C. A. (2004). Creativity, subjective paranormal experience and altered states of consciousness. In *Proceedings of the Parapsychological Association Convention 2004* (pp. 433-436).

Karlsson, Jon L. (2001).Mental abilities of male relatives of psychotic patients*. Acta Psychiatrica Scandinavica, 104(6),*466-468.

Mackintosh, N. J., & Bennet, E., S. (2005). What do Raven's Matrices measure? An analysis in terms of sex differences. *Intelligence, 33(6),* 663-674.

Pizzagalli, D., Lehman, D., & Brugger, P. (2001). Lateralized direct and indirect semantic priming effects in subjects with paranormal experiences and beliefs. *Psychopathology, 34(2),* 75-80.

Radin, D. I., McAlpine, S., & Cunningham, S. (1994). Geomagnetism and psi in the ganzfeld. *Journal-of-the-Society-for-Psychical-Research, 59,* 352-363.

Radin, D., I. (2005). Creative or defective. *Shift: At the Frontiers of Consciousness, 6.* Retrieved February 7, 2006 from http://www.noetic.org/publications/shift/issue6/s6_frontiers.pdf.

Randall, T. M. (1997). Paranormal Short Inventory. *Perceptual and motor skills, 84(3),* 1265-1266.

Roe, C. A., McKenzie, E. A., & Ali, A. N. (2001). Sender and receiver creativity scores as predictors of performance at a Ganzfeld ESP task. *Journal of the Society for Psychical Research, 65,* 107-121.

Schlitz, M. J., & Honorton, C. (1992). Ganzfeld psi performance within an artistically gifted population. *The Journal of the American Society for Psychical Research, 86,* 83-98.

Thalbourne, M.A., & Delin, P. S. (1994). A common thread underlying belief in the paranormal, creative personality, mystical experience and psychopathology. *Journal-of-Parapsychology. 58(1),* 3-38.

Tobacyk, J., & Millford G. (1983). Belief in paranormal phenomena: Assessment instrument development and implications for personality functioning. *Journal of personality and social psychology, 44(5),* 1029-1037.

Weisbrod, M., Kiefer, M., Winkler, S., Maier, S., Hill, H., Roesch-Ely, D., & Spitzer, M. (1999). Electrophysiological correlates of direct versus indirect semantic priming in normal volunteers. *Cognitive Brain Research, 8(3),* 289-298.

COMPARING A FREE-RESPONSE TEST USING AN OBJECT AND WITHOUT OBJECT CONDITION: FIRST STUDY EXPLORING THE "TOKEN-OBJECT" EFFECT ON AN UN-GIFTED SAMPLE

Alejandro Parra and Juan Carlos Argibay

Instituto de Psicología Paranormal
Buenos Aires
ARGENTINA

ABSTRACT

Psychometry is an anomalous cognition system for psi-detection. For example, psychics have often claimed to have the ability to obtain "impressions" about people from objects that they have owned. Many authors have suggested explanations for psychometry, which are in line with Roll´s "psi field." Research has mostly been limited to qualitative analysis because psychometry is very difficult to research due to problems in evaluating "free response" material. To date, there has been little interest in the exploration of psychometry among "ordinary" people. In this study, psychometry-based experimental research and ESP hits were compared with visual images to assess strategies. "Psychometric" and "non-psychometric" procedures were counterbalanced. Seventy one unselected, ordinary people (age range= 18-77; Mean= 46.44; SD= 14.03) were recruited as participants by announcements. All participants underwent the two conditions of the psi experiment: the use of token-object and visual images. Test instructions were given to both participants and target persons. Four volunteers carried identical objects with them for fifteen days. Blind coding and recoding procedures were used by the experimenters. Participants "touched" four objects for impressions and completed four trials. Target persons blind scored the participant´s statements. A similar procedure was employed for the free-response test (visual). Targets for both the visual test and the token-objects, were randomly assigned. The non-psychometry condition (p= .005) resulted in higher scores than those obtained in the psychometry condition. The difference between both target conditions (no-psychometry vs. psychometry) was also significant (z-score= 2.65, p= .008, two-tailed). We conclude that this experiment offers some support for the claim that visual image stimulation is more psi-conducive, presumably at least among ordinary people. Psi seems to work better using visual imagery than in a "token object" condition. It may well be that the anomalous cognition with psychometry is a more complex cognitive process than we have considered it to be.

INTRODUCTION

Some people feel that they are "sensitive" and able to get impressions about the owners of objects through the use of some form of ESP. *Psychometry*, an anomalous cognition system for psi-detection, has also been called retrocognition, or, although less used, *pragmatic cryptesthesia* (proposed by Richet, 1922). The term is also used for the theories and techniques of psychological measurement. Throughout the history of psychical research, psychics have claimed the ability to get "impressions" from objects, these impressions constituting information about the owners and past histories of the objects other than what could be inferred from their known physical properties. Such claims, supported almost exclusively by anecdotal material, have been difficult to evaluate insofar as deciding whether some form of ESP must be postulated to account for the results.

Psychometry and precognition usually imply the factor of time (events past/future). The term "psychometry", coined in 1842 by Dr. J. Rhodes Buchanan, describes a type of knowledge (or extrasensory perception, ESP) which permits a psychic or sensitive to receive impressions using a physical object as inductor or instrument to express the information perceived (Buchanan, 1885), in contrast to other forms of ESP communication which are more questionable, such as the "psychic reading" face to face (of a consultant) or through control spirits (spiritualist medium) (Bentley, 1961; Rogo, 1974; Somogyi, 1974).

The first studies began around 1860. Professor William Denton described psychometry tests performed by his sister, Mrs. Ana Cridge (Denton, 1863). F.W.H. Myers, one of the founders of the (London) Society for Psychical Research, wrote in his monumental work *The Human Personality* (Myers, 1903) that "the objects that have been in contact with organisms preserve traces of them, and sometimes it seems like the inorganic nature could become luminiscent, so to speak, with the long history of its past."

References to influences originating in objects can be found in the work of Mrs. Sidgwick discussing Hodgson's reports on séances with Mrs. Piper. The longest and more methodical studies carried out employing psychometry were performed by Dr. Gustav Pagenstecher, of Mexico city, with Mrs. Maria Reyes de Zierold (Pagenstecher, 1920, 1922, 1924, 1928; Roll, 1967), whose results were so impressive that Walter Franklin Prince, president of the American Society for Psychical Research visited México and published some additional reports on the subject (Prince, 1920, 1921, 1922). Dr. J. Hettinger received his degree of doctor in philosophy, at the University of London, for his experiments described in his book *The Ultra Perceptive Faculty* (Hettinger, 1940) as well as developing a program for the investigation of psychometry (Hettinger, 1948).

W.G. Roll (1964, 2004) has suggested one line of theory that may explain psychometry. Roll theorizes that people and objects generate a "psi field" much the same as the earth generates a gravitational field. People may also impress or intermingle their own psi fields on objects they have frequently handled. A sensitive can read traces from this field by handling an object or by proxy come into the direct psi field of the owner.

The first attempt to disprove the "telepathy theory" of psychometry was made in experiments with the Polish clairvoyant, Stefan Ossowiecki, who was to demonstrate his abilities to an international conference on psychical research in Warsaw held in 1923 (Barrington, Stevenson, and Weaver, 2005). As a test, Eric Dingwall, research officer of the Society for Psychical Research, prepared a picture of a bottle in a frame, dated it August 22, 1925, wrote a sentence on the back of the picture and sealed it in three separate envelopes, each within the other. This packet was sent to Warsaw. Dingwall remained in England to offset the theory that Ossowieki was telepathically tapping his mind. Ossowieki was given the object and concentrated on impressions received from the contents. He was able to draw the bottle accurately, read the date, but not the month, and divine that there was writing on the drawing, but not what it said. This experiment is impressive, but since we now have considerable evidence of long-distance ESP, the test does not argue against telepathy.

W.H.C. Tenhaeff's major contribution to the study of psychometry was not on *how* it works, but in fact, what causes it *not to work* (Tenhaeff, 1972). He believed that there are suggestions deriving from the object itself. For example, a knife might evoke scenes of a stabbing which may be wholly a fantasy suggested by common associations with the object. Secondly, telepathy from the object's owner may get the psychic "off the track." Thirdly, since most psychometrists report that they try to capture psychically induced mental images which they then *interpret*, they may in fact misinterpret these images or even confuse non-psychic with psychic images.

Osty (1923), a physician and later director of the Institut Metapsychique International, in his book, *Supernormal Faculties in Man*, discusses the remarkable results he obtained from several sensitives. Osty (1923) found that neither he nor his subjects were able to judge the accuracy of their impressions: "There is one only mode of estimating their value -- to write down the tenor of the words spoken and compare them with facts" (p. 213). This makes sense if the images that are evoked are the subject's own.

Most studies on psychometry have been anecdotal. Because of the problems in evaluating "free response" material it is very difficult to research this ability. However, researchers like Tenhaeff, Osty, and Roll have attempted to make some sense of all this material by a qualitative analysis of psychic readings. These studies, however, have concentrated on the nature of the object used during psychometry or on the abilities of the psychic.

Parapsychologists are becoming increasingly preoccupied with gifted subjects (mediums and sensitives), but little interest had been given to explore psychometry among “ordinary” people. Research with ordinary people seems to reveal new aspects of the ESP process, such as the distribution of the psychometry as ability, predicated by Buchanam and Denton the past century. In fact, psychometry is one of the main hopes for an empirical solution of the question whether human personality survives death. The ostensible ESP responses also produced by mediums and sensitives are usually verbal utterances and, occasionally, drawings or behavior by which the subject attempts to imitate some target person or situation.

The determination of probabilities by subjective judgments represents an uncertain and undesirable element in a statistical analysis. This type of material is much more difficult to appraise statistically than ESP card-guessing trials. J. G. Pratt (1969) replaced this by a procedure where the probability of each statement was determined by the group of target persons participating in the tests. In these experiments, where Mrs. Eileen J. Garrett was the subject, there were fifteen TPs. In a given test, one of these occupied a room adjacent to Mrs. Garrett while she produced a series of statements supposedly pertaining to him. After the completion of all sessions, each TP annotated all the statements according to whether or not they applied to his circumstances, but without knowing which statements had actually been made by Mrs. Garrett when the subject was in the next room. On the basis of these annotations, it could be determined which statements were true for one, two, three, four, etc., of the TPs and the statements were assigned probability values accordingly. Using Fisher's method for combining probabilities, Pratt then arrived at a total result. This method was an improvement over the Saltmarsh-Soal approach because it substituted an objective for a subjective determination of the probabilities of the individual responses. However, a difficulty remained. This was due to the possible interdependence between the subject's responses.

A Series of psychometry-based experiments were designed by us. They allowed us to explore new strategies for using and appraising “token-object” effect both, individually or in groups. ESP hits were compared to assess both, “psychometric” vs. “non-psychometric” procedures in ordinary people; in this case, the aim is explore whether there is a significant difference between ESP tests using objects (“token-object” effect) and enveloped images as ESP stimuli. Another additional purpose is to describe the technique design employed in the hope that it may be of value to other researchers. This experiment also illustrates how parapsychological testing procedures may be adapted to the particular needs and abilities of the samples of subject – adaptations which are, unfortunately, rare in contemporary parapsychological research.

The theoretical position underlying the present experiments has been outlined elsewhere by William G. Roll (Roll, 1964). Very briefly, the theory postulates that every material object possesses a “psi field”; that events in the history of the object leave traces in its psi field; that these traces constitute stored information which is retrievable, under the right conditions, by certain sensitives, using some form of ESP; and that these traces give an object “psychic distinctiveness” to a sensitive in direct proportion to the distinctiveness and intensity of the persons (owners) and events which have been associated with the object’s history. Informal observations of some sensitives and the “folklore” of psychical research suggest that photographs, in particular, have traces associated with the persons or events depicted in the photograph. No conjectures about the nature of psi fields, or the mechanism whereby information is retrieved from them, will be made here.

METHODS

Participants

The sample consisted of 71 participants (63.4% females and 36.6% males) who were all well-educated, psi-believing participants. The ages ranged between 18 and 77 (Mean= 46.44; SD= 14.03). Each attended two tests, token-object and photos). Personal experiences suggestive of psi were reported by the majority of the subjects, such as ESP “feelings” around sick people (56%), around past place events (50.8%), around "token" objects (34.7%), around unknown people (69.4%), around "token" photos (38.3%). Seventy-eight percent of the participants have had some training in meditation or other techniques involving an internal focus of attention.

Participants were recruited by media announcements and the mailing list. An announcement was also placed on the internet (*www.alipsi.com.ar*). The announcement had a brief explanation of the ESP test procedure and encouraged them to have an interview with us in order to gain more information about the topic.

Participant Orientation

Two-hour encounters (or workshops) each week were organized at the IPP with the people who were recruited. Fourteen free-of-charge, separate groups were conducted by AP and JCA over a period of two years. Between 5–10 participants each group were involved. Participants took part in weekly two-hour workshop activities. The participants received some information about the series tests. AP and JCA created a friendly and informal social atmosphere, engaging in conversation with the participants before the test. All of the participants filled out personality and psychological inventories and questionnaires whose results will be published otherwise.

Test instructions

Participants. The experiment was described to the participants. They were told that two different kinds of ESP tests were being undertaken, with two conditions: one using an object (psychometry condition), and the other using images as psi-stimuli (non-psychometry condition). Participants were informed that both situations can stimulate psychic abilities in people, and that this research was exploring both situations in one research project, so that their relative importance in stimulating psychic abilities could be evaluated. Before the start of the session, each participant underwent 9–minutes relaxation exercise for both conditions, which included progressive autogenic phrases (Jacobson, 1974) using the voice of one of us (AP). Psychometry and non-psychometry conditions were also counterbalanced for each group of participants.

Target Persons. Explanations of the experiment were given to the person-targets. They were four adult volunteers, two males and two females, who have ordinary lives. None of them had extraordinary events (that we know about) during the course of the experimental series. They were told to carry with them for fifteen days an identical object (a leather and metal key ring) each, which they had acquired in a gift store. They received one object each on day 1. On day 16, they returned the object in a box to AP.

Psychometry procedure

Target security. One hundred identical objects were pooled to be randomized. Four "token objects" were coded as 1–4 by AP, but this procedure was blind for JCA, who was not aware of the person-targets. After day 16 AP delivered all of the objects to JCA, who recoded them. This procedure was also blind for AP. Before the participant's sessions JCA delivered all of the token-objects to AP in a little box, so that the test was conducted blind: AP who was in contact with each participant during the test period, did not know which codes JCA had recoded the "token-objects." Also, JCA also did not enter the test's room during the test performance and was in a nonadjacent, sound-attenuated room. Once the test period ended, AP delivered the token objects to JCA, who recoded them again as he had found them before the test session. JCA and AP kept paper-and-pencil records isolated, sensory-cues proof during all randomization procedure and handling procedure of the token-objects.

Test Procedure. Two rooms were necessary for this test procedure; one for AP and the participants, and the other for JCA. The participants remained seated in a chair. AP delivered the "token-objects" to the participants in little boxes. The instructions for each participant during the test were simple: "remain with eyes closed, quiet, waiting for mentations about object during few minutes." AP remained silent in the room to observe the testing period, which usually lasted 60 minutes. Each participant "touched" the object. Afterwards the participants wrote his/her 'impressions' on a blank space on a form. Each participant completed four trials. Four forms were used for each participant. Once participants completed the four trials, AP gave the boxes and the forms back to JCA for coding. JCA enveloped the forms of the group participants for each person-target to judging procedure. Each form was individually signed by participants. Participants were not given trial-by-trial target feedback of the person-target's scores during test period. No information about PTs were given; total scores were returned at the end of the workshop series (PTs remained unidentified).

Judging procedure. AP delivered forms filled out by participants to the target person. Some instructions were given for this. He asked them to rank carefully each statement as they consider they adjust to their own psychological, physical, or any other trait written by the participants. A score of "1" was assigned to the candidate the participant believed has the strongest similarity to his impression; a score of "4" was given to the candidate participant who was least like the experience. Score 4 was also given if the participant did not write any statement on the form, however, each form had at least five to fifteen sentences each for evaluation. Person-targets did not know who the participants were but knew that one of the four statements per form corresponded to his/her token object. They scored participant´s statements blindly so that they also did not know which statement each participant had written. After this procedure was completed, the envelopes were returned closed and wax-sealed. Once target- persons had completed the judging procedure, they gave the forms back to AP. After the judging procedure, each target-person contacted AP in order to deliver the forms and scores for evaluation.

Non-Psychometry procedure

Target security. Two thousand well differentiated images such as animals, people making things, landscapes, religion symbols, scenics, structures, and caricatures and humoristic cartoons were pooled to be randomized. In a double blind procedure, images were recorded and selected prior to the experiment by co-experimenter JV. All images were re-clustered into eight clusters. In his house, JV selected eight images, from which two of them were randomly selected to serve as the target-image. All of eight images were printed on glossy-paper (from a CD clip art). Before the test period, visual targets were adequately screened in materials known to be opaque (black cardboard), pressed with two posterboards to avoid marks on the paper image, and placed inside an envelope closed and wax-sealed by JV. Afterwards, JV delivered the envelopes to JCA. Before the session, JCA then delivered the envelopes to AP containing two target images for each participant. AP (who was in contact with the participant during test period), did not know which target-images the co-experimenter had enveloped. JCA and JV kept paper-and-pencil records isolated. The records of target selection, once made, were kept locked away when the experimenter was out of the room. This procedure was used for five reasons: 1. the pictures were easily clustered; 2. to facilitate the randomization process; 3. target-pictures were characterized by their diversity and visual attractiveness to serve as good targets for a GESP experiment; 4. to avoid any sensory (visual) cues; 5. to avoid any target manipulation, mainly during the target-viewing and the judgment processes.

Test Procedure The participants remained seated in a chair. AP remained silent in the receiver's room to observe the testing period. AP delivered the "image" to the participants. The instructions for each participant during the test were simple: "remain with eyes closed, quiet, waiting for mentations about image for a few minutes." AP remained silent in the room to observe the testing period. Two forms were used for each participant. Once each participant completed the trials, AP gave the envelopes back to JCA for coding. Participants were not given trial-by-trial target feedback of the target's identity during test period; they were given at the end of the series meeting. Information about the target identity was given at the end of the session.

Judging procedure. AP delivered the envelopes and the forms to JCA, who opened all envelopes. AP delivered the envelopes to each participant, who viewed the four potential targets (the actual target and three decoys) which were re-enveloped and presented in four random sequences by JCA before delivering them to AP. The participants, viewing each candidate, associated to the item as though it were the actual target, describing perceived similarities between the item and the mentation. A score of "1" was assigned to the candidate the participant believed had the strongest similarity to his mentation; a score of "4" was given to the candidate the participant felt was least like his/her experience. Each form was individually signed by participants. The distribution of the four candidates (the image-target and three decoys) was also randomized, so that neither AP nor participant knew any image position and to avoid place preference during judging procedure. It did not use a duplicate of the target set for judging when the target was handled separately from the decoys.

Target randomization

The randomness source was an electronic random number generator (RNG) for both targets, visual and token-objects. Randomization procedures were applied before each session tests. Randomization procedure of targets was considered adequate. The position of the (visual) target within the target set as presented to the judge was also randomized.

Consent Form

As a part of the recruiting procedure, the participants filled out a Consent Form: "The study is being conducted by Alejandro Parra and Juan Carlos Argibay of Institute of Paranormal Psychology at Buenos Aires. No deception is involved, and the study involves no more than minimal risk to participants (i.e., the level of risk encountered in daily life). Participation in the study is typically strictly anonymous. All responses are treated as confidential, and in no case will responses from individual participants be identified. Many individuals find participation in this study enjoyable, and no adverse reactions have been reported thus far. Participation is voluntary, refusal to take part in the study involves no penalty or loss of benefits to which participants are otherwise entitled, and participants may withdraw from the study at any time without penalty or loss of benefits to which they are otherwise entitled."

RESULTS

The non-psychometry condition, where images were employed as ESP targets, elicited better results than the psychometry condition, where token objects by person targets were employed (p= .005 vs. p= .03). The difference between both target conditions (no-psychometry vs. psychometry) was also significant (z-score= 2.65, p= .008, two-tailed) (see Table 1).

TABLE 1: COMPARING PSYCHOMETRY PROCEDURE VS. NO-PSYCHOMETRY PROCEDURE (N= 71)

	HITS			
	YES	NO	TOTAL	z-score*
PSYCHOMETRY	63 (22.18%)	221 (77.81%)	284	–1.03**
NON-PSYCHOMETRY	49 (34.50%)	93 (65.4%)	142	2.52***

* Correction for continuity was applied.
** *p*= n.s., one-tailed
*** *p*= .005, two-tailed

DISCUSSION

This experimental series studied two different targets comparing a psychometry procedure with a "token" object to a GESP technique (clairvoyance) with a free-response test. We would conclude that this experiment offers some support for the claim that visual image stimulation is psi conducive in the case we find a significant difference between the psychometry and the no-psychometry condition but notably in a positive direction for the visual image condition (p= .005, two-tailed). The difference between both conditions was also significant (p_{dif} . 008).

Psi seems to work better in the visual than the "token object" condition. It may be that a visual condition is more in line with the way that ESP functions. Furthermore, a visual condition possibly adds motivation compared with the "token object" condition which could facilitate the psi task. Clearly the non-psychometry (visual) condition favors psi because it was more ecologically valid. Also, a substantial number of participants indicated having had some training in meditation or other techniques involving psychic abilities and/or an internal focus of attention. However, some problems were involved in terms of the participant´s impressions, some of them having difficulties expressing feelings, sensations, or making a description of the target person (through imagery or any extrasensorial way), or psychological resistance (fear of psi), or in terms of target person´s as judges, such as misinterpretations or of the participant´s statements.

At any rate, psychometry continues to be an area for exploration into ESP and there is a logical basis for further experimentation into this area. However, at this time it may require the services not only of parapsychologists but of –particularly– biologists, neurologists and physicists. Certainly a bio-physical approach to the problem of ESP seems called for.

Taking this into consideration, we think that the anomalous cognition with psychometry is a more complex cognitive process than we considered it to be. It seems to depend not only on the inductor object, but the very personality which has impressed it. Although it seems to be a mixture of both clairvoyance and telepathy, we designed a test in order to avoid a "clairvoyance" and "telepathy" hypothesis. Perhaps a psychometry procedure needs the support of a mind-to-mind connection to work better, or a sort of link between person-target, token-object and receiver, as occurs in a psychometry session with psychics. The link seems to be psychic (i.e. more emotional), physical (i.e. face-to-face) or both.

In this respect, perhaps the most fitting remarks about psychometry were written by G.N.M. Tyrrell (1947): "Object reading would appear to be evidence therefore, for the faculty of telaesthesia [telepathy initiated by the psychic, not the agent]. But there is one more lesson to be drawn from it, namely, that a close connection must exist between telepathy and clairvoyance. Somehow the presence of the physical object assists the operation of this telaesthetic form of telepathy. But the relation between a physical object and the extrasensory faculty is just the puzzle set by clairvoyance. If only we knew how the object affected the telaesthesia we should have made a great step towards understanding clairvoyance. But that is just what we do not know. All we can say is that it points strongly towards the view that there must be a vast amount of something behind the physical object as it appears to our senses. In fact, the sense presentation of the physical world must be the thinnest and most conventionalized of abstractions if we accept the evidence for clairvoyance and object reading."

Acknowledgements

The authors would like to thank the Bial Foundation for financial support of this research project. Thanks also are due to the generous collaboration of Juan G., Eduardo P., Romina M., and Magdalena V. who served as target persons.

References

Barrington, M.R.; Stevenson, I. and Weaver, Z. (2005). *A world in a grain of sand: The clairvoyance of Stefan Ossowiecki*. Jefferson, NC: McFarland.

Buchanan, J.R. (1885). *Manual of psychometry: The dawn of a new civilization, second edition.* Boston: Press of the Roxbury Advocate.

Bentley, W.P. (1961). Research in "psychometry" in the US and England. *International Journal of Parapsychology, 3*, 75-103.

Denton, W. (1863). *The soul of things*. Author: New York.

Hettinger, J. (1940). *The ultra perceptive faculty*. London: Rider.

Hettinger, J. (1948). A program for the investigation of psychometry. *Journal of Parapsychology, 12,* 90-95.

Myers, F.W.H. (1903). *Human personality and its survival of bodily death*. London: Longmans, Green & Co.

Osty, Eugène (1923). *Supernormal Faculties in Man*. London: Meuthen (Spanish version was used).

Pagenstecher, G. (1920). A notable psychometric test. *Journal of the American Society for Psychical Research, 14,* 386-417.

Pagenstecher, G. (1922). Past events seership: A study in psychometry. *Proceedings of the American Society for Psychical Research, 16,* 1-136.

Pagenstecher, G. (1924). *Aussersinnliche wahrnehmung*. Halle: Carl Marhold. (Italian version was used).

Pagenstecher, G. (1928). *Die geheimnisse der psychometrie: Oder hellsehen in die vergangenheit.* Leipzig: Oswald Mutze.

Pratt, J.G. (1960). Methods of evaluating verbal material. *Journal of Parapsychology, 24,* 94-109.

Pratt, J.G. (1969). On the evaluation of verbal material in parapsychology. *Parapsychological Monographs No. 10,* New York, NY: Parapsychology Foundation.

Prince, W.F. (1920). Experiments in psychometry. *Journal of the American Society for Psychical Research, 14*, 100-105.

Prince, W.F. (1921). Psychometric experiments with Señora María Reyes de Z. *Proceedings of the Society for Psychical Research, 15,* 189-314.

Prince, W.F. (1922). Psychometric experiments with Señora María Reyes de Z. *Journal of of the American Society for Psychical Research, 16*, 5-40.

Richet, C. (1922). *Traite de metapsychiquè*. Paris: Alcan. (Spanish version was used).

Rogo, D.S. (1974). Psychometry: Getting psychic impressions from objects. *Psychic, 5*(4), 19-22.

Roll, W.G. (1964). The "psi field." Presidential address read at the Seventh Annual Convention of the Parapsychological Association, Oxford, England.

Roll, W.G. (1967). Pagestecher's contribution to parapsychology. *Journal of the American Society for Psychical Research, 61,* 219-240.

Roll, W.G. (2004). Early studies on psychometry. *Journal of Scientific Exploration, 18*, 711-720.

Somogyi, S. (1974). Esperimenti di psicometria con un soggetto non-professionale. *Metapsichica, 33*, 124-127.

Tenhaeff, W.H.C. (1972). *Telepathy and clairvoyance: Views of some little investigated capabilities of man.* Springfield, Ill. Charles C. Thomas Publisher.

Tyrrell, G.N.M. (1947). The modus operandi of paranormal cognition. *Proceedings of the Society for Psychical Research*, *48*, 65-120.

Corresponding author: rapp@fibertel.com.ar

THE EFFECT OF REMOTE EMOTION ON RECEIVER SKIN CONDUCTANCE: A REPLICATION

Göran Brusewitz
Department of Psychology, University of Stockholm
Stockholm

The author would like to thank the John Björkhem Memorial Foundation whose financial support made these experiments possible.

INTRODUCTION

Research in parapsychology using psychophysiological measures, especially electrodermal activity (EDA) have primarily focused on the influence aspect of distant mental healing (DMILS). This is when, when one person attempts to influence another person's physiology, and influence is measured by changes in EDA (Braud, 2003; Braud & Schlitz, 1991; Delanoy, 2001; Schlitz & Braud, 1997). Very few studies have investigated whether it is possible to detect the effect of emotions experienced by a distant person using EDA.Using a mostly subconscious physiological measure enables us to avoid cognitive bias (Cacioppo, Berntson, Larsen, Poehlmann & Ito, 2004), as more rational, cognitive based measures of psi may inhibit the psi process.

Delanoy and Sah (1994) used skin conductance (SC) for a study to detect the effect of remote emotion and found higher activation for positive pictures compared to the neutral condition. The most widely used parameter in EDA is the mean level of the SC, but in a recent report, Schmidt, Schneider, Binder, Bürkle and Walach (2001) argue that this is not the most appropriate variable to detect psi. In a re-evaluation of two SC studies, Stevens (2000) found indications that the variance of the SC might be a more useful parameter than the mean level. Based on the variance of electrodermal activity, there were significant differences between any type of influence attempt and rest periods ($p<0.01$ and $p<0.002$, both 2-tailed for the two DMILS datasets used).

Delanoy and Sah (1994) refer to another unpublished study which also explored the use of emotional targets. This found significant overall psi-hitting, with significant scoring for the sending of positive emotions and approaching significant scoring for neutral emotions, while negative emotions elicited scoring very near MCE (Boswell, 1993). In a dream clairvoyance study by Dalton, Steinkamp and Sherwood (1999) it was found that emotional targets, particularly when they were negative were better targets (Sherwood & Roe, 2001, p. 101). This is perhaps not surprising given that spontaneous cases of dream ESP often seem to feature negative life events (e g Ullman, Krippner with Vaughan, 1989) and that emotions seem important in spontaneous psi experiences (e.g., L. E. Rhine, 1967).

Delanoy and Sah (1994) reason that senders may not want to experience a negative emotion or transmit such an emotion to a friend. Receivers may also be less open to receiving negative imagery. They finally mention some research indicating that negative emotions are less likely to produce psi-hitting than neutral or positive emotions in the conscious response measure (Johnson, 1971; Johnson & Nordbeck, 1972; Williams and Duke, 1980). Radin notes (personal communication, 2006-04-15) that for telepathy studies some have found that strong negative or positive (especially erotic) targets are not optimal because most participants don't like to report that they have had such impressions, or they unconsciously repress them.

The present study examines the effect of remote emotion on the SC of the receiver, when a sender is viewing emotional pictures. It is a conceptual replication of an experiment by Ramakers, Stevens and Morris (2005). There are two important differences between his study and this one. Firstly, Ramakers used 5 positive and 5 negative pictures (and 10 neutral pictures), while the present study involved 10 negative pictures and 10 presentations of a blank screen. Using only one kind of emotional picture (instead of splitting up in two kinds) would give more statistical power. It was not easy to choose negative or positive pictures for this study, since there is support for both kinds as being successful target as psi stimuli. The choice was made for the use of negative pictures because many researchers have reported some success with this choice (Bem, 2003; Dalton et al., 1999; Radin & Schlitz, 2005). It might be that success depends on which paradigm the pictures are used in, as some have employed emotional targets for influence (PK) and some for ESP (e.g., McCraty, Atkinson & Bradley, 2004; Radin, 2004 and the studies reviewed here). There may also be a difference between telepathy and precognition, e.g., if one can anticipate danger (pictures with threat or disgust) then one would have a better chance at survival (Bem, 2003; Radin, 1997).

The second difference was that Ramakers measured EDA for both the receiver and the sender, while in the present study, we measured the receiver only, mainly because of problems involved in arranging two sets of equipment.

Predictions

The prediction was that emotional target pictures viewed by a sender (with whom the receiver has a relationship) will alter the variance of the receiver's SC (main analysis). The hypothesis is that the mean standardized variance of the SC in the periods where an emotional picture is shown will be different from the mean standardized variance for rest periods, when no picture is shown.

METHODS

Participants

Thirty one pairs participated (59 individuals) in 60 experimental sessions, fulfilling the pre-set target number of trials. There were 17 male and 43 female receivers. The mean age of all receivers was 39 years (SD=15.7, range 14-70).

Most participants were recruited from an advertisement in *Dagens Nyheter*, a large circulation Swedish daily newspaper. The advertisement stated that priority would be given to recruiting persons with some kind of emotional or biological relationship.

The relationships between the couples were as follows: 16 friends, 15 parent-child, 2 brother-sister, 1 other family-relation, 22 married/cohabitants and 4 others. Eighteen couples had a biological relationship. The person who was a sender first would change and do a second session as receiver (and vice versa). If both people in a pair were over 18, they did two sessions, otherwise only one. For ethical reasons those under the age of 18 should not have to look at the pictures.

Materials

The experiment took place in the basement of the Department of Psychology, Stockholm University see Figure 1 for laboratory layout. The two rooms were old air-raid shelters, with two heavy, thick (together 35 cm) iron-doors between them. The EDA equipment was placed in the inner room, while the sender was positioned in another room, in front of a computer that would show target pictures. Relaxation music was played over the headphones of the receiver. There was approximately 4 m between the sender and the receiver. The distance from the wall to the table for the receiver was 1.85 m. SC from the receiver was recorded on two 24 bit serial port model devices from Biopac Systems Inc., model mp 100A, linked to a Power MacIntosh G3 computer..

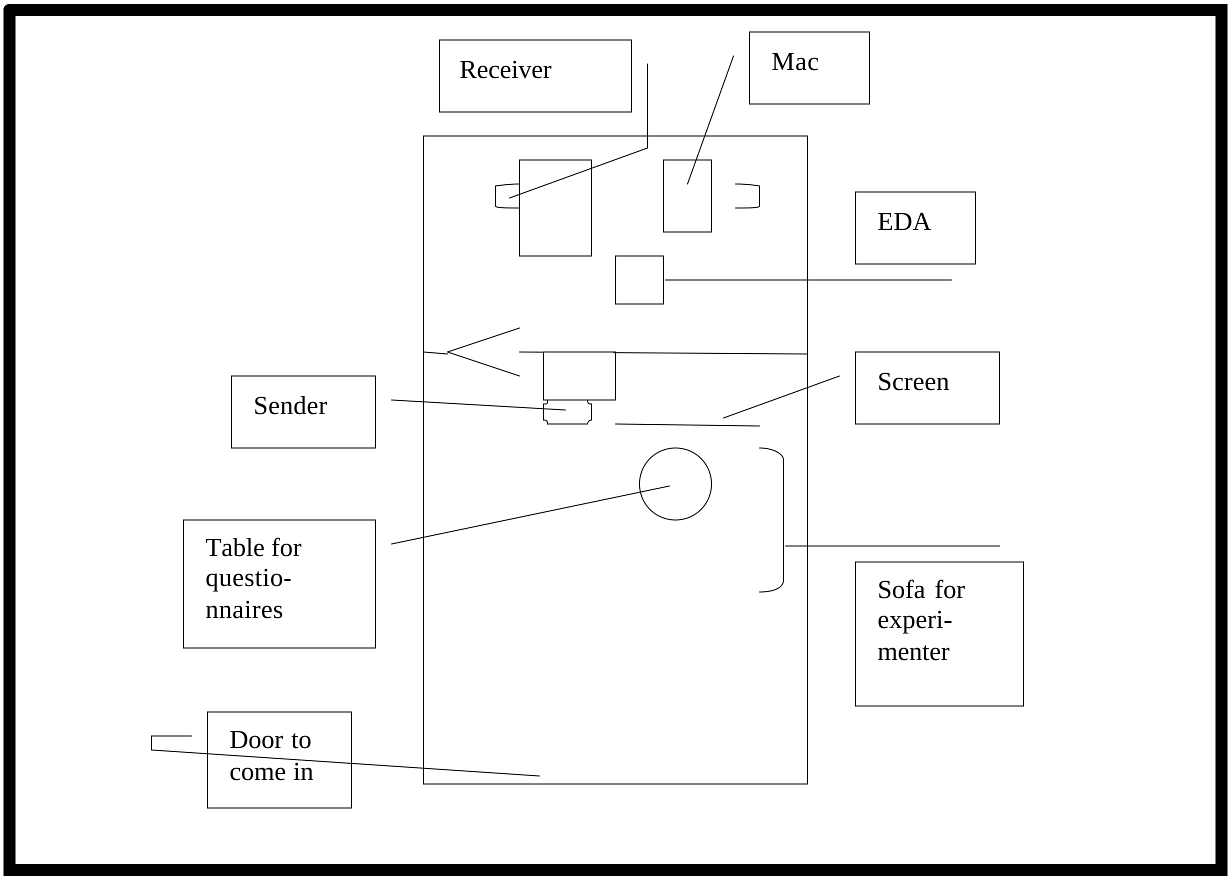

Fig. 1. A diagram of the two rooms employed in the experiment.

The 10 negative pictures were selected from International Affect Picture System (IAPS) and mixed with 10 blank exposures, i.e., no picture at all, following a suggestion from Ramakers (personal communication, 2006-01-23), who had noticed that their neutral pictures might not be functioning as neutral stimuli. The 20 "pictures" were arranged in blocks of 10 with 2 in each. Every block contained one negative and one neutral picture. The order within each block concerning which one that would be negative, was random, a choice carried out by the computer. In this way, expectancy effects could be avoided, since the receiver could not know when a negative picture was shown. The same pictures were used for each session. The choice of pictures to be included in the study was done by the author (GB) and a second experimenter (JW), in order to select pictures with high arousal and low valence. These values were found for all IAPS-pictures in a normative table, provided by Lang, Bradley and Cuthbert (1997). The aim here was to select pictures that were not too disgusting. This would ensure that the agent would cease experiencing the previous emotion and that the pictures would be varied.

A questionnaire was used that was similar to that of Ramakers. A pre-session part assessed belief in telepathy, possible occurrence of own paranormal experiences and the type and intensity of the relationship between sender and receiver. A post-session part asked the sender to rate their (emotional) reaction to each of the different pictures. The receiver's response was measured purely physiologically. The experimenter would later be able to match the EDA of the receiver with the ranks of the sender and also with value of arousal and valence of the pictures.

Procedure

The author was the experimenter for all sessions. A description of the study was given. Participants were informed that some pictures were very negative, and that they were free to withdraw from the study at any time. Next, both participants were shown the sender and receiver rooms. They were told that there were 10 blocks of pictures with two pictures in each, one emotional and one neutral (emo-neu or neu-emo), the choice being made by the computer. Participants were then given questionnaires and asked to fill out the pre-session questionnaire. The participants decided who was to take the role as sender in the first session. Both questionnaires were laid on a table, one marked for who would first be the sender, the other for the receiver. If participants had not decided on their initial role in the study, when they sat down, they chose the questionnaire in front of them, and in so doing selected their role. The sender was asked to pay full attention to the pictures and try to immerse themselves into the emotionality of each picture. They were asked to try to maintain the emotion for as long as it was on screen. The receiver was asked to relax and to try to keep his or her mind blank and open to the possibility of picking something up. The receiver was placed at the table in the inner room and electrodes were attached to the non-dominant hand (on the index and middle finger). Following this, s(he) was asked to be as calm as possible. Headphones were placed over the receiver's ears, the relaxation music was started (and played during all the session) and the volume adjusted. The experimenter then begun the EDA equipment and checked for some kind of response from the receiver. The sender, sat down in front of the computer screen in the other room. Noise reduction earphones were placed over the sender's ears to reduce external noise. When the receiver was ready to start, the experimenter made a mark on a channel on the equipment after about one minute after the equipment was started. He then left the room and closed both iron-doors between the rooms. The computer-programme was started 30 seconds after the time mark was made. In this way the timing of EDA equipment was synchronized with the computer timing.

Finally, the experimenter sat down in a sofa diagonally behind the sender and also behind a film screen. Every picture, as well as non-picture, was presented for 30 s, followed by a recovery period of 15 s. When the first session for each couple was completed, the participants exchanged roles, and the second session started. After both sessions, they were debriefed, filled a post-session questionnaire and received a token payment in the form of two tickets for a movie. The payment was to make them stimulated and interested in participating.

Security against cheating

The file with information about what picture in a block that was emotional and what was neutral was saved in a textfile in the computer. After each experiment this file was immediately sent to JW by email. In addition to this, at the end of each day, he also got the EDA-curve on a floppy disc. At no time during the handling of the EDA curves and (for the analysis) the excelfiles, did the experimenter know what periods on the EDA curve that corresponded to an emotional picture and what was a non-picture.

Analysis

Following the completion of all 60 experimental sessions, the mean value of SC as well as standard deviation (SD) was calculated (partly automatically, partly manually – by the author marking on the curve for each period of 30 s and have the Mac to calculate these two measures) for each picture and non-picture. These data were sent by email (in an excel file) to JW, who after all experiments co-ordinated this file with the file containing info about the order the pictures were shown.

The values used for the analysis were calculated in three steps: 1. The standard deviation (SD) of SC for each experiment was transformed to z-value. 2. The mean z-value was calculated for SD, for pictures as for non-pictures. All these calculations were done by JW. 3. The z-values were then the basis for testing the main hypothesis as well as for testing any post hoc hypotheses. The values of SC were calculated in the same three steps.

RESULTS AND DISCUSSION

Since this is an ongoing study, no final results can be reported in this paper. Beyond the main hypothesis, a number of appropriate post hoc analyses will be carried through, based on items in the questionnaire mentioned in Materials. The results of this study will hopefully give some insight into how telepathy of emotions might work. Questions concern the importance of age, sex, type of relation as factors like for example does an emotional or a biological relation perhaps facilitate telepathy? Also, does it make any difference what role you start with in the experiment? We will also evaluate if variance of SC is a better measure then the mean level. And finally, further research could give possibility to study the importance of having a sender, since there is some support that a sender might not be necessary. Since this study was primarily a replication, the choice was made to have a sender, even if this might contribute more noise. One good reason to have a sender is also that it is more stimulating for the participants.

ACKNOWLEDGEMENTS:

I would like to thank my supervisor Joakim Westerlund for assistance with the programming of the computer to show the pictures and for checking earlier drafts of this paper. I also want to thank Jan Dalkvist for discussions about possible location for the experiments, and Adrian Parker for assistance with the linguistic inspection. Also Malena Ivarsson for teaching me how to use and evaluate EDA-technology and –curves, and Lennart Högman for use of his EDA equipment.

REFERENCES

Bem, D. J. (2003). Precognitive Habituation: Replicable Evidence for a Process of anomalous Cognition. *Proceedings of Presented Papers: The Parapsychological Association 46th Annual Convention*, 6-20.

Boswell, D. (1993). *The effect of arousal on an exploratory extrasensory perception experiment*, Fourth year undergraduate thesis, University of Edinburgh.

Braud, W., (2003). *Distant mental influence*, Charlottesville, VA: Hampton Roads.

Braud, W. & Schlitz M. (1989). Methodology for the objective study of transpersonal imagery, *Journal of Scientific Exploration*, *3*, 43-63.

Braud, W. & Schlitz M. (1991). Consciousness interactions with remote biological systems: anomalous intentionality effects. *Subtle Energies*, *2*, 1-46.

Cacioppo, J T, Berntson, G G, Larsen, J T, Poehlmann, K M & Ito, T A. (2004). The psychophysiology of emotion. In M. Lewis and J M Haviland-Jones (eds.), *Handbook of Emotions* (pp. 173-191), New York: Guilford Press.

Dalton, K., Steinkamp, F. & Sherwood, S.J. (1999). A dream GESP experiment using dynamic targets and consensus vote, *Journal of the American Society for Psychical Research, 93*, 145-66.

Delanoy, D. (2001). Anomalous psychophysiological responses to remote cognition: The DMILS studies. *European Journal of Parapsychology*, *16*, 30-41.

Delanoy, D. & Shah, S. (1994). Cognitive and physiological psi responses to remote positive and neutral emotional states. In D. J. Bierman (Ed.). *Proceedings of presented papers of the 37th Annual Convention of the Parapsychological Association*, 128-137.

Johnson, M. (1971). An attempt to effect scoring behaviour in a group test of precognition by means of manipulation of motivation and by the use of individually assigned emotionally loaded target materials. *Research Letter* of the Parapsychological Division of the Psychological Laboratory, University of Utrecht, 15-32.

Johnson, M. and Nordbeck, B. (1972). Variation in the scoring behaviour of a “psychic” subject, *Journal of Parapsychology, 36*, 122 -133.

Lang. P. J., Bradley, M. M. & Cuthbert, B. N. (1997). International affective pictures system (IAPS): Instruction Manual and affective ratings. Technical Report A-4, The Center for research in Psychophysiology, University of Florida.

McCraty, R., Atkinson, M. & Bradley, R.T. (2004) Electrophysiological evidence of intuition: Part 2. A system-wide process? *Journal of Alternative and Complementary Medicine*, *10*, 325-336.

Radin, D., (1997). *The conscious universe: the scientific proof of psychic phenomena* (1st Ed.). New York: HarperCollins Publishers Inc.

Radin, D. (2004). Electrodermal presentiments of future emotions. *Journal of Scientific Exploration, 18***,** 253-274.

Radin, D. & Schlitz, M. (2005). Gut feelings, intuition and emotion: An exploratory study. *Journal of Alternative and Complementary Medicine, 11*, 85-91.

Ramakers, P., Stevens, P. & Morris, R. L. (2005). *The effect of remote emotion on receiver skin conductance*. Paper presented at the 29th International Conference of The Society for Psychical Research. 2nd – 4th September, University of Bath.

Rhine, L. E. (1967). *ESP in Life and Lab: Tracing Hidden Channels*. New York, New York: Collier-Macmillan

Schlitz, M.J. & Braud, W.G., 1997. Distant intentionality and healing: Assessing the evidence. *Alternative therapies, 3*, 62-73.

Schmidt, S., Schneider, R., Binder, M., Bürkle, D. & Walach, H. (2001). Investigating methodological issues in EDA-DMILS: Results from a pilot study. *Journal of Parapsychology, 65*, 59-82.

Sherwood, S. J. & Roe, C. A. (2001): A Review of Dream ESP Studies Conducted Since the Maimonides Dream ESP Programme, in *Psi Wars*. Getting to Grips with the Paranormal, a special edition of *Journal of Consciousness Studies* (Alcock, J. E. Burns, J. E. & Freeman, A), 10, (6-7) 2003.

Stevens, P. (2000). Human electrodermal response to human monitoring: classification and analysis of response characteristics, *Journal of Parapsychology, 64,* 391-409.

Ullman, M., Krippner, S., with Vaughan, A. (1989). *Dream telepathy: Experiments in Nocturnal ESP*. Jefferson NC: McFarland.

Williams, L. B. & Duke, M. (1980). Qualities of free-response targets and their relationship to psi performance. In W G Roll (Ed.) *Research in Parapsychology 1979*. (pp. 74-77). Metuchen,N.J.: Scarecrow Press, Inc.

Address for correspondence: Göran Brusewitz, Diligensvägen 98, 131 48 Nacka, Sweden. Email: goran.brusewitz@bredband.net

TELEPATHIC GROUP COMMUNICATION OF EMOTIONS: ANOUNCEMENT OF PREDICTIONS FOR AN ONGOING EXPERIMENT

Jan Dalkvist[1], & Joakim Westerlund[1]
[1]*Department of Psychology*
Stockholm University

INTRODUCTION

Since the spring of 1993, a series of group telepathy studies has been performed at the Department of Psychology, Stockholm University, with one of us (JD) as initiator. Based on the idea that strong emotional messages – e.g., signals of danger – may, for evolutionary reasons, be easier to transmit telepathically than are more neutral messages (Moss & Gengerally, 1969), the studies have all been concerned with transmission of emotions, as evoked by slide pictures.

The series of studies consists of two parts: an initial part, containing five individual studies (Studies 1-5), which mainly served to generate a set of hypotheses (Dalkvist & Westerlund, 1998), and a second part, in which these hypotheses were tested in a comprehensive replication study (Westerlund & Dalkvist, 2004).

The outcome was not positive. A new finding was revealed, however, which we thought motivated a re-analysis of data from both the old and the new study. The purpose of this paper is to present predictions from these analyses – predictions that are currently being tested in an ongoing experiment.

OVERVIEW OF PREVIOUS STUDIES

The original studies

A total of 337 participants, 222 females and 115 males, with a mean age of 26.7 yrs (range: 18-65 yrs) took part in the five original studies (Dalkvist & Westerlund, 1998). Most of the participants were undergraduate psychology students at Stockholm University, who chose to participate in the study as part of their course requirements. The studies comprised from 2 to 9 single experiments each, twenty-four in all; the mean number of participants per experiment was 13.75.

Thirty slide pictures – 15 with positive motifs (e.g., nature pictures and pictures of happy people) and 15 with negative ones (e.g., pictures of traffic accidents or starving children) – were used as stimuli (for a complete description, see Dalkvist & Westerlund, 1998).

With a view to obtaining a psychological description of the pictures used, they were rated on six different scales (by participants other than those taking part in the main experiments). All of the pictures were rated with respect to how (a) pleasant/unpleasant, (b) involving, (c) familiar and (d) perceptible (easy to apprehend) they were. In addition, the 15 negative pictures were rated with respect to how (a) compassion-arousing and (b) repulsive they were, and the 15 positive pictures with respect to how calm or exciting they were. Moreover, on the basis of the four "emotional" scales for negative pictures, a scale of negative emotionality was constructed.

When the participants arrived at the laboratory, they were (quasi)randomly divided into two groups, one sender group and one receiver group. The senders and the receivers were sequestered in two sound-attenuated rooms, with one room between them. The two experimental rooms were connected to each other by a signal device; a lamp in the receiver room could be turned on and off from the sender room. There were two experimenters in the sender room and two in the receiver room.

Before the experiment started, the participants rated their belief in telepathy on a three-point scale. In Experiments 4 and 5, corresponding ratings were also made after the experiment, but on a seven-point scale, to obtain more fine-grained data.

The slides were presented in random orders, with a new order for each group of senders. The senders' only task was to look at the pictures and to "hold on to" the feelings evoked by the respective pictures as long as they were being shown. The receivers were instructed to guess whether a given picture was positive or negative (they were informed about the number of slides, but not that the number of positive and negative pictures was the same). One of the experimenters in the receiver room watched the signal lamp and reported to the receivers when a new picture was shown to the senders. Each picture was shown for 20 seconds, with an inter-stimulus interval of about 0.5 seconds.

When all 30 pictures had been shown, the participants changed rooms, and those who had served as senders now served as receivers and vice versa. Thus, each experiment consisted of two separate sessions, a first one in which half of the participants started as senders and the other half as receivers and a second session in which the roles were reversed, using the same stimulus pictures presented in a different random order.

Hit rate was related to two major types of moderator variables: (a) person or situation factors and (b) stimulus factors. The person factors were of two types: demographic variables and response style variables. The demographic variables were: (a) gender, (b) age and (c) belief in telepathy as measured at the beginning of the experiment (on a three-point scale) and at the end of the experiment (on a seven-point scale). The response style variables were: (a) number of negative guesses and (b) repetition avoidance, defined as the number of times the subject shifted from one type of response, i.e., "positive picture" or "negative picture", to the other. The situation variables were: (a) sender/receiver order and (b) number of receivers.

The stimulus factors consisted of (a) rated characteristics of the stimulus pictures and (b) series positions (for example, the first picture versus all other pictures).

Data analyses were performed both by means of conventional statistical methods and by means of a so-called Monte Carlo method, a simulation technique that, in contrast to conventional statistical methods, does not require that any particular statistical assumptions be satisfied.

Together, the results from the five original studies seemed to support the hypothesis that telepathy exists. For example, several significant results were obtained when analyzing effects of person factors, the most consistent finding being that participants who believed in telepathy had a lower hit rate than that expected by chance.

There were some problems with the results, however. One was that, for the most part, the studies were explorative in character and had not been planned to test particular hypotheses. Thus, except for an initial hypothesis of an (unspecified) effect of belief in telepathy on hit rate, all the findings were made post hoc during the course of the studies. Another problem was that none of the five experiments was perfectly controlled. As a matter of fact, the experiment was successively improved during the course of the studies, particularly in Study 4.

The replication study

On the basis of the results of the five above studies, eight predictions were formulated and tested in the replication study. These predictions were all based on statistically significant (or, in one case, marginally significant) results obtained when data from the five studies were combined. The predictions were announced in *the Journal of Parapsychology* (Dalkvist & Westerlund, 1998) before the data analyses had started.

The new study was an exact replication of the latest of the five original studies, except that two minor further control measures were adopted (see Westerlund & Dalkvist, 2004) and comprised 432 females and 173 males, 605 participants in all, with a mean age of 27 yrs. As before, the large majority of the participants were undergraduate psychology students at the Department of Psychology, Stockholm University, who chose to participate in the study as part of their course requirements. There were 47 single experiments in all. The number of participants per experiment ranged from 5 to 19, with a mean number of 12.9.

None of the eight predictions was borne out (Westerlund & Dalkvist, 2004), which strongly argued against the possibility that some psi-phenomenon had been at work.

In a post-hoc analysis, in order to find an explanation of the failure to confirm any of the eight predictions, two physical moderator variables were entered: (a) local sidereal time (LST), an astronomical time and space measure, which indirectly is related to the magnitude of cosmic radiation that reaches the earth, and (b) disturbances in the global geometric field, as measured by the *ap*-index. For a large number of different studies, performed on the northern hemisphere Spottiswoode and May (1997) found both of these measures to be systematically related to the effect size of the studies. Moreover, in a subsequent analysis of the same database, Spottiswoode (1997) also found a relationship between LST and the correlation between effect size and the activity of the earth's magnetic field (GMF), partly mirroring the relationship found for the effect size itself. The correlations were shown to fluctuate around zero except for experiments conducted (plus/minus) 1-2 hours around 12.9h LST, for which the correlations were highly negative.

Values of the *ap*-index for all 3-hour intervals between 1994 and 1999 were collected from the World Data Center C1 for Geomagnetism on the World Wide Web. For each single hour, the *ap*-index for the 3-hour interval encompassing the current hour was used. Because the distribution was markedly skewed, the values were logarithmized. The times for the *ap*-values were displaced one hour forward in time, in order to correct for the difference in time between UTC and Swedish time.

Based on the findings of Spottiswoode and May (1997), showing particularly good performance around 13:30 h LST, LST was divided into two intervals, one interval of "good" LST, ranging from 11:00 h LST through 16:00 h LST and one interval of "bad" LST, covering all other hours.

However, we did not succeed in explaining our failure in terms of differences in LST or *ap*-index.

METHOD

Even though none of the eight predictions was borne out, a significant unexpected result was obtained. In the original studies, a significant interaction effect was obtained between gender and receiver order, with a positive average hit rate for the males when they started as receivers and a positive average hit rate for the females when they started as senders. However, instead of a significant interaction effect between gender and receiver order, a significant main effect of receiver order ($F_{1,601} = 4.842$; $p = 0.028$) was obtained, with a significant negative deviation (-0.34) from mean chance expectation (M=15) for participants who started as receivers ($t_{279} = -2.143$, $p = 0.033$) and an almost significant positive deviation (0.27) for those who started as senders ($t_{324} = 1.82$, $p = 0.069$).

Admittedly, this result was not predicted to occur, and as many as eight different predictions were tested in the study, meaning that the result did not reach significance when correction was made for number of tests. Nevertheless, inspired by earlier reports of effects of receiver order in Ganzfeld research (Haraldsson, 1980, 1985), we decided to carry out a follow-up analysis of the present receiver order effect, based both on the original data set (with the three first, less well controlled, studies removed) and on data from the replication study. This follow-up analysis is the subject of the present research brief. In the following, we will collectively refer to Study 4 and 5 as the "old" study and to the replication study as the "new" study.

The analyses described below were not carried out at the individual level, as before, but at the group level. Specifically, each session (one of the two parts of a single experiment) was used as the unit of analysis, and session means as input in the statistical analyses. One methodological advantage of analyzing the present data at the group level, with each session as the unit of analysis, is that the two receiver orders can be compared in pairs, for example by calculating the correlation between the two receiver orders across experiments. Such analyses are, of course, impossible to conduct at the individual level, because each individual participant either starts as receiver or as sender. Another methodological advantage of analyzing the present data at the group level with each session as the unit of analysis is that we avoid a stacking effect (Thouless & Brier, 1970).

RESULTS

For the new study, a significant correlation was obtained between mean hit rate for groups of subjects who started as senders and groups who started as receivers ($r_{41} = 0.35$, $p = 0.022$, two-tailed). This correlation reflects a difference in hit rate among the single experiments. However, no correlation was obtained between the two receiver orders for the old study.

The correlation between groups of participants who started as receivers and groups who started as senders allowed us to use a more powerful statistical test than that used before to test the difference in hit rate between the two receiver orders, namely a t-test for *dependent* samples instead of a t-test for *independent* samples. For the new data set, the test showed a very clear difference in mean hit rate between the groups who started as receivers and the groups who started as senders ($t_{42} = 3.74$; $df = 42$; $p = .001$).

To test whether the old and the new study differed significantly with respect to the receiver order effect, a two-way ANOVA with repeated measures was carried out with study (old/new) and receiver order as independent variables and mean hit rate as the dependent variable. A significant interaction effect between study and receiver order ($F_{1,\,58} = 5.28$, $p = 0.025$) was obtained.

How can this difference be explained? In an attempt to answer that question, a series of t-tests was carried out with study (old/new) as the independent variable and a set of moderator variables as dependent variables. Except for receiver order, all previous moderator variables, including *ap*-index and LST (which were not considered in any of the five original studies), were tested. The old and the new study differed significantly on only one of the nine variables: fluctuations in the geomagnetic field ($t_{122} = 7.92$, $p < 10^{-13}$), with a considerably higher average degree of fluctuation in the old study (mean of ln ap-index = 3.44; SD = 0.72) than in the new one (mean of ln ap-index = 1.97; SD = 0.99). Level of geomagnetic fluctuation thus turned out to be a promising variable for explaining the difference in receiver order effect between the old and the new study.

To test whether the difference in geomagnetic fluctuation between the old and the new study might explain the interaction effect between study and receiver order, *ap*-index was entered as a co-variate in the above-mentioned two-way ANOVA (the effect of ap-index was removed). This resulted in a complete disappearance of the interaction effect between study and receiver order. Instead, a significant interaction effect was obtained between receiver order and *ap*-index ($F_{1,57} = 5.26$, $p = 0.026$). Thus, it seemed as if the difference in receiver order effect between the old and the new study could be totally explained in terms of the difference in fluctuation of the geomagnetic field between the two studies.

The possibility that the receiver order effect was dependent on geomagnetic fluctuations received further support from a correlation analysis. A significant negative correlation between the two variables was obtained for the new data set ($r_{41} = -0.307$, $p = 0.045$, two-tailed). Likewise, a negative corresponding correlation of about the same size was obtained for the old data set, but this correlation did not reach significance ($r_{15} = -0.29$, $p = 0.259$, two-tailed).

We also explored the possibility that the occurrence of a correlation between the receiver order effect and *ap*-index was dependent on the presence of a ¨good¨ LST, according to Spottiswoode´s previously mentioned findings (Spottiswoode, 1997). This was done using the whole data set to obtain sufficiently large variations in LST and ap-index. For our definition of "good" LST (see above), a very high, strongly significant correlation ($r_{10} = -0.712$, $p = 0.009$, two-tailed) was obtained. However, a significant, although less strong correlation ($r_{45} = -0.32$, $p = 0.028$, two-tailed), was also obtained for all other LSTs. There was no significant difference between the two correlations (z=1.53).

To find out whether or not *ap*-index was the only moderator variable related to the receiver order effect, a step-wise multiple regression analysis was performed using the same moderator variables as above as independent variables and the difference in hit rate between groups starting as receivers and groups starting as senders as the dependent variable. This was carried out on the whole data set to obtain as large a variation in ap-index as possible. Two of the nine independent variables were selected in the analysis. As expected, the first selected variable was ap-index with an associated negative regression weight (beta = -0.39, t =3.40, $p = 0.001$). The second variable was the average number of negative guesses, which, in contrast to ap-index, was associated with a positive regression weight (beta=0.31, t = 2.66, *p* = 0.01). Together, the two variables explained more than 20% of the variance in the dependent variable (adjusted $R^2 = 0.22$; $F_{2,57} = 9.41$, $p = 0.0003$).

CONCLUSION

Let us start by summarizing the main findings of the present study. The starting point was a post hoc finding from the previous study: Participants who started as senders performed above expectancy, while subjects starting as receivers performed below expectancy, the difference between the two receiver orders being clearly significant. There was no corresponding receiver order difference in earlier data, however. Was this discrepancy a real one or was the receiver order difference attributable to sampling errors? In an attempt to answer that question, a systematic series of data analyses were carried out. Apparently, the discrepancy between the old and the new data sets could be explained by the fact that the geomagnetic fluctuations, as measured by the ap-index, were larger in the old study than in the new one.

Ap-index did not only seem to explain the difference in the receiver order effect between the old and the new study. In the new data set, *ap*-index turned out to be negatively related to the difference in hit rate between groups of subjects starting as senders and groups starting as receivers. A non-significant correlation of about the same size and in the same direction was obtained for the old study. Taken together, our findings on the *ap*-index suggested that the receiver order effect was dependent on *ap*-index, such that the effect diminished as *ap*-index increased. This suggestion was strengthened by our failure to find any time scale that was related to the present receiver order effect, thus making it unlikely that the correlation between the receiver order effect and *ap*-index was mediated by some other time-related variable.

As indicated by a step-wise multiple regression analysis on the whole data set, one additional variable was significantly related to the receiver order effect, namely, a response style variable: number of negative guesses, which in contrast to *ap*-index was positively related to the receiver order effect. This relationship was weaker than that for *ap*-index, however.

The above findings are, of course, only suggestive and could well be the result of “data snooping” rather than being genuine. Nevertheless, we judged the findings to be sufficiently interesting to warrant a follow-up in a new prediction study. As mentioned earlier, this study is ongoing at this time, and is planned to be finished next year. Data are being collected in the same way as in the previous study, and they will be analyzed at the group level in the same manner as in the present study.

Two predictions will be tested. The first is:

P1. A negative correlation will be obtained between the difference in mean hit rate between groups of subjects starting as senders and groups starting as receivers and *ap*-index, with a positive difference for low levels of *ap*-index, but not for high levels.

The second prediction concerns the suggested effect of the response style variable on number of negative guesses:

P2. Independent of *ap*-index, a positive correlation will be obtained between the difference in hit rate between groups of participants starting as senders and groups starting as receivers and mean number of negative guesses.

Because a significant result from *any* of the two predictions above would support the psi-hypothesis, we have a clear global null hypothesis and should correct for multiple analysis with a Bonferroni correction. Using an alpha of .05 for the global null hypothesis, we will therefore test each of the two hypotheses above using an alpha of .025. We will use two-tailed tests.

Although we are far from convinced that either of the two predictions will be confirmed, we look forward at seeing the results with some excitement.

References

Dalkvist, J. & Westerlund, J. (1998). Five experiments on telepathic communication of emotions. Journal of Parapsychology, *62*, 219-253.

Haraldsson, E. (1980). Confirmation of the percipient-order effect in a plethysmographic study of ESP. Journal of Parapsychology, *44*, 105-124.

Haraldsson, E. (1985). Perceptual defensiveness, ganzfeld and the percipient-order effect: two experiments. European Journal of Parapsychology, *6*, 1-17.

Moss, T. & Gengerelli, J.A. (1968). ESP effects generated by affective states. Journal of Parapsychology, *32*, 90-100.

Spottiswoode, J., & May, E. (1997). Anomalous cognition effect size: Dependence on sideral time and solar wind parameters. Proceedings of the 40th Annual Convention of the Parapsychological Convention, 399-409.

Spottiswoode, S.J.P. (1997). Geomagnetic fluctuations and free-response anomalous cognition: A new understanding. The Journal of Parapsychology, *61*, 3-12.

Thouless, R.H. & Brier, R.M. (1970). The stacking effect and methods of correcting for it. Journal of Parapsychology, *34*, 124-128.

Westerlund, J. & Dalkvist, J. (2004). A test of predictions from five studies on telepathic group communication of emotions. Proceedings of the 47th Annual Convention of the Parapsychological Convention.

DEVELOPING EXPERIENCE-SAMPLING METHODOLOGY TO EXPLORE PSI IN 'EVERYDAY LIFE'

Nicola J. Holt[1]
Centre for the Study of Anomalous Psychological Processes
University of Northampton

INTRODUCTION

This paper describes the development of experience-sampling methodology (ESM) to test for psi outside of the laboratory, briefly outlining the protocol for an ESP study using ESM, for which data are currently being collected. ESM is "a research procedure for studying what people do, feel, and think during their daily lives" (Larson & Csikszentmihalyi, 1983, p. 41). It is a quasi-naturalistic method that involves participants providing self-reports about the nature and quality of their experience as they go about their everyday activities. Reporting is either triggered by random signals over a set period of time (signal-contingent sampling) or by a particular environmental or psychological stimulus (event-contingent sampling). The methodology has three broad characteristics: participants record information in a 'natural setting'; in 'real time' (i.e. as close as possible to a signal or event); and on repeated trials (Conner, 2005). As such, ESM is concerned with ecological validity, recognising the importance of the contexts in which psychological processes unfold. Through the immediate reporting of cognition, affect and behaviour, it is thought to minimise problems associated with the fallibility of memory in the reconstruction of events (Bolger, Davis & Rafaeli, 2003). Finally, through repeated measurements, the goal is to expose "regularities in the stream of consciousness" (Csikszentmihalyi & Larson, 1987, p. 527).

ESM can explore such experiential (or temporal) regularities on three levels: 1) variation within an individual's experience (at the 'stimulus' level); 2) differences between groups of individuals based on average experiences (the 'person level'); and 3) the interaction between the person and stimulus levels, e.g. whether different groups show different patterns of experiential variability. For instance, ESM has been used in case studies (e.g., exploring individual experiences of psychopathology, de Vries, 1992), with larger samples (e.g., to assess experiences of stress at work and how these interact with situational and personality variables, Miner, Blomb & Hullin, 2001) and to examine the experiences of different individuals within an interpersonal setting (e.g., family dynamics, Almeida, Wethington & MacDonald, 1999). Further, ESM has been applied in behavioural medicine and health research, with increased focus on measuring physiological variables in addition to self-reports. Ambulatory monitors have been used to measure heart-rate and blood pressure (e.g., Jamner, Shapiro & Alberts, 1998) and physical movement tracked with wrist actigraphs (e.g., Shapiro & Goldstein, 1998). Multichannel recorders can jointly track indices of heart-rate, blood pressure, respiration, and physical activity (see Fahrenberg & Myrtek, 1996 for a review).

Available technology has developed over the last few years, enabling the use of personal digital assistants (PDAs) and mobile phones to record experience, rather than earlier paper and pencil methods with accompanying 'beepers' (see Feldman-Barrett & Barrett, 2001, for a review). The benefits of such technology include the recording and accurate storage of the exact time that a report was made (it is 'time-stamped'), the recording of reaction times to questions, and the randomization of the presentation order of questions to help prevent boredom and stereotyped responses over time. In addition, data can be stored so

[1] The author would like to gratefully acknowledge a Perrott-Warrick grant, which enabled the purchase of equipment for this study.

that the participant cannot amend any information at a later date, which is especially pertinent to psi research where security is a sensitive issue.

ESM and burgeoning developments in supporting technology may inspire novel and exciting research designs in parapsychology. ESM is very flexible and it is possible to envisage both the assessment of SPEs as they arise (in longitudinal designs) and ambient ESP quasi-experiments (e.g., with new software a controlled psi task could be initiated at random intervals). The author is currently experimenting with such protocols. Data are being collected with an ESP-ESM design. This may be seen as an adaptation of the 'ganzfeld' protocol, except that instead of being in a perceptual-isolation for 35 minutes, the 'receiver' mentates when, where and as frequently as, they like over a 24-hour period. It is hoped in this way to capture natural variations in states and to explore how these relate to psi-performance. Further, such a methodology might both: avoid demand characteristics of lab based psi tasks (such as extraverts performing well in the ganzfeld, Honorton, Ferrari & Bem, 1992); and reduce the impact of any experimenter-effect. While ESM has not previously been applied to the study of psi, it has precedents in psi research that has allowed participants to take part in their own space and time (e.g., Delanoy, Watt and Morris, 1993; Ertel, 2004). It has been suggested that such 'take-home' protocols may be 'psi-conducive'. For instance, participants might be better able to relax in their chosen environment (Ertel, 2004); and/or the freedom, spontaneity and choice of when, how and where to take part may promote feelings of competence and motivation (Delanoy et al., 1993).

METHOD

Design

The present study is intended to explore the utility of using event-contingent experience-sampling methodology within an ESP protocol, where 'receivers' record impressions about an ESP target at their own impetus. Thirty participants will be recruited with stratified opportunity sampling to obtain a group with varying degrees of artistic involvement. The experimenter (NH) will act as a 'sender'. The study further includes a judging stage using two blind independent judges, where the target clip and three decoy clips are rated for their similarity to a 'receiver's' mentation. Analyses will be made at two levels: the group level – looking at overall psi-performance and psychometric correlates of this (focusing on creativity, following from Holt, Delanoy & Roe, 2004); and an exploratory analysis will examine the interaction between the group level (psi-performance) and the individual level (state of consciousness). The assessment of overall psi-performance will be based on the sum of target ranks awarded; the dependent variable for personality and exploratory analyses will be the *Z*-score of target ratings.

Apparatus and Materials

Experience Sampling Program (ESP), version 4 (Barrett & Feldman-Barrett, 2005). This is free software for Palm PDAs that has been designed specifically for ESM research. It displays questions, records responses (as hidden files) and measures reaction times (in respond to each question). ESP includes two software packages: 'ESP', a palm application that interacts with participants; and 'ESP desktop', a PC application for designing experiments and configuring the ESP settings, which runs on Windows.

Tungsten T personal digital assistant (PDA) by Palm Inc (2002). The dimensions of this are 7.4 x 9.6x 1.3 cm, with a high-resolution colour display screen measuring 5.3 x 5.3 cm. It runs on Palm OS v5 and has a Texas instruments OMAP1510 processor, with 16 MB of internal memory. The PDA has a microphone and its installed software includes 'Voicememo', which enables up to 55 minutes worth of audio mentation to be recorded (without a memory expansion card). The software also includes 'Notepad', which enables words or images to be recorded, by writing with a stylus (a metal 'pen' which is stored inside the PDA) on the screen. The PDA has rechargeable batteries and a portable charger in which to store it when not being used.

Experience sampling questionnaire. ESP was configured to display and store responses to 32 questions that related primarily to the state of consciousness in which a potential ESP impression was recorded. These were based on: the phenomenology of consciousness inventory, PCI (Pekala, 1991), 21 items assessed 12 dimensions (positive affect, negative affect, altered experience, imagery, inward absorbed attention, self-awareness, internal dialogue, altered state, rationality, volitional control, memory and arousal) (duplicate items from the PCI were not included as the ESP needed to be as brief as possible); 2 items concerned environmental context (described with free response text) and degree of solitude; 9 items were taken from post-trial ganzfeld questionnaires (Sargent, 1980; Simmonds & Holt, submitted) and primarily focused on qualities of mental imagery (e.g. its familiarity, spontaneity and its apparent source). Most responses involved moving a point on a slider from 0 to 100% to indicate degree of agreement or disagreement with a statement.

The U of N target pool, consisting of 116 minute-long digital video clips that were drawn from commercial films to reflect a range of emotions and themes. Clips were arranged in 29 sets of 4 so that members of a set were as distinct as possible and were stored digitally as MPEG files, labelled 1a, 1b, 1c etc. Randomisation for choice of the clip was achieved using the Visual Basic pseudo-random algorithm (rnd), seeded using the timer at the start of the automated ganzfeld computer system developed by Dr Paul Stevens (RANDOMIZE TIMER). Once the 'Start' button has been pressed, the computer first selects a target set, then selects one of the four clips within that set. The clips were presented via Media Player v7.

A battery of creativity measures (as described by Holt, Delanoy & Roe, 2004).

Procedure

At an initial meeting with a participant the aims of the study are described to them by the experimenter (NH), who attempts to create a good rapport. Subsequently, the participant is shown how to use the PDA and guided through this with a practice session. They are then given the PDA and a booklet describing the study aims and practical details, in case they forget anything, and the e-mail address of NH should they experience any difficulties and need to re-arrange or cancel the trial.

In the ESP-ESM study participants will carry a PDA with them for 24-hours. When they feel like taking part in a trial (e.g. recording a daydream, thought, dream or experience) the participant switches on the PDA and records this impression or experience either through Voicememo or Notepad (as they prefer). They then initiate the electronic 'ESP' questionnaire, which records responses regarding their state of consciousness and situation. The participant is asked to record at least one impression, which they may initiate at any time. As a security measure the participant will not be able to access any of their experience-sampling forms and mentations will be 'time-stamped'.

On the trial day a target video-clip is randomly selected by the autoganzfeld programme on a laptop computer. NH watches this and attempts to send information about it to the participant at spontaneous times throughout the day. The sending is done at spontaneous times for purposes of convenience and ecological validity. A record is kept of 'sending times' and the information focused upon. The target video-clip plays only when NH is watching it. There is no contact between the experimenter and the participant until the debriefing session, unless the participant emails NH to cancel the session.

The participants are informed that they will see the target clip in the debriefing session. They are told that no attempt is being made to distinguish between whether any psi is due to telepathy, clairvoyance or precognition; hence they may frame the task cognitively as they prefer.

The final stage of each trial involves the participant meeting with the experimenter for a debriefing session as soon as possible after the trial day. The PDA is returned to the experimenter and then both discuss the study and compare the impressions that the receiver has recorded to the target clip, which is now revealed. The participant is also shown the experimenter's sending record.

The impressions that the receiver generated are used by two blind independent judges to identify the target from among three decoy clips, by giving a confidence rating (0 to 100%) for each clip, representing certainty that it was the target. This is done for both each separate mentation and holistically for all the mentations, considered as a collective, across the 24-hour period.

RESULTS AND DISCUSSION

Data are currently being collected for the study briefly outlined above, and it hoped that at the PA this will be presented and the efficacy of the ESP-ESM evaluated.

REFERENCES

Almeida, D., Wethington, E., & MacDonald, D. (1999). Daily variation in paternal engagement and negative mood: implications for emotionally supportive and conflictual interactions. *Journal of Marriage and Family, 63,* 794-806.

Barrett, D. & Feldman-Barrett, L. (2005). *ESP, the experience-sampling program*. Obtained from http://www.experience-sampling.org/esp/.

Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: Capturing life as it is lived. *Annual Review of Psychology, 54*, 579-616.

Conner, T. (2005). *Experience sampling resource page*. Obtained from http://psychiatry.uchc.edu /people/postdocs/conner/esm.php

Csikszentmihalyi, M. & Larson, R. (1987). Validity and reliability of the experience-sampling method. *The Journal of Nervous and Mental Disease, 175,* 526-536.

Delanoy, D., Watt, C. & Morris, R. (1993). A new methodology for free-response ESP testing outwith the laboratory: Findings from experienced participants. *Proceedings of the 36th Annual Parapsychological Association Convention,* 204-223.

Fahrenberg, J., & Myrtek, M. (1996). (Eds.). *Ambulatory assessment: Computer assisted psychological and psychophysiological methods in monitoring and field studies*. Seattle, WA: Hogrefe and Huber.

Feldman-Barrett, L., & Barrett, D. (2001). An introduction to computerized experience-sampling in psychology. *Social Sciences and Computing Review, 19,* 175-85.

Holt, N., Delanoy, D. & Roe, C. (2004). Creativity, subjective paranormal experiences and altered states of consciousness. *Proceedings of the Parapsychological Association 47th Annual Convention,* 433-436.

Honorton, C., Ferrari, D., & Bem, D. (1992). Extraversion and ESP performance: A meta-analysis and a new confirmation. *Research in parapsychology 1990* (pp. 35-38). Metuchen, NJ: Scarecrow Press.

Jamner, L., Shapiro, D. & Alberts, J. (1998). Mood, blood pressure, and heart rate: strategies for developing a more effective ambulatory mood diary. In D. Krantz (Ed.), *Technology and methods in behavioral medicine,* pp. 195-220. Mahwah, NJ: Erlbaum.

Larson, R. & Csikzmentmihalyi, M. (1983). The experience-sampling method. In H. Reis (Ed.), *New directions for naturalistic methods in the behavioral sciences.* San Francisco: Jossey-Bass.

Miner, A., Blomb, T., & Hulin, C. (2001). Mood at work: experience-sampling using palmtop computers. In H. Weiss (Chair), *Experience-sampling methods (ESM) in organizational research.* Symposium conducted at the 16th Annual Conference of the Society for industrial and Organizational Psychology, San Diego, CA.

Pekala, R. (1991). *Quantifying consciousness: An empirical approach.* New York: Plenum Press.

Shapiro, D., & Goldstein, I. (1998). Wrist actigraph measures of physical activity level and ambulatory blood pressure in healthy elderly persons. *Psychophysiology, 35*, 305-12.

Sargent, C. (1980). *Exploring psi in the ganzfeld.* New York: Parapsychology Foundation.

Simmonds, C. & Holt, N. (Submitted). Trait, state and psi: An exploration of the interaction between individual differences, state preference and psi performance in the ganzfeld and waking ESP control. *Journal of the Society for Psychical Research.*

Vries de, M. (1992). The experience of psychopathology: Investigating mental disorders in their natural settings. New York: Oxford University Press.

ARE PSYCHICS PERCEIVED TO BE MORE ACCURATE AND PERSUASIVE THAN NON-PSYCHICS?

Craig D. Murray[1] & Ciarán O'Keeffe[2]
[1] *School of Psychological Sciences, University of Manchester*
Manchester, United Kingdom
[2]*Department of Psychology, Liverpool Hope University*
Liverpool, United Kingdom

INTRODUCTION

Previous research has found that people who claim to have psychic or mediumistic abilities use language in a different manner to people who do not claim to have these abilities (e.g., O'Keeffe & Alison, 2000; Reiser & Klyver, 1982). For instance, O'Keeffe and Alison (2000) found that psychics used a wider variety of linguistic devices, such as 'fishing' and 'staging' on a psychic detection task than non-psychics.[1] Psychics and non-psychics did not differ in the number of correct statements they produced, but psychics were found to make a higher number of inaccurate statements.[2] Similarly, work by Wooffitt (2001a, 2001b) has elaborated the sequential turn-taking structure in medium-sitter readings and how this is organised in a manner that makes it more likely that the medium's statements will be accepted as accurate and obtained from a paranormal source. However, while this previous work has highlighted linguistic devices used by people claiming psychic abilities, to date no experimental research has been conducted to examine if the descriptions or readings given are perceived by the listener as any more accurate or inaccurate than those given by non-psychics. It is this issue that the present research addresses.

The present study used audio excerpts of psychics' and non-psychics' descriptions regarding a homicide and asked participants to rate each excerpt for perceived accuracy and persuasiveness. In one information condition participants were told they might be listening to "psychics and non-psychics" and in another to "people who may or may not have experience in helping the police investigate criminal offences". It was hypothesised that:

(1) Psychics would be perceived as more accurate and persuasive than non-psychics;

(2) Participants who were told that they might be listening to psychics would give lower accuracy and persuasiveness ratings to all excerpts than participants who were not told this.

METHODS

Participants

The study employed a first-year psychology student sample at the University of Manchester. A total of 41 students (39 females, 2 males; mean age 19, SD = 2.66) took part (24 in Condition 1, 17 in Condition 2). Posters within the Division of Psychology asked for participants interested in crime detection to take part in a 1-hour long study during which they would hear different people describe a particular crime and the perpetrator(s), after which they would be asked to fill in a short questionnaire. In return for taking part students received credits (n=4) which they were required to earn via research participation as part of their degree course.

[1] It is important to note that we do not take such use *ipso facto* to be an intention to deceive or mislead the listener.
[2] Psychics also produced readings three times as long (in word count) than non-psychics

Materials

The present study made use of audio recordings produced in a previous study by O'Keeffe and Alison (2000). In O'Keeffe and Alison's study psychics and non-psychics were presented with objects or photographs associated with three recent sexual and/or violent crimes. These participants were provided with minimal detail of each crime and asked to report any impressions about the crime committed and any characteristics of the offender(s). The present study used a selection of the original verbal reports of O'Keeffe and Alison's participants. The verbal reports of four psychics and four non-psychics for the same case (a homicide) were selected from the total number of psychic (n=8) and non-psychic (n=12) reports available. In order to make these reports as comparable as possible psychics' and non-psychics' excerpts were matched for approximate length of reading (on average about 5 minutes duration) and for the reporter's sex (all descriptions were provided by females).

Participants in the present study listened to each verbal report and were asked to rate it for (i) its perceived accuracy and (ii) its persuasiveness. Each of these was rated on a 7-point Likert scale (where 1 = not at all accurate/persuasive and 7 = very accurate/persuasive). An 8-item Belief in the Paranormal questionnaire was also administered (Musch & Ehrenberg, 2002). Each item was scored on a 6-point Likert scale and therefore the questionnaire had a range of possible scores from 8-48.3

Procedure

Two groups of participants attended a seminar room at different times on the same day in the University of Manchester. Members of each group were given a participant information sheet and a consent form. Participants were then given an opportunity to withdraw from the study (none chose to do so). Following this, participants were provided with two envelopes, each marked with a participant number and an envelope number (e.g. Participant 1, envelope 1; Participant 1, envelope 2). Participants were then instructed to open envelope 1 and fill in page 1 of the questionnaire (age and sex). They were then asked to turn the page and read page 2. This page contained a written set of instructions. Once participants had read these instructions the following statement was read out aloud to participants (for the words which appear in parentheses, Group 1 were read only statement 1, and Group 2 were read only statement 2):

> "Over the next hour you will listen to 8 audio recordings [1. of psychics and non-psychics who may or may not have experience in helping the police investigate criminal offences 2. of people who may or may not have experience in helping the police investigate criminal offences,]. Each excerpt will last for a few minutes. In the excerpts you will listen to participants who have been asked to examine photographs from a homicide crime scene. One body was found at the scene. Each participant has been asked to report any impressions they have about the crime, and any characteristics of the offender. After each excerpt you will be asked to indicate on your response sheet how persuasive you think the person's description is, and how accurate you believe the description to be."

Participants were then asked to turn to page 3 of their questionnaire and the first excerpt was played. The order in which the psychic (P) and non-psychic (NP) excerpts were heard was randomized[4]: P, NP, NP, P, NP, P, P, NP. The selection of individuals within this sequence (i.e. psychics 1-4, non-psychics 1-4) was chosen at random.[5] After each excerpt had been listened to participants were given 1 minute to rate

[3] An analysis of this will appear elsewhere,

[4] The order of type of excerpt was randomised by throwing a die (odd numbers - psychic excerpts, even numbers = non-psychic excerpts).

[5] The numbers 1-4 were assigned to individuals in the psychic and non-psychic group based on the order in which they gave their readings in the original O'Keeffe and Alison (2000) study. The selection of each individual within the psychic and non-psycic sequences was then determined by throwing a die. For example, if the first throw for the psychic group produced number 4, then the fourth reading in the psychic group would be the first excerpt participants heard.

the excerpt for accuracy and persuasiveness. After all 8 audio excerpts had been listened to and rated participants were asked to place their completed questionnaire into the first envelope and to seal it. Next, participants were instructed to open envelope 2, which contained the Belief in the Paranormal Questionnaire. Participants then completed this questionnaire, after which they placed it inside the second envelope and sealed it. The sealed envelopes were then collected and participants thanked for their participation.

RESULTS

Hypothesis 1: Psychics would be perceived as more accurate and persuasive than non-psychics

In order to examine differences between ratings given to psychics and non-psychics, Wilcoxon signed ranks texts (one-tailed) were carried out on the data. As predicted, participants gave significantly higher ratings of perceived accuracy (median score 15 compared to 11), z = 4.83, p<.001) and persuasiveness (median score 14 compared to 10, z = 4.79, p<.001) to the readings given by psychics than non-psychics. The data was then examined for each information condition (summarized in Table 1). Regardless of information condition participants gave psychic readings significantly higher Accuracy and Persuasiveness scores than non-psychics.

TABLE 1. SUMMARY OF MEDIAN SCORES (WITH RANGE) AND WILCOXON SIGNED RANK TESTS FOR DIFFERENCES IN PARTICIPANTS' ACCURACY AND PERSUASIVENESS RATINGS GIVEN TO PSYCHICS AND NON-PSYCHICS DESCRIPTIONS BY INFORMATION CONDITION

Measure	Psychic Information Condition (n=24)			No Psychic Information Condition (n=17)		
	Median Score	*Z*	*P*	Median Score	*Z*	*P*
Psychic Accuracy	13.5 (11)	4.00	<.001	16.0 (10)	2.76	.002
Non-Psychic Accuracy	10.0 (11)			12.0 (12)		
Psychic Persuasiveness	13.0 (10)	4.08	<.001	16.0 (14)	2.62	.003
Non-Psychic Persuasiveness	9.0 (11)			11.0 (8)		

Hypothesis 2: Participants who were told that they might be listening to psychics would give lower accuracy and persuasiveness ratings to all excerpts than participants who were not told this

Participants' median scores (with range) for each study measure are shown in Table 2, along with the mean ranks and results of 1-tailed Mann-Whitney U tests for the two informational conditions. A total score for psychics and non-psychics was calculated by summing the scores given to the four excerpts for each. As predicted, participants in the Psychic Information condition, gave significantly lower accuracy scores for both psychics (U=137.5, p= .04) and non-psychics (U=134.5, p=.02), and lower persuasiveness scores for both psychics (U=126.5, p= .02) and non-psychics (U=120.0, p=.01) than participants in the No Psychic Information Condition.

TABLE 2. DIFFERENCES BETWEEN INFORMATION CONDITIONS ON THE STUDY MEASURES

Measure	Psychic Information Condition (n=24)	No Psychic Information Condition (n=17)	*P* Value
	Mean Rank	Mean Rank	
Psychic Accuracy	18.23	24.91	.04
Non-Psychic Accuracy	18.10	25.09	.03
Psychic Persuasiveness	17.77	25.56	.02
Non-Psychic Persuasiveness	17.50	25.94	.01

To summarize the results, it was found that for both accuracy and persuasiveness ratings, higher scores were given: 1) if the speakers were 'psychics' versus 'non-psychics'; and 2) if the speakers were described as 'people' rather than 'psychics and non-psychics'.

CONCLUSION

As predicted, psychics were perceived as more accurate and persuasive than non-psychics, regardless of informational condition. Participants who were told that they might be listening to psychics gave lower accuracy and persuasiveness ratings to all excerpts than participants who were not told this. These findings should not be interpreted as a greater willingness by participants to endorse psychics: indeed, when participants were informed they might be listening to psychics they gave lower accuracy and persuasiveness ratings than participants not given this information.

Previous research (e.g. O'Keeffe & Alison, 2000; Wooffitt, 2001a, 2001b) has demonstrated how psychics may, *in social interaction*, use particular techniques which enable them to appear more accurate and persuasive, especially in convincing a sitter that they have obtained accurate information by paranormal means. The present study excluded the possibility of social interaction: the psychic and non-psychic participants who provided the original descriptions did so several years before participants in the present study were asked to listen to them and rate them for accuracy and persuasiveness. This suggests that the *language used* and/or the *language use* of the psychic is itself more convincing than the non-psychic: for example it may be content related (what is said) or it may relate to the manner in which things are said (e.g. intonation, hesitation, etc.). This is an important issue for parapsychologists who wish to design experimental tests of psychic ability. Just as experimental designs now routinely try to exclude the possibility of cues from 'cold reading' (e.g. the clothes or jewellery a sitter may where, their apparent ethnicity, age and sex, etc.) the results of the present study suggest some consideration of how a reading is conveyed to a listener is also needed.

Despite the significant finding reported here, there is a need to sound a cautionary note. The accuracy and persuasiveness ratings given by participants, whether to psychics or no-psychics, are relatively low. This may be in part explained by the task itself: participants were asked to make accuracy/persuasiveness judgements about events which they themselves had minimal details. Nevertheless, participants did perceive psychics to be more accurate and persuasive than non-psychics. This suggests the need for further work in order to explore what features of the language used by the psychic is responsible for this effect. While the present research indicates that language use is one aspect which contributes to psychics' 'success', it does not preclude its combination with other strategies, such as cold reading, documented in the research literature as features of psychics' performances.

ACKNOWLEDGEMENTS

We would like to thanks two anonymous referees for their comments on an earlier version of this paper.

REFERENCES

Musch, J. & Ehrenberg, K. (2002) Probability Misjudgement, Cognitive Ability, and Belief in the Paranormal. *British Journal of Psychology, 93,* 169-177.

O'Keeffe, C. & Alison, L. (2000) Psychic Rhetoric in Psychic Detection. *Journal of the Society for Psychical Research, 64.1 (585)*, 26-38.

Reiser, M. & Klyver, N. (1982) A comparison of psychics, detectives and students in the investigation of major crimes. In Reiser, M. (Ed.) *Police Psychology: Collected Papers*. Los Angeles: LEHI Publishing Co.

Wooffitt, R. (2001a) A socially organised basis for displays of cognition: procedural orientation to evidential turns in psychic-sitter interaction. *British Journal of Social Psychology, 40(4)*, 545-563.

Wooffitt, R. (2001b) Raising the dead: reported speech in medium-sitter interaction. *Discourse Studies, 3(3)*, 351-374.

A GANZFELD STUDY WITH IDENTICAL TWINS

Adrian Parker
Department of Psychology, Göteborg University, Gothenburg, Sweden

ABSTRACT

The aim here was to maximise psi performance in the ganzfeld in the process of testing the claims for identical twins as a source of psi-gifted individuals. The report here concerns the results of the testing of ten of the planned fifteen pairs of identical twins who were selected on the basis of a form of the Sheep-Goat questionnaire and then their ESP performance evaluated with two sessions of the Real Time Digital Ganzfeld. They obtained a 40% hit rate and a medium effect size.

INTRODUCTION

The study was intended to have a dual function. One of these was to extend the previous work we have carried out at Gothenburg University in looking for reliable methods of obtaining psi-effects using the ganzfeld technique. In looking for a strong psi effect, the use of identical twins seemed to be a promising choice. The second aim was to extend the data base that we have been acquiring for testing with the digital real time ganzfeld (RTDG). Of particular interest is to obtain further data with synchronous real time recordings that might help settle the issue of how to distinguish these from chance correspondences. It is with this aim that the report is concerned.

In searching for a reliable method of obtaining a strong psi effect in the laboratory, it is advantageous to apply the most promising findings from a research methodology, and by taking in account of individual factors. In previous studies we have used the ganzfeld methodology and selected participants primarily on the basis of cognitive and personality factors (Parker, 2000; Wright & Parker, 2003; Goulding, Westerlund, Parker, & Wackermann, 2004). The influence of emotional closeness remains enigmatic. It is one which has a basis in spontaneous case histories (Stevenson, 1970, Schouton, 1982). Moreover, one of our major ganzfeld studies (Goulding, Westerlund, Parker, & Wackermann, 2004) found friends as receivers scored significantly higher. However, the results of the Broughton and Alexander study (1997) with friends as sender-receiver pairs, failed to produce significant scores. The influence of possible psychobiological factors was also a feature of the Broughton and Alexander study, where they found parent/child and sibling combinations as receivers and senders produced high rates; at 43.5% and 71.4% respectively. Although the study encompassed nearly 200 sessions, the number of sessions in this study with biologically related individuals were very small.

Because of the possible relevance of biological factors as well as emotional closeness to that of telepathic experiences, twins have been of interests since the beginnings of psychical research and parapsychology. Indeed, although he did not commit himself to use the words such as transference or telepathy, Francis Galton (1907) reported that eleven of the 35 twins in his collection showed “similarity in the association of ideas” in the form of illustrated remarkable synchronous thoughts and events. Naturally, the normal explanation is the form of thought concordance and this explanation persists today and is used by twin researchers, if in a somewhat glob manner, to discount any possible genuine cases of telepathy amongst twins (Siegal, 1999).

The first controlled studies to use twins in experimental parapsychology were reported by Kubis and Rouke (1937) but of the six twins tested only one pair was identical, and the results were not significant. At the Duke University Parapsychology Laboratory, Stuart tested two pairs of twins, one of which gave significantly positive results and the other significantly negative results (Stuart, 1946). Surprisingly, there have been only a few studies of ESP with twins since then. There have however been have been successful studies with identical twins which reported synchronously shared physiological effects in the form of changes in blood flow (Esser et al. 1967), EEG arousal (Duane and Behrendt, 1965) and GSR (Bohm, 1984 quoted in Playfair, 1999). These physiological effects, although difficult to explain in normal psychological terms, can be seen as the experimental analogue of the many anecdotal reports of shared pain which are often reported by twins (Playfair, 1999, 2002).

The conventional explanation for the claims of telepathy between twins in terms of thought concordance was given support by an experiment carried by Blackmore and Chamberlain (1993). They tested three pairs of identical twins. The possibility of thought concordance was allowed by allowing in one condition, the sender to choose a picture, a number, and to also draw freely while the receiver was to draw what came to mind or else to identify the picture the other twin had selected. In the other condition, ESP condition, the targets were of course chosen randomly. The results showed clear evidence for thought concordance but none for ESP. It is however remarkable considering only three pairs of unselected twins were tested that this study has been cited as conclusive in rejecting the ESP hypothesis in favour of the concordance hypothesis (Siegal, 1999). On the contrary, it is immediately apparent from a review of the literature that the previous studies are too few in number, have used use only a handful of participants, have not selected for identical twins (which most of the anecdotal literature concerns, and have not made any assessment of belief in terms of sheep or goats. It was in an effort to correct these shortcomings that the following study was carried out.

Hypotheses:

Direct first hits will be used as the primary basis of analysing the results since this is in agreement with its conventional use in ganzfeld studies.

The hypothesis proposed here is that the ganzfeld testing of identical pairs of twins selected for belief in psi, will obtain a scoring rate well in excess of what previously has been claimed for the Ganzfeld studies following the normal specifications. This scoring rate is usually estimated for first rank hits to be a percentage in the mid 30s (with mean chance expectation lying at 25%), and with an effect size of approximately 2.6.

METHOD

Design

The study was set up to fulfil the above entry criteria for selection of participants. Thus the aim was to find fifteen pairs of identical twins (or those believed themselves to be identical twins), who were believers in psi and who had what was for them convincing experiences of what was ESP. They would then take part in the Real Time Digital Ganzfeld experiment set up as a double session. The RTDG is an advancement of other forms of the autoganzfeld in that it records digitally the mentation report in real time with the target film and also superimposes the mentation report on the decoy films. This allows the real time correspondences to be used as cues in the judgement and also to recorded as qualitative hits. The RTDG has been fully described fully elsewhere (Parker, 2004, Goulding, Westerlund, Parker, & Wackermann 2004) and the basic set up is shown in Figure 1. The computer randomly generates first a set and then from the set of four film clips, an individual target which the sender views 7 times during 14 minutes and then automatically selects a second set and its target film which is viewed for the final 14 minutes of the 30 minute session. During this period of thirty minutes while the sender is viewing the target film clips, the receiver is in a period of ganzfeld stimulation during which the requirement is to whenever possible give a mentation report of the ongoing internal imagery. This report is recorded by being fed into the sound card of the computer in real time with the target film clips. Afterwards the receiver has the task of using his recalled imagery aided by the replayed mentation report, to select and rank the four films in the set in the order of their proximity to the film clip target. In order to make these judgements the each film can be played by along with the superimposed mentation report.

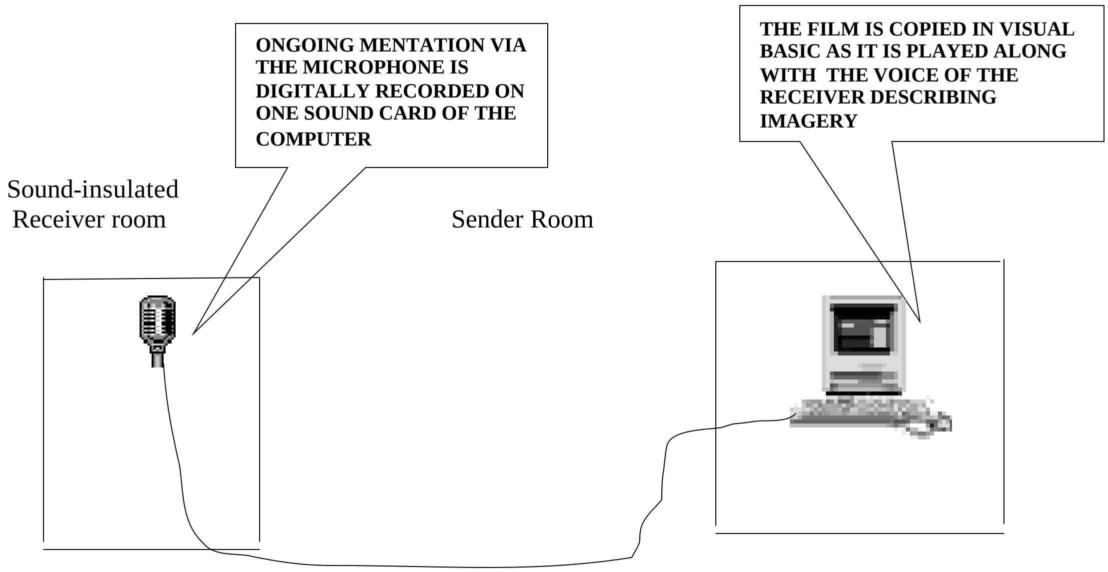

Figure 1 The Digital Ganzfeld set up

Procedure

Participants were recruited through an advertisements and newspaper articles about the project. Additional potential volunteers were recruited through students and their personal contacts. In this we asked for identical twins who would like to take part in a study on experiences of the type when one twin was able to feel or know what the other was experiencing. In order to avoid controversy, we deliberatively did not use of the word "telepathy". Because of this, an important part of the initial contact was aimed at determining the nature and range of experiences which the potential twin participants reported. About 60 twins responded to the study and about half were eliminated through the telephone interview.

A telephone interview and then an interview questionnaire were used in order to select participants to up fill the entry criteria. A further interview questionnaire was used to select subjects for the study according to the above entry criteria. The questionnaire included three questions from the Australian Sheep-Goat Scale and several others aimed at documenting the occurrence of similar dreams, the commonality of pain and other sensations, and remarkable correspondences relating to decision making. A five point Likert scale was used for the sheep-goat questions. The remaining participants who wanted to take part but did not fulfil the entry criteria were used for the control group whose results will be reported later. However testing was carried out, it was decided and written on the form which group – experimental or control- the participating twins belonged to.

Testing was carried out in the custom build laboratory rooms in the psychology department. The experimenter for the sessions was assisted by a student experimenter on a few occasions, but otherwise the sessions were run with one experimenter. The DRTGF was purposely designed so that it can be used a single experimenter by having the computer in the sender room supply the sender with user friendly instructions to guide the sender through the procedure.

The receiver was exposed to 8 minutes of relaxation tape followed by 30 minutes of ganzfeld stimulation using sound from sea waves as auditory stimulation. After the completion of this, using the second computer, in the receiver room, assess could be made to film data bank and then to the set containing the target film and three decoys. The set could be then replayed along with the mentation report superimposed and the task of thee receiver was then to rank these films in order of proximity to the corresponding ganzfeld imagery. A graphical representation of the mentation report enabled the since sequences to be skipped. Each session gave two trials (where p =.25).

RESULTS

To date, we report the findings form the first ten pairs of the fifteen identical twins to be tested and who took part in the study giving twenty trials in two four choice situations. Eight of the ten were pairs were women, the range of age was from 15 until 63 years with a median of 23 years and a mean of 27. A total of eight direct this were obtained in the twenty dual ganzfeld sessions giving a hit rate of 40% and effect size of .35. The scores did not reach statistical significance on a binomial test: p = 0 .10, two-tailed.

CONCLUSIONS

The data base here is obviously too small to draw any certain conclusions but results are nevertheless encouraging in so far as they support the hypothesis that identical twins are with prior experiences of and openness to what appears to be telepathic experiences, do appear suitable source for recruitment for ganzfeld testing. There are however some further reservations. It should be noted that the initial selection group was large compared to the group we actually tested. Contrary to what was expected the experience from telephone interviews and direct interviews (of about 6o twins) psi dramatic experiences of the sort reported in the literature on identical twins, do not appear to be from common - at least in this recruitment group in Sweden. Moreover even amongst the selected group the form of dramatic experiences in which they reported spontaneously becomes aware of the other twin's crisis situation, does seem to be extremely rare and was reported by only two of the participating pairs of twins. Likewise shared pain, shared dreams, coincidental happenings were also rarely reported. Most common was the experiences of choosing similar clothes or making similar choices, which of course is consistent with the concept of thought concordance. On the other hand the idea of having a special (non-sensory) "connectiveness" was endorsed by nearly all of the selected participants. Further details of these types of events and their frequencies will be reported later.

Interestingly, in seeking examples of awareness of the other twin's crisis and pain experiences, nearly all the participants commented that they had never had the misfortune of having any serious accident or life threatening crisis. It may well be case that the relatively secure way of life in Swedish society eliminates the need for such experiences. Even the rarity of telepathic experiences may be explained by modern society: Many twins reported that they were constantly in touch with each other during the day – but by mobile telephone. It should be noted that Swedish family policy is to actively encourage twins to develop separate identities and personalities.

It remains then still a matter of conjecture as to how to explain the high frequently and high profile of the claims for telepathy between identical twins. Even supposing a further confirmation of the present findings supporting the increased occurrence of ESP amongst twins, the results are now clearly superior to that of a group which has been selected for belief in psi. It is particularly doubtful as to the role that genetic and biological factors might play. It should be noted that all the twins we tested here grew up together and had close, positive and non-enveloping relationships and this could, in itself, be the major psi-conducive factor.

REFERENCES

Barron, F. & Mordkoff, A. M. (1968). An attempt to relate creativity to possible extrasensory empathy as monitored by physiological arousal in identical twins. *Journal of the American Society for Psychical Research, 62* (1), 73-79.

Blackmore, S. J. & Chamberlain, F. (1993). ESP and thought concordance in twins: a method of comparison. *Journal of the Society for Psychical Research, 59* (831), 89-96

Broughton, R. S. & Alexander, C. H. (1997). Autoganzfeld II: An attempted replication of the PRL ganzfeld research. *Journal of Parapsychology, 61*,209-226.

Duane, T. D. & Behrendt, T. (1965) Extrasensory electroencephalographic induction between identical twins. *Science*, 15 October, 367.

Esser, A. H., Etter, T. L. & Chamberlain, W.B. (1967) Preliminary report: physiological concomitants of ´communication´ between isolated subjects. *International Journal of Parapsychology, 9*, 53-56.

France, G. A. & Hogan. R. A. (1973). Thought concordance in twins and siblings and associated personality variables. *Psychological Reports, 32*, 707-710.

Galton, F. (1907) Inquiries into Human Faculty. Dent & Sons: London

Goulding, A., Westerlund, J., Parker, A., & Wackermann, J. (2004). The first digital autoganzfeld study using a real-time judging procedure. *European Journal of Parapsychology, 19*, 66-97. 7

Kubis, J. F. & Rouke, F. L. (1937). An experimental investigation of telepathic phenomena in twins. *Journal of Parapsychology, 1* (3), 163-71.

Nash, C. B. & Buzby, D. E. (1965). Extrasensory perception of identical and fraternal twins: comparison of clairvoyance test scores. *Journal of Heredity, 56* (2), 52-64.

Palmer, J. (2003). ESP in the ganzfeld: analysis of a debate. *Journal of Consciousness Studies, 10* (6-7), 51-68.

Parker, A., Grams, D., & Pettersson, C. (1998). Some further variables to psi in the Ganzfeld. *Journal of Parapsychology, 62*, 27-45.

Parker, A. (2000). A review of the ganzfeld work at gothenburg university. *Journal of the Society for Psychical Research, 64*, 1-15.

Playfair, G. (1999) Telepathy and identical twins. *Journal of the Society for Psychical Research*, 63, 86-98.

Playfair, G. L. (2002). *Twin telepathy - the psychic connection*. London: Vega.

Segal, N. L. (2000). *Twins and what they tell is about human behaviour.* New York: Plume.

Schouten, S. A. (1982). Analysing spontaneous cases: A replication based on thee Rhine collection. *European Journal of Parapsychology, 4*, 113-158.

Stevenson, I. (1970). *Telepathic Impressions: A Review and Report of 35 New Cases*. Charlottesville: The University of Virginia Press.

Stuart, (1946) GESP experiments with the free response method. *Journal of Parapsychology, 10*, 21-35.

Westerlund, J., Parker, A., Dalkvist, J., & Goulding, A. (2004). Remarkable correspondences between Ganzfeld mentation and target content - psi or a cognitive illusion? In *The Parapsychological Association 47th Annual Convention: Proceedings of presented papers*

Wright, D and Parker, A. (2003) An Attempt to Improve ESP Scores Using the Real Time Digital Ganzfeld Technique. *European Journal of Parapsychology, 18*, 65-72

AN INITIAL EXPLORATION OF AMBIENT TEMPERATURE FLUCTUATIONS AND ANOMALOUS EXPERIENCES

Steven T. Parsons[1] & Ciarán O'Keeffe[1]
[1]*Department of Psychology, Liverpool Hope University*
Liverpool, United Kingdom

INTRODUCTION

A frequent characteristic of apparitions is that the percipients experience a feeling of cold (Tyrrell, 1953). In addition, sitters at séances, have since the earliest days of spiritualism, reported apparent falls in temperature (Randall, 2001).

Parapsychologists have reported a correlation between unusual temperature experiences and allegedly haunted locations, often without verifying the hypothesised causes of such temperature changes (Wiseman, Watt, Stevens, Greening & O'Keeffe, 2003). Inevitably, perhaps, the majority of such reports from experients and researchers are purely subjective but reports from fieldwork investigations conducted using calibrated monitoring equipment suggest that a number are objective and represent highly unusual sudden changes in the ambient temperature (Turner, 1970) (Para.Science, 2005). Despite evidence from fieldwork, no laboratory studies have attempted to demonstrate the same correlation.

Radin and Rebman (1996) constructed an instrumented Psychomanteum[1] chamber to examine the relationship between a participant's mental state and changes in the local physical environment. Temperature was measured using a computerised thermometer with millidegree sensitivity. The temperature sensor was positioned close to floor level behind the participants chair with an output feed to a computer in an adjoining room.

The majority of significant correlations between the environmental and physiological variables, were due to temperature changes within the chamber. The temperature initially rose then began to drop. Radin and Rebman (1996) suggested the initial presence of an experimenter , participant and facilitator, prior to the session's commencement, would raise the temperature, the departure of the experimenter and facilitator then causing the temperature to fall. The continued fall in the temperature throughout the session probably related to the participants general calming. Due to this suggestion that some of the significant ambient temperature and physiological correlations were possibly artefacts of a common downward drift in temperature, Radin and Rebman (1996) excluded all ambient temperature cross-correlations from their subsequent data.

The un-tested explanation given is one of a number of possibilities. For example, the lowering may simply be due to the floor level placement of the temperature sensor where it may be expected that cooler air collects after being displaced by warmer rising air that has been heated by the participant. Additionally, the data could represent a real correlation between the participant's mental state and a change within the physical environment. A hypothesis that is un-tested given the lack of data.

This pilot study, therefore, was inspired by Radin and Rebman's (1996) study (hereafter referred to as the 'Nevada study') but with the primary aim to measure any alterations in the ambient temperature coincident with the participant reporting an experience of an apparition appearing.

[1] Derived from mirror gazing or 'scrying' the psychomanteum is basically a dimmed, quiet room in which the participant is comfortably seated, asked to relax and look into a mirror facing them (Moody, 1994).

METHODS

Design

This is an exploratory correlational study. For this pilot study, a minimum of twelve volunteer participants are required. By selecting the volunteers from as broad a representative of ages and demographic backgrounds as possible, it is hoped to obtain a representative sample of the general population. Each is expected to participate for a single session lasting a total of 1 ½ to 2 hours. This time will include some time with a 'facilitator' who will discuss with each participant the Psychomanteum experience and procedures. After the Psychomanteum session the participant will be interviewed briefly about their experiences.

Materials – Psychomanteum

The selected room already has some prior modifications undertaken to facilitate its use in an unrelated Ganzfeld study. Various materials are to be used to ensure the required specifications for a Psychomanteum generally, and to ensure adequate replication of the Nevada Psychomanteum (e.g. mirror, lightweight plywood sheets for light blocking, dark material for walls and ceiling, large comfortable chair).

The mirror selected is a standard silvered back, glass mirror 3ft wide by 18" high suspended from a height variable hook mounted directly onto the wall of the chamber, allowing a small range of height adjustment to be made of around 6" vertically.

Materials – Temperature measurement

Twelve Lascar Electronics EL-USB-2 temperature data-loggers are to be positioned in 4 horizontally spaced arrays positioned at the intersection of virtual lines describing 1/3rd and 2/3rd of the chambers length and width, thus two arrays will be in front of the participant with the second pair behind them. Such spacing allows an equidistant spacing to be achieved between the arrays and serves to keep them well outside the normal visual field of the participants to remove visual distraction. Each array consists of three vertically spaced data-loggers. The 1st, 6" above the floor, a 2nd at the midpoint between floor and ceiling and the 3rd 6" below the ceiling. This is simply achieved by suspending 3 data-loggers at the desired heights on one of four support cords attached to hooks in the ceiling.

Each of the temperature data-loggers is a small stand-alone and time-indexed device that measures and stores the ambient temperature, sample number and time of sampling to an internal memory. The stored data can later be retrieved by connecting to and downloading to a computer. Samples will be taken at 1 second intervals throughout all the sessions. Each data-logger in turn, has an internal clock synchronised with that of the host computer automatically by the operating software as part of the initialisation procedure.

A further two computer-based Pico Dr.Daq thermometers with millidegree accuracy are to be used, one located on the rear 'shoulder' of the participants chair to allow the temperature to be measured close to their head whilst remaining out of their direct sight. The final thermometer will be placed in the same position as the temperature sensor in Nevada study This sensor will permit direct comparisons to be made between the ambient temperature data from that study. The outputs from both the computer-based thermometers are to be taken via cables to a computer located in an adjoining room for display and recording at a sample rate of 1 sample per second for both thermometers.

To ensure that the data is accurately time-indexed from all of the temperature gathering devices, the same computer – used to initialise the internal clocks in the data-loggers will also be used to record the output from the computer-based thermometers.

To facilitate communications throughout the Psychomanteum session a two-way intercom will be used. This will permit either party to instigate communications at any time – the unit inside the Psychomanteum chamber is voice activated and will allow the participant to communicate with the experimenter at any time, merely by speaking at a normal volume.

Procedures

Upon arrival, each participant will be met by the facilitator who will spend around 30 minutes discussing their feelings and memories of a deceased loved one (Moody & Perry, 1994, pp. 85-86). Also, the purpose of the psychomanteum and the experimental procedures will be explained and participants will be informed that the sensors will be measuring general changes within the chamber's environment during the session. Specific reference to the measurement of temperature will only be made in the debrief.

The participant will be made aware of the services of a trained counsellor should they require it after the session has ended. In addition, standard briefing protocols will be followed ensuring and informing about anonymity, confidentiality and freedom to withdraw.

After this preparatory session the participant will be taken into the psychomanteum chamber and seated comfortably in the chair. The position of both the chair and mirror can be altered by the experimenter to ensure the participant is able to see only the reflected rear wall of the chamber in the mirror. Adjustments to the illumination levels can also be made to suit individual participants.

Once both parties are satisfied all is well the experimenter will withdraw from the chamber, returning to the experimenter station.

In the Nevada study the individual sessions lasted at least 45 minutes, with some lasting in excess of one hour. Due to time constraints it was decided to set a limit of 45 minutes for each individual session in this pilot study.

RESULTS

The data from the various temperature sensors will be examined to determine the ambient temperature changes throughout the sessions. It is expected that the ambient temperature will show an uneven distribution of changes in both directions across the chamber throughout each session. At the higher level, it is anticipated that the data-loggers will indicate an overall rise in temperature due to the rising of the warmer air inside the chamber. The data-loggers close to the floor are expected to show a decrease in temperature overall as the displaced cooler air sinks to the base of the chamber.

Using statistical comparisons, values for the chamber average and mean ambient temperature changes can be obtained. In addition, the temperature data will also be analysed, using correlational tests, in order to examine the relationship between the participants subjective accounts of their experiences and temperature fluctuations.

DISCUSSION

This pilot study forms part of a PhD study looking at physical, physiological and psychological relationships of temperature changes and the reporting of anomalous experiences. It represents an initial exploration of the link between temperature fluctuations and anomalous experiences. Further laboratory-based studies are envisaged, in addition to a number of already designed, field studies that 'bring the laboratory into the field'.

References

Moody, R.A. (1994). A Latter-Day Psychomanteum. *Proceedings of the 37th Parapsychological Association Convention, University of Amsterdam, Holland*.

Moody, R.A. & Perry, P. (1994). *Reunions: Visionary encounters with departed loved ones.* New York: Random House.

Para.Science. (2005). Investigation report of spontaneous haunt phenomena at the former Cammell Lairds Shipyard, Birkenhead. *Retrieved from* www.parascience.org *on June, 26, 2006.*

Radin, D. I., & Rebman, J. M. (1996). Are phantasms fact or fantasy? A preliminary investigation of apparitions evoked in the laboratory. *Journal of the Society for Psychical Research, 61*, 65-87.

Randall J.L. (2001). The Mediumship of Stella Cranshaw: A statistical Investigation. *Journal of the Society for Psychical Research 65.1(*862), 38-46.

Turner K.H. (1970). A South Yorkshire haunt. *Journal of the Society for Psychical Research, 45, (*745), 325-353.

Tyrrell G.N.M. (1953). *Apparitions*. London: Duckworth and Co Ltd.

Wiseman R., Watt C., Stevens P., Greening E. & O'Keeffe C. (2003). An investigation into alleged hauntings. *British Journal of Psychology, 94*, 195-211.

ANDROGYNY, FEMININITY AND MASCULINITY IN WOMEN: EXPLORING HOW GENDER ROLE AND BOUNDARY THINNESS RELATE TO PARANORMAL EXPERIENCES, BELIEFS AND ESP[1]

Christine A. Simmonds-Moore, PhD & Stephen L. Moore

Psychology Department
Liverpool Hope University,
Liverpool,
UK.

INTRODUCTION

Overview

This research brief describes an ongoing study focusing on the relationship between gender role (in particular psychological femininity and androgyny) and extrasensory perception. The relationship between gender and paranormal phenomena is not a new topic in parapsychology. However, gender role (when considered as a separate variable to biological gender) has been relatively neglected over the years. This is the case despite several authors noting that the social aspects of gender might be important in the development of attitudes toward the paranormal (e.g., Blackmore, 1991; Greyson, 1977). Some work (e.g., Spinelli & Reid, 2001-2002) has considered the connection between gender role and paranormal phenomena more explicitly, although much work has focused on the relationship with subjective paranormal experiences and paranormal beliefs, rather than ESP. This research project seeks to investigate how psychological gender role may relate to both subjective paranormal experiences and performance on a task designed to measure extrasensory perception. It will also address how gender role interacts with personality (Hartmann's Boundary Questionnaire, BQ, e.g., 1991) in its effect on ESP.

Gender and paranormal experiences

In the mind of the lay person and the media, paranormal experiences are often associated more with women (e.g., Blackmore, 1991). It is a common stereotype that psychics or mediums are female. This is despite the fact that at the height of spiritualism, and currently, male and females are working as mediums. Schouten's (1986) statistical analysis of L.E. Rhine (1961) and Sannwald's (1963) spontaneous case reports featured more women than men, but did not indicate that women were more sensitive to ESP, or more likely to admit to having had a paranormal experience. Roll's original work with poltergeists found an over-representation of women than men as agents, although a later analysis found no gender difference (Roll, 2006, personal communication). This may reflect a female reporting bias in the earlier cases. Women are, however, more likely to visit a psychic than men (Roe, 1997) and are more likely to report a "sense of presence" under laboratory conditions (Tiller and Persinger, 1994). In representative surveys of paranormal experiences, women often report more experiences than men (c.f. Blackmore, 1991), although this difference is not always significant (Palmer, 1979). It may be that paranormal experiences are more associated with having a more feminine psychology, rather than being female.

[1] The authors would like to acknowledge the Perrott-Warrick fund, Trinity College, Cambridge, who kindly funded this research. We would also like to thank the PA reviewers for their valuable comments on this study.

Gender and ESP performance

Little work has focused directly on gender differences in ESP performance. Often, this variable is included as an after-thought, or left unanalysed. Overall, there does not seem to be a significant difference in ESP performance between the genders (e.g., Green, 1963, Wiseman and Greening, 2002). However, males significantly outperformed females in two ESP experiments where receivers were in an altered state of consciousness (Krippner, 1975; Simmonds, 2003). Dalton and Utts (1995) found a relationship between different sex combinations (sender-receiver-experimenter) and psi, where mixed sex pairs were the best combination for psi performance.

Gender and paranormal belief

Paranormal beliefs are consistently found to be stronger among women compared to men (c.f. Blackmore, 1991). Irwin (1993), for example, found that women attained higher scores than men on most paranormal belief items, e.g., ESP (telepathy in particular), superstitiousness, astrology, hauntings, psychic healing, reincarnation and traditional religious beliefs. Females are also more likely to be afraid of the paranormal (Houran & Williams, 1998; Lange and Houran, 1998; 1999). However, it is of interest to note that men were more likely than women to endorse beliefs in more “masculine” phenomena such as the existence of aliens (Irwin, 1993). This indicates a social aspect to the development of paranormal beliefs, in terms of what is acceptable or unacceptable to each gender in any given culture.

Gender role and the paranormal

Gender role is considered to derive from a complex interaction between biological influences and conditioning from the cultural environment (e.g., Casey, Braebeck and Nuttall, 1995). Work on gender role (e.g., Bem, 1974) classifies individuals, irrespective of their biological gender, into four groups depending on how they respond to a series of adjectives which relate to the culturally accepted idea of what is feminine and masculine. The groups are Feminine for those who score high on femininity and low on masculinity; Masculine for those who score high on masculinity and low on femininity; Undifferentiated for those who score low on masculinity and femininity and Androgynous for those who score high on masculinity and femininity.

L.E. Rhine (1961) suggested that it is not sex but rather *attitude* that may relate to ESP which derives from cultural differences in upbringing between males and females. This supports a socio-cultural understanding of what is “masculine” or “male” and what is “feminine” or “female”. Blackmore (1991) suggests that paranormal thinking becomes feminised as it falls outside of the dominant scientific (masculine) thinking. Similarly, Greyson (1977) suggested that those who believed in paranormal phenomena in his sample (psychiatric patients) did so because they had been socialized into the feminine gender role and had relaxed their body boundaries to accept the idea of extrasensory intrusion.

There is very little in the literature in terms of how gender roles relate to paranormal experiences and beliefs. However, the feminine gender role (irrespective of biological gender) relates to irrational beliefs (Coleman & Ganong, 1987) as well as to paranormal belief and experience (Spinelli & Reid, 2001-2002). Femininity was also found to relate to fear of the anomalous and paranormal (Lange and Houran 1999; Simmonds 2003).

We propose that androgynous individuals, exhibiting high levels of both psychological femininity and masculinity may be of interest for parapsychology. To date, little work has directly focused on the relationship between psychological androgyny and paranormal experiences. Work has, however investigated the idea of rational versus intuitive thinking and how this might relate to paranormal beliefs (e.g., Irwin and Young, 2001). In support of a relationship between intuitive thinking, being female and paranormal beliefs, Aarnio and Lindeman (2005) found that higher intuition and lower analytical thinking in women contributed to higher belief in women than in men.

Wolfradt, Oubaid, Straube, Bischoff & Mischo, (1999) found that those who possessed *both* intuitive and rational thinking styles were more likely to report paranormal beliefs, paranormal experiences and subjective paranormal ability, than those who expressed intuitive or rational thinking in isolation. A combination of rational and intuitive thinking may be equivalent to someone scoring high on scales measuring both what is considered masculine and feminine according to the Western world view. However, Irwin and Young (2001) did not find the combination pattern in their study, and note that Wolfradt et al failed to find it in a replication of their 1999 study. In fact, Irwin and Young found that paranormal beliefs were more related to an intuitive (and not rational) thinking style. However, there was, a trend toward a relationship between a combination of rational and intuitive thinking and new age beliefs. These later studies did not address paranormal experiences, which should be investigated with regard to the combination pattern.

Gender role has also been considered in the spirituality literature. Femininity was found to relate significantly to spirituality, however, psychological androgyny demonstrated a stronger relationship with spirituality than femininity in isolation (Herman, 1996). Sell has explored the experiences of 'third-gendered' individuals in USA; those who fall into the middle ground in terms of their subjective gender identity, e.g., one might identify as both man and woman or not man or woman (Sell, 2001). She found that 93% reported transcendent spiritual experiences or paranormal abilities, and many were working as healers. Sell (2001) suggests that this is due to their stepping out of conformity, which may allow for more unusual experiences. Overall, it is considered here that those who are psychologically androgynous might also do well at an ESP task.

Interaction effects

Blackmore (1991) has suggested that other factors that correlate with gender might affect belief to a greater extent than gender itself. Gender interacts with the personality construct boundary thinness (Hartmann, 1991), which itself relates to paranormal experiences (e.g., Richards, 1996). *Thin* boundaries in the mind refer to the relative connectedness of psychological processes in the mind and brain, which is reflected in a thinking style of 'shades of grey'. *Thick* boundaries in the mind, refers to a relative separateness of psychological processes, which is reflected in a thinking style of 'black and white' (Hartmann, Rosen & Rand, 1998).

Females are more likely to have thinner boundaries than males, while males are more likely to have thicker boundaries than females (Hartmann, 1991). Gender role and boundary thinness were previously found to interact with paranormal belief (e.g., Spinelli & Reid, 2001-2002). Gender and boundary thinness may also interact in terms of ESP performance. Unpublished research demonstrated an interaction between gender role, boundary thinness and ESP performance, such that there was a stronger correlation for women than men between boundary thinness and performance on a Zener card ESP test[2].

The current work seeks to replicate and extend previous work in the area of gender role and ESP. It seeks to address the relationship between gender role categorization (according to the Bem Sex role inventory) and subjective paranormal experiences, paranormal beliefs and performance at an ESP task. This work also seeks to understand how gender role interacts with Hartmann's BQ in an effect on paranormal experiences, beliefs and ESP.

Planned Hypotheses:

1. There is a gender role difference in paranormal beliefs
2. There is a difference in boundary thinness with regard to paranormal beliefs
3. There is an interaction between gender role and boundary thinness with regard to paranormal beliefs
4. There is a gender role difference on anomalous experiences
5. There is a difference in boundary thinness with regard to anomalous experiences

[2] This work was a coursework assignment for a student on the parapsychology module at Liverpool Hope University.

6. There is an interaction between gender role and boundary thinness with regard to anomalous experiences
7. There is a gender role difference in ESP scoring
8. There is a difference in boundary thinness with regard to ESP scoring
9. There is an interaction between gender role and boundary thinness with regard to ESP scoring[3]

METHODS

Design

The study has a factorial 4x2 design and will classify people according to their gender role category (feminine, masculine, androgynous or undifferentiated) and in terms of their boundary thinness (thick or thin). There were three dependent variables in this study; scoring on paranormal belief (as measured by the Australian sheep-goat scale), scoring on anomalous experiences (as measured by the Anomalous Experience Inventory, experiences subscale) and scoring on an ESP task (as measured by a Zener style test). There will also be a comparison to mean chance expectation performance, both overall and within each subgroup.

Participants

150 female participants will be recruited to take part in this study (to date, 60 have been tested). The restriction to women allowed for an assessment of gender role while keeping biological gender constant. Participants were recruited from Liverpool Hope University, from the local Liverpool area and from among friends and colleagues of the experimenters. An incentive in the form of £20 for the top 20 scorers on the ESP task was offered to prospective participants.

Materials

An information sheet and consent form was attached to a questionnaire battery which includes The Australian Sheep-goat scale, the Anomalous Experience Inventory and the Bem Sex role inventory[4].

A Zener style ESP test using five coloured fruits was employed. To avoid the stacking effect, a randomized order for 5 symbols was generated for each participant. The randomized order was then converted into five fruit types which was printed (in colour) on two pages (25 per page). The two fruit sheets were surrounded by black paper and sealed inside a thick opaque envelope. A scoring sheet containing 50 response spaces was taped onto the front and back of each envelope. A selection of 5 fresh fruits was employed for each experimental sitting (apple, banana, grapes, orange and pineapple).

Procedure

Participants were informed the experiment would take approximately 45 minutes to complete. All were tested in small groups, at the same time. Each person was given a consent form and battery of questionnaires. Next, participants were asked to taste, smell and generally interact with the five types of fruit that was presented in the experimental room. They were told that this might help the ESP process which would follow. Participants were each given an envelope containing a randomized order of the 50 x 5 fruits. Generally, a fun atmosphere was encouraged and all participants were told that they would receive feedback on their performance in the next few days (usually via email). They were also told that they could receive feedback on their personality scores at the end of the study. Participants were offered a cash incentive to participate, such that top 20 scorers would receive £20. This design consideration was

[3] We plan to correct for multiple analysis, e.g., using a Bonferroni correction

[4] The Schutte Emotional Intelligence scale was also included for exploratory purposes.

included firstly to motivate people to participate in the study and secondly to increase the level of meaning in a forced choice experiment.

Planned Analysis

An assessment of deviation from mean chance expectation will be calculated with regard to ESP performance for the entire group and for each subgroup. A MANOVA will be undertaken for the simultaneous assessment of the different IVs and DVS and how they interact with one another. The research brief will describe the results of an analysis on the data collected thus far.

References

Aarnio, K. & Lindeman, M. (2005). Paranormal beliefs, education, and thinking styles. *Personality and Individual Differences, 39*, 1227-1236.

Blackmore, S. J. (1991). Are women more sheepish? Gender differences in belief in the paranormal. In L. Coly & R. A. White (Eds.), *Proceedings of Presented Papers from an International Conference on Women and Parapsychology*, (pp. 68-89). New York: Parapsychology Foundation, inc.

Casey, M. B., Braebeck, M. M., & Nuttall, R. L. (1995). Note. As the twig is bent: The biology and socialization of gender roles in women. *Brain and Cognition*, 27, 237-246.

Coleman, M & Ganong, L. H (1987). Sex, sex roles and irrational beliefs. *Psychological Reports*, 61, 631-638.

Dalton, K., & Utts, J. (1995). Sex pairings, target type and geomagnetism in the PRL automated ganzfeld series. In Proceedings of Presented Papers from the 38th Parapsychological Association Annual Convention, 99-112.

Greyson, B. (1977). Telepathy in mental illness: Deluge or delusion? *Journal of Nervous and Mental Disease, 165* (3), 184-200.

Hartmann, E. (1991). *Boundaries in the mind: A new psychology of personality*. New York: BasicBooks.

Hartmann, E., Rosen, R., & Rand, W. (1998). Personality and dreaming: Boundary structure and dream content. *Dreaming, 8* (1), 31-39.

Herman, D. M. (1996). An investigation of the relationship between androgyny and spirituality. *Dissertation Abstracts International: Section B: The Sciences and Engineering, 57*, pp 4074. Abstract retrieved from Psychiinfo.

Houran, J., & Lange, R. (1997). Tolerance of ambiguity and fear of the paranormal in self-identified percipients of haunting/RSPK phenomena. *Journal of the Society for Psychical Research, 62* (848), 36-40.

Irwin H. J. (1993). Belief in the paranormal: A review of the empirical literature. *Journal of the American Society for Psychical Research, 87* (1), 1-39.

Irwin, H. J & Young, J. M. (2001). Intuitive versus reflective processes in the formation of paranormal beliefs. *European Journal of Parapsychology, 17*, 45-53.

Lange, R., & Houran, J. (1998). Delusions of the paranormal: A haunting question of perception. *Journal of Nervous and Mental Disease, 186* (10), 637-645.

Lange, R., & Houran, J. (1999). The role of fear in delusions of the paranormal. *Journal of Nervous and Mental Disease, 187* (3), 159- 167.

Palmer, J. (1979). A community mail survey of psychic experiences. *Journal of the American Society for Psychical Research, 73,* 221-251.

Parker, A. (2000). A review of the ganzfeld work at Gothenburg University. *Journal of the Society for Psychical Research, 64.1* (858), 1-15.

Richards, D. G. (1996). Boundaries in the mind and subjective interpersonal psi. *Journal of Parapsychology, 60,* 227-240.

Rhine, L. E. (1961). *Hidden channels of the mind*. New York: William Morrow and Company.

Roe, C. A. (1997). Belief in the paranormal and attendance at psychic readings. In *Proceedings of Papers Presented at the Parapsychological Association 40th Annual Convention*, pp. 335-357.

Sannwald, G. (1963). On the psychology of spontaneous paranormal phenomena. *International Journal of Parapsychology, 5,* 274-292.

Schouten, S. A. (1986). A different approach for analyzing spontaneous cases with particular reference to the study of Louisa E. Rhine's case collection. In K. R. Rao (Ed.), *Case Studies in Parapsychology in Honor of Dr. Louisa E. Rhine*, (pp. 31-45). Jefferson NC: McFarland and Company Inc.

Sell, I. (2001). Not Man, Not Woman: Psychospiritual Characteristics of a Western Third Gender. *Journal of Transpersonal Psychology 33* (1), 16-36.

Sell, I. (2001). *Third Gender: A Qualitative Study of the Experience of Individuals Who Identify as Being Neither Man Nor Woman.* Paper presented at the 19th annual convention of the American Psychological Association, August 24, 2001.

Simmonds, C. A. (2003). *Investigating schizotypy as an anomaly-prone personality*. Unpublished PhD thesis. University College Northampton/University of Leicester, UK.

Spinelli, S. N., & Reid, H. M. (2001-2002). Belief in and experience with the paranormal: Relations between personality boundaries, executive functioning, gender role and academic variables. *Imagination, Cognition and Personality*, 21, 333-346.

Tiller, S. G., & Persinger, M. A. (1994). Elevated incidence of a sensed presence and sexual arousal during partial sensory deprivation and sensitivity to hypnosis: Implications for hemisphericity and gender differences. *Perceptual and Motor Skills, 79*, 1527-1531.

Wiseman, R. & Greening, E. (2002). The mind machine: A mass participation experiment into the possible existence of extrasensory perception. *The British Journal of Psychology, 93*, 487-499.

Wolfradt, U., Oubaid, V., Straube, E. R., Bischoff, N., & Mischo, J. (1999). Thinking styles, schizotypal traits and anomalous experiences. *Personality and Individual Differences, 27,* 821-830.

"SO FAR AND YET SO CLOSE" – A GESP-EXPERIMENT INTEGRATING THE MODEL OF PRAGMATIC INFORMATION (MPI) AND THE WEAK QUANTUM THEORY (WQT)

Ronald Weigl

Cognitive Psychology Unit (CPU), Department of Psychology, Klagenfurt University

INTRODUCTION

The main objective of this project is to design a new experiment based on the ganzfeld procedure (Hyman & Honorton, 1986; Milton & Wiseman, 1999), but also to integrate the concepts and ideas of the model of pragmatic information (MPI) by Lucadou (1995, 1997, 2004) and the weak quantum theory (WQT) by Atmanspacher, Römer and Walach (2002) (see also Walach, 2003). These two system-theoretical and physical theories offer a good theoretical background on psi phenomena while providing information on how an experiment should be designed to increase the chance of success. Factors like defocusing from the task of an experiment, increasing the freedom of the participants to accomplish their task and the "importance" of the experiment itself. Lucadou uses the term pragmatic information to describe meaningful information in a system, and in his MPI he states that a balance of novelty and confirmation has to be established to enhance the probability of a successful experiment (Lucadou, 1997). In order to do so, the ganzfeld setting was modified and combined with the setup of a more controversial experimental procedure testing the remote staring effect (Braud, Shafer & Andrews, 1993b; Radin, 2005; Schlitz & Braud, 1997; Schmidt, Schneider, Utts & Walach, 2004).

This study also focuses on the question how strong the influence of a systemic entanglement (comparable to the existence of countertransference phenomena in psychotherapy and the phenomenon of "deputy" perception in system-therapeutic settings) of two subjects is, operationalized by the scores in a questionnaire to measure the connectedness of participants (Schmidt, 2002; Schmidt, Tippenhauer & Walach, 2001; Tippenhauer, 2000), in their ability to communicate by non-sensory means. This questionnaire was presented at the 44th Annual Convention of the Parapsychological Association and consists of 27 questions asking for a judgement of the relationship in question. These items can be categorized into four factors, "Exchange", "Autonomy", "Emotional Closeness" and "Coherence/Symbiosis". Before and after these questions a global judging scale of the relationship from 0 to 100 has to be filled out, and at the end some demographic questions are included. Although the influence of different kinds of participant relationships as a predictor for their success in psi experiments has been discussed in studies on ganzfeld and remote staring (Alexander & Broughton, 1999; Braud, Shafer & Andrews, 1993a; Broughton & Alexander, 1996), the advantage of this questionnaire is the focus on the way each participant views the relationship in question, independent of commonly used relational terms. Friends can feel closer than siblings, lovers closer than consanguineous relatives. The main interest of this study will be the correlation of the questionnaire scores with the results of the combined ganzfeld-remote staring experiment.

The original idea of such an experiment (Weigl, 2005) was further modified to provide the ideal conditions for an effect by selecting the volunteering participant pairs via a questionnaire based on their belief in the existence of psi (Lawrence, 1993), being musically or artistically talented (Schlitz & Honorton, 1992) and practicing a mental discipline, such as meditation and martial arts (Honorton, 1997). Furthermore, the ideas of the MPI and WQT were insofar integrated in the procedure of the experiment that the participants could decide themselves who was going to act as sender first (the participants swapped roles after the first 20 trials of a session, so each one of them was acting as a sender and receiver for one half of the total session) and if they wanted feedback. The participants were also informed about possible strategies to accomplish their task, using any kind of extrasensory communication they could think of or had experienced before. In addition to the intended remote staring effect using a webcam the experimenter presented additional options including the sending of symbols, colours, words, etc. and the possibility to try a distant mental influence on the body of the receiver. The participants' liberty to choose was intended to maximise the organizational closure and pragmatic information within the system of sender and receiver (Lucadou, 1997).

METHODS

Participants

Students at Klagenfurt University were invited either via email to participate in this experiment or by personal invitation in two classes the author was tutoring. The invitation included a questionnaire on belief in psi, creativity, practice of a mental discipline, etc., and of the 149 volunteering pairs 35 took part in the experiment after being selected by their answers. In order to be selected the belief in psi of each participant had to be no less than five on a seven point scale (seven being the maximum), and at least one participant of each pair had to be creative and practice a mental discipline. A minimum of 64 participants was necessary for a pre-selected medium effect size of d=0,5 (p=.05) and a power of 1-β=0.8, and to ensure this limit would be met 70 were tested. These pairs consisted of males and females or females and females in any kind of relationship, being friends, related, siblings or lovers.

Apparatus/Materials

The experiment took place in two separate rooms at Klagenfurt University being far away from each other enough to prohibit sensory leakage. A true random number generator (RNG) in the experimenter/sender room was used for a binary decision between a 0 trial (no effect intended) and a 1 trial ("activation" of the other participant). The only connection between the sender and the receiver was an audiovisual data link via the www using the programme MSN Messenger which was operated by the experimenter. The receiver could be heard and seen (except during a 0 trial) via a webcam and microphone by the sender at all times, the sender was only heard by the receiver before and after a trial. A total of 40 trials per pair were executed, with the participants being blind to the fact that the experiment consisted of exactly ten 0 and ten 1 trials per participant.

Procedure

After the purpose of the study and the process of the experiment were explained to the participants, the experimenter left the room while they were filling out the questionnaires on their connectedness and had time to discuss their strategy how they wanted to connect to each other by non-sensory means, as discussed above. Later on the participants were separated, one of them (the receiver) going into a ganzfeld state in a soundproof room and the other one staying with the experimenter in the sender room. The receiver listened to a 16 minute muscle relaxation exercise to help him relax and focus on the task ahead. After the exercise the experiment session was started by saying "ready". This was the signal to disconnect the audio-connection between the participants and start the RNG. Instead of trying to send a picture or video sequence like in regular ganzfeld experiments, the sender had only to "reach" or "activate" the receiver using the agreed on strategy in case of a 1 trial, or relax and take his mind off the experiment in case of a 0 trial. The receiver, being blind to the decision of the RNG, could take as long as needed to detect if it was a 0 or 1 trial. The only thing of interest was *if* the sender tried to transmit something. The exact identification of the stimulus by the receiver, if it was coherent with the strategy or felt differently, was (unlike other ganzfeld procedures) not in question. If the sender thought he felt something he had to say "yes", if not "no". After the decision was made and recorded the connection was established again so that the sender and receiver could communicate again and if desired the receiver got feedback on his choice. This communication should also increase the cohesion of the participant system, since they could use the time to reconsider their strategy.

The procedure was repeated 20 times, the first trial being a test-trial off the record. Upon completion the agents switched roles and the next 20 (21) trials took place. Afterwards, the participants were told they would be informed about the results of the study once the analyses is finished and were thanked for their cooperation.

Hypotheses

1. A deviation from the expected 50% chance level of right and wrong guesses, with significantly more right answers.
2. The higher the connectedness-questionnaire-score concerning the factors “Exchange”, “Emotional Closeness” and “Coherence/Symbiosis”, the stronger the expected deviation from chance.
3. A general decline effect for the whole experiment and a decline effect of right answers at the end of the 20 trials.
4. A gender influence on the rate of success.

RESULTS

In accordance with the predictions of the MPI (Lucadou, 1997), and in order to allow a maxmium of organizational closure in the system of the participants, the results will not be processed until the whole experiment is over. Preliminary results will be presented at the conference.

Planned Analyses

Possible analyses methods are being discussed at Klagenfurt University at the moment. For hypothesis 1 and 3 analyses with inferential statistics are planned, for hypothesis 2 and 4 a binary logistic regression might be performed. In addition, variables such as age, duration of relationship, belief in psi, etc., will also be correlated with the success of the participants in each trial. A special focus will be on the relationship of the participants and the score in the global scale of connectedness (0-100). Post hoc tests will be done where appropriate.

REFERENCES

Alexander, C. H. & Broughton, R. (1999). CL1-Ganzfeld Study: A Look at Brain Hemisphere Differences and Scoring in the Autoganzfeld. *The Parapsychological Association 42nd Annual Convention. Proceedings of Presented Papers* (pp. 3-18).

Atmanspacher, H., Römer, H. & Walach, H. (2002). Weak Quantum Theory: Complementarity and Entanglement in Physics and Beyond. *Foundations of Physics, Vol. 32, No. 3,* 379-406.

Braud, W. G., Shafer, D. & Andrews, S. (1993a). Further Studies of Autonomic Detection of Remote Staring, New Control Procedures, and Personality Correlates. *Journal of Parapsychology, 57,* 391-409.

Braud, W. G., Shafer, D. & Andrews, S. (1993b). Reactions to an Unseen Gaze (Remote Attention): A Review, with New Data on Autonomic Staring Detection. *Journal of Parapsychology, 57,* 373-390.

Broughton, R. S. & Alexander, C. H. (1996). Autoganzfeld II: An Attempted Replication of the PRL Ganzfeld Research. *Journal of Parapsychology, 61,* 209-226.

Honorton, C. (1997). The ganzfeld novice: four predictors of initial ESP performance. *Journal of Parapsychology, 61,* 143-158.

Hyman, R. & Honorton, C. (1986). A Joint Communiqué: The Psi Ganzfeld Controversy. *Journal of Parapsychology, 50,* 351-364.

Lawrence, T. (1993). Gathering in the Sheeps and Goats: A Meta-Analysis of Forced Choice Sheep/Goat ESP Studies, 1947-1993. *The Parapsychological Association 36th Annual Convention. Proceedings of Presented Papers* (pp. 75-86).

Lucadou, W. v. (1995). *Psyche und Chaos. Theorien der Parapsychologie.* Frankfurt/M. und Leipzig: Insel Verlag.

Lucadou, W. v. (1997). *Psi-Phänomene. Neue Ergebnisse der Psychokinese-Forschung.* Frankfurt/M. und Leipzig: Insel Verlag.

Lucadou, W.v. & Zahradnik, F. (2004). Predictions of the Model of Pragmatic Information about RSPK. *The Parapsychological Association 47th Annual Convention. Proceedings of Presented Papers* (pp. 99-112).

Milton, J. & Wiseman, R. (1999). Does Psi Exist? Lack of Replication of an Anomalous Process of Information Transfer. *Psychological Bulletin, 125,* 387-391.

Radin, D. I. (2005). The Sense of Being Stared At: A Preliminary Meta-Analysis. *Journal of Consciousness Studies, 12(6),* 95-100.

Schlitz, M. J. & Braud, W. G. (1997). Distant Intentionality and Healing. Assessing the Evidence. *Alternative Therapies in Health and Medicine, 3(6),* 62-73.

Schlitz, M. & Honorton, C. (1992). Ganzfeld Psi Performance Within an Artistically Gifted Population. *Journal of the American Society for Psychical Research, 86,* 93-98.

Schmidt, S. (2002). *Außergewöhnliche Kommunikation?Eine Kritische Evaluation des Parapsychologischen Standardexperimentes zur Direkten Mentalen Interaktion.* Oldenburg: BIS-Verlag.

Schmidt, S., Schneider, R., Utts, J. & Walach, H. (2004). Distant Intentionality and the Feeling of Being Stared at: Two Meta-Analyses. *British Journal of Psychology, 95,* 235-247.

Schmidt, S., Tippenhauer, G. & Walach, H. (2001). Connectedness Between Participants in an Experiment on Distant Intention. *The Parapsychological Association 44th Annual Convention. Proceedings of Presented Papers* (pp. 285-300).

Tippenhauer, G. (2000). *Das Konstrukt der Verbundenheit in Zwischenmenschlichen Beziehungen. Entwicklung eines Fragebogens zur Erfassung von Verbundenheit.* Unpublished Masters Thesis, Albert-Ludwigs-Universität Freiburg i.Br.

Walach, H. (2003). Generalisierte Quantentheorie (Weak Quantum Theory): Eine Theoretische Basis zum Verständnis Transpersonaler Phänomene. In: W. Belschner, L. Hofmann & H. Walach (Eds.) *Auf dem Weg zu einer Psychologie des Bewussteins* (pp. 13-46). Oldenburg: BIS-Verlag.

Weigl, R. (2005). So far and yet so close – An Extrasensory Perception Experiment with Integration of the System-Theoretical Model of Pragmatic Information (MPI). *Abstracts of the 7th Alps-Adria Conference in Psychology* (pp. 224-225).

Address for correspondence: Ronald Weigl,
Nautilusweg 5/1, A 9020 Klagenfurt,
Austria/EUROPE.
E-mail: rweigl@edu.uni-klu.ac.at

DO OUT-OF-BODY EXPERIENTS HAVE BETTER VISUAL IMAGERY SKILLS THAN NON-EXPERIENTS?

David J. Wilde, Craig D. Murray & Jezz Fox
School of Psychological Sciences, University of Manchester
Manchester, United Kingdom

INTRODUCTION

According to Blackmore (1984) at least two things are needed for an OBE to occur: the failure of the somatosensory input-controlled model, and the substitution of an imagery-based one built-up from memory. Therefore, for Blackmore the OBE represents an attempt by the brain to re-establish a model of the self within the environment. The 'bird's-eye' point-of-view commonly reported by out-of-body experients (OBErs) is said by Blackmore to be due to the economical way in which environmental information is stored in and recalled in memory.

Blackmore suggests that if OBEs are in part an imaginal experience, then OBErs might be expected to have better visual imagery skills than non-OBErs. This contrasts with Irwin's dissociational theory, in which he argues that only a basic visual-spatial skill is required (in conjunction with other factors) for an OBE to occur. However, the research on this issue provides a mixed picture (see Alvarado, 2000).

Perhaps the strongest evidence for better visual imagery skills in OBErs comes from Blackmore (1983a, 1987), who asked OBErs and non-OBErs to imagine familiar scenes and try to switch their viewpoint to other and more unfamiliar viewpoints of the same scene. OBErs were (self-reported to be) better able to switch viewpoints in imagined scenes, although they did not remember scenes any more frequently from above than at eye-level. However, it is not known if this self-reported ability is indicative of actual ability or reflective of a cognitive bias in OBErs to simply report the task to be easier than non-OBErs.

In a precursor to the present study, Murray, Fox and Wilde (2006) explored the relationship between paranormal belief and performance on visual imagery measures and tasks. They pointed out that OBErs tended to score higher on measures of paranormal belief, which in turn has been found in the research literature to be related to a number of cognitive distortions.[1] In Murray et al's study involving a student sample of predominantly non-OBErs a positive correlation between self-reported ability and performance on a bird's eye visual imagery computer task was found. However, paranormal belief and performance on the bird's-eye view task were negatively correlated, indicating participants high in paranormal belief made more incorrect identifications.

Given that OBErs tend to score higher on measures of paranormal belief (around 50% higher that the mean for the whole sample in the present study — see Murray & Fox, 2004, 2005) this suggests that OBErs might perform worse than non-OBErs on the same task. Only 5 of the 46 participants in Murray et al.'s study reported a prior OBE, but an exploratory analysis of the data indicated a tendency for them to score higher in paranormal belief and lower on the computer bird's-eye view task than non-OBErs.

The design of the present study sets out to compare the performance of OBErs against non-OBErs on a computer-administered visual imagery task than non-OBErs, and to examine the relationship between self-reports of imaginal visual imagery (which are not open to verifiable observation by the researcher) and performance on a computer-administered visual imagery task. Based upon the body of literature on the

[1] It should be noted that the research literature on this topic provides a more complex picture than we have space to review. We would refer the reader to Targ et al. (2000; pp.238-239) for more detail.

relationship between paranormal belief and cognitive styles (see Murray, Fox & Wilde, 2006), and the higher levels of paranormal belief characteristically found with OBErs, it was hypothesised that OBErs would self-report better performance on an imagination task which involved switching viewpoints, but that they would perform significantly poorer on all computer task measures.

METHODS

Participants

Participants were recruited via two methods: 1) from a list of people who had been participants in previous OBE studies and who have indicated they would be interested in taking part in further research; and 2) via posters and advertisements on email distribution lists at Manchester and Liverpool Hope Universities inviting them to take part in a study of visual imagery and paranormal belief. A total of 33 people took part in the study (10 OBErs, 23 non-OBErs, with a mean age of 25.1, SD = 10.1) which took approximately 45 minutes.

Materials

Blackmore's Imagination Task: This scale assesses (1) the habitual visual recall of familiar environments and (2) the ability of participants to switch imaginary viewpoints within the scenes recalled. The participant is asked to recall 6 familiar environments (e.g. their bedroom, the last time they were at the seaside) and for each environment is asked whether they recall the scene from "eye-level, as you would have seen it at the time of being there", "from above, as though watching yourself ", or "from some other vantage point". They are then asked to imagine the same scene again and asked the following: "Try to imagine the [e.g. bedroom] again. Can you try and switch to a different viewpoint?" Next they are asked "How easily could you do this? (1) Easily, (2) able to do so, but with difficulty, or (3) could not do so?" Depending on the response chosen by the participant they are given a score of 2, 1 and 0 respectively. The range of possible scores on each sub-scale is 0-12.

Belief in the Paranormal Scale (BPS): The BPS is an 8-item measure designed to assess respondents' level of belief in paranormal phenomena (Musch and Ehrenberg, 2002). The range of possible scores on the scale is 8-48. It was hypothesised that OBErs would score significantly higher in paranormal belief than non-OBErs.

The Vividness of Visual Imagery Questionnaire (VVIQ): Marks (1973) VVIQ is a 32-item measure of manipulation of imagination and visual imagery skills. The respondent is asked to imagine four different scenarios. Each participant is asked to go through the four scenarios twice, the first time imagining the scenarios with their eyes open, and the second time with their eyes closed. The task is split into Part A (eyes open, 4 scenarios, 16 questions) and Part B (eyes closed, 4 scenarios, 16 questions). For each question, the participant is asked to rate the vividness of each image on a 5-point scale. The possible range of scores for each part and for the whole task are: Part A (16-80), Part B (16-80), complete task (32-160).

The Space Relations Test (SRT) - taken from the Differential Aptitude Tests (DAT) battery: The SRT is a 60-item measure that tests participants' ability to visualise a three-dimensional object from a two-dimensional pattern and to visualise how this object would look if rotated in space. A score of 1 is given for a correct choice and 0 for and incorrect choice, giving a possible range of scores from 0-60. Blackmore (1983a) has previously found OBErs to score higher on the Space Relations test OBErs (mean = 46.2) than non-OBErs (mean = 41.3) but the difference was not significant.

Item for Assessing the Occurrence of Out-Of-Body Experiences: Participants were asked to indicate 'yes' or 'no' to the following statement from Palmer (1979): "Have you ever had an experience in which you felt that 'you' were 'outside of' or 'away from' your physical body; that is, the feeling that your consciousness, mind, or centre of awareness was at a different place than your physical body? (If in doubt, please answer 'no')."

Computer Visual Imagery Task: A computer software package (Carrera 3-D Basics) was used to construct two sets of stimuli images from galleries of backgrounds and other visual image elements (such as, bottles, planes, etc.). Two sets of images were produced using this method, an 'eye-level' set and a 'bird's-eye' level set. The eye-level set consisted of 20 sets of 4 (80 in total) unique colour images. The bird's-eye level set consisted of 20 sets of 8 (160 in total) unique colour images. It was hypothesised that OBErs would perform significantly poorer on all computer task measures. These images were imported into a computer program (reCOG). The computer program was presented on an Apple Mac with a touchscreen. All participants received the same verbal instructions when being asked to complete the computer task:

> *"During the experiment you will be shown a series of images on the computer screen. After each image is shown the computer will present you with a choice of four possible corresponding images. Only one of each four options will be the correct corresponding image. I would like you to pick the image which you think is the correct corresponding image as quickly as possible. Do you have any questions?"*

Procedure

Participants first completed Blackmore's Imagination Task, followed by the Vividness of Visual Imagery Questionnaire, The Space Relations Test, the Belief in the Paranormal Scale, and Palmer's item for assessing the occurrence of out-of-body experiences. Following this, participants were asked to complete the computer visual imagery task. A set of standardised instructions were administered (see previous section). The participant was then presented with one of the eye level target images described above on a computer screen. Each target image was first presented from an eye-level perspective for a period of 10 seconds. Following the presentation of each image, the participant was then presented with a choice of four images of the same scene but shown from either an 'eye-level' perspective or a 'bird's-eye level' perspective. The four images comprised of one correct target image and 3 other images of similar scenes but with the object elements in the scene rotated by 90, 180 and 270 degrees so as not to be identical to the target image. The participant had five seconds to make their choice. After five seconds, if no choice was made then the computer counted this as a 'miss' and moved onto the next trial. For the 'eye-level' image sets the participant was required to complete a simple recognition task. For the 'bird's-eye level' picture sets this involved a greater degree of visual imagery manipulation. The computer chose the images at random from a pool of images. One target image presentation and the presentation of its corresponding target/choice images represented 1 trial. The participant was asked to first complete a short practice run of 3 trials (not analysed) before completing the main task, which was 40 trials.

RESULTS

Participants' mean scores (with standard deviations) for each study measure are shown in Table 1, along with the mean ranks and results of Mann-Whitney U tests. The results of the inferential statistical analysis showed that OBErs scored lower than non-OBErs (indicative of better self-reported visual imagery with the eyes open) on Part A of the Vividness of Visual Imagery Questionnaire ($U=61.5$, $p=.018$) and higher on the Belief in the Paranormal Scale ($U=111.0$, $p=.006$). There were no other significant differences.

TABLE 1. DIFFERENCES BETWEEN OBERS AND NON-OBERS ON THE STUDY MEASURES

Measure	OBErs (n=10)		Non-OBErs (n=23)		P Value
	Mean (SD)	Mean Rank	Mean (SD)	Mean Rank	
Blackmore's Imagination Task 1	2.6 (2.0)	17.8	2.4 (2.2)	16.6	.380
Blackmore's Imagination Task 2	9.7 (1.8)	20.5	8.7 (1.9)	15.5	.08
Vividness of Visual Imagery Test A	36.1 (7.4)	11.6	42.6 (8.3)	19.3	.018
Vividness of Visual Imagery Test B	39.9 (17.8)	17.4	37.8 (12.4)	16.8	.443
The Space Relations Test	40 (11.5)	16.1	39.8 (12.3)	17.4	.375
Belief in the Paranormal Scale	28.3 (11.2)	23.25	18.6 (6.6)	14.3	.006
Computer Task – Eye-Level Set No. Correct	19.4 (.84)	16.0	19.6 (.49)	17.4	.352
Computer Task – Eye-Level Set Reaction Time	1.6 (.25)	19.6	1.5 (.59)	15.9	.162
Computer Task – OBE Set No. Correct	8.8 (2.6)	14.6	9.9 (3.7)	18.0	.183
Computer Task – OBE Set	3.2 (.45)	16.3	3.2 (.52)	17.3	.401

A summary of the correlations between the study's measures are shown in Table 2. Significant correlations were found between Part 2 of Blackmore's Imagination Task and Part B (eyes closed) of the Vividness of Visual Imagery Scale (r = .374, $p < 0.05$, 2-tailed), and between the number of correct responses made on the Space Relations Test and the OBE set of the Computer Task (r = .454, $p < .01$, 2-tailed).[2] There were no significant correlations between Belief in the paranormal and performance on any of the study measures.

TABLE 2. A SUMMARY OF SPEARMAN CORRELATIONS BETWEEN THE STUDY MEASURES

	Measure	1	2	3	4	5	6	7	8	9	10
1	Blackmore's Imagination Task 1	-	.086	.009	-.085	-.157	-.004	.008	.123	.013	.041
2	Blackmore's Imagination Task 2	.086	-	-.035	.374*	-.091	.132	-.283	.160	.102	-.105
3	Vividness of Visual Imagery Test A	.009	-.035	-	.528**	.115	-.040	-.146	-.054	.068	-.049
4	Vividness of Visual Imagery Test B	-.085	.374*	.528**	-	.172	.076	-.132	-.114	.104	-.235
5	The Space Relations Test	-.157	-.091	.115	.172	-	-.230	.008	-.057	.454**	-.049
6	Belief in the Paranormal Scale	-.004	.132	-.040	.076	-.230	-	.014	.246	-.251	.107
7	Computer Task – Eye-Level Set No. Correct	.008	-.283	-.146	-.132	.008	.014	-	-.408*	-.037	.014
8	Computer Task – Eye-Level Set Reaction Time	.123	.160	-.054	-.114	-.057	.246	-.408*	-	-.261	.406*
9	Computer Task – OBE Set No. Correct	.013	.102	.068	.104	.454**	-.251	-.037	-.261	-	-.467**
10	Computer Task – OBE Set Reaction Time	.041	-.105	-.049	-.235	-.049	.107	.014	.406*	-.467**	-

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

[2] It should be noted that due to the large number of correlations conducted, even though a two-tailed level of significance is used, there exists the possibility of a type l error.

Discussion

This study aimed to find out if OBErs had better visual imagery skills than non-OBErs by comparing self-report measures of visual imagery skills, namely Blackmore's Imagination Task and the Vividness of Visual Imagery Questionnaire (VVIQ), with more objective tests of visual imagery ability, the Spatial Relations Test (SRT) and the reCOG computer programme. The hypothesis was that OBErs would score higher on the self-report measures and lower on the objective tests. The only significant result found regarding difference in performance between self-report and objective measures was that OBErs scored lower than non-OBErs on Part A of the VVIQ (the eyes open task). This is a subjective report of how vivid a person's visual imagery of recalled scenes, objects and people are to them.

The mean scores which OBErs and non-OBErs obtained in the present study on Part 2 of Blackmore's Imagination Task (9.7 compared to 8.7) are comparable to those of Murray et al.'s smaller OBE sample (9.8 compared to 9.12) and the statistically different scores obtained by Blackmore herself (1987) with a larger sample (10 compared to 9). When comparing the group means on observable performance of visual imagery ability on the OBE set of the reCOG computer task; OBErs scored lower than non-OBErs (8.8 compared with 9.9) (as they did in Murray et al's study). However, against prediction, there was not a negative relationship between Paranormal Belief and performance on the OBE reCOG computer task.

Whilst nothing conclusive can be deduced from this exploratory analysis, the evidence suggests that when self-reporting visual imagery skills, OBErs are prone to overestimate their ability. Yet when put to the test using objective measures, they actually perform worse than non-OBErs.

The main limitation to note about this study is the small OBE sample. This limits us to drawing firm conclusions regarding the study hypotheses. However, if these findings were repeated with a larger OBE sample this would add support to Irwin's claim that only a basic visual-spatial skill is required for a person to have an OBE, rather than supporting Blackmore's claim of more developed visual skills in OBErs.

Acknowledgements

This research was supported by a Parapsychological Association Research Endowment and the Bial Foundation. We would like to express our gratitude to both. We would also like to thank two anonymous reviewers for their constructive comments on an earlier draft of this paper.

References

Alvarado, C.S. (2000). Out-of-body Experiences. In Cardeña, E., Lynn, S.J. and Krippner, S. (Eds.) Varieties of Anomalous Experience: Examining the Scientific Evidence. Washington, DC: American Psychological Association. (pp. 183-218).

Blackmore, S.J. (1983a). Imagery and the OBE. In Roll, W.G., Beloff, J. and White, R.A. (Eds.) Research in Parapsychology (1982) Metuchen, NJ: Scarecrow Press. (pp.231-232).

Blackmore, S.J. (1984). A psychological theory of the Out-of-body Experience. Journal of Parapsychology, 48, 201-218.

Blackmore, S.J. (1987). Where am I? Perspectives in imagery and the Out-of-body Experience. Journal of Mental Imagery, 11, 53-66.

Murray, C.D. and Fox, J. (2004). Body image in respondents with and without Out-of-body Experiences. In S. Schmidt (ed.) Proceedings of the Parapsychological Association, 47th Annual Convention, pp.145-156.

Murray, C.D. and Fox, J (2005). The Out-of-body Experience and body image: differences between experients and non-experients. Journal of Nervous and Mental Disease, 193(1), 70-72.

Murray, C.D., Fox, J. and Wilde, D. (2006). The relationship between belief in the paranormal and performance on a visual imagery task: do Out-of-body Experients have better visual imagery skills than non-experients? Journal of the Society for Psychical Research, 70(3), 170-176.

Musch, J. and Ehrenberg, K. (2002). Probability misjudgement, cognitive ability, and belief in the paranormal. British Journal of Psychology, 93, 169-177.

Palmer, J. (1979). A community mail survey of psychic experiences. Journal of the American Society for Psychical Research, 73, 221-251.

Targ, E., Schlitz, M. and Irwin, H.J. (2000). Psi-related experiences. In Cardeña, E., Lynn, S.J. and Krippner, S. (Eds.) Varieties of Anomalous Experience: Examining the Scientific Evidence. Washington, DC: American Psychological Association. (pp.219-252).

THE COMMUNICATIVE ORDER OF SPONTANEOUS PSI: AN OVERVIEW OF SCHEGLOFF'S 'ON ESP PUNS'

Robin Wooffitt

Department of Sociology
University of York
Heslington
York YO10 5DD
UK

INTRODUCTION

In this brief paper I want to outline an informal analysis conducted by Emanuel Schegloff, Professor of Sociology at the University of California in Los Angeles, and published in a paper called 'On ESP Puns'. The paper is available as a contribution to an edited collection (Schegloff, 2003) but was originally made available in 2002 on Schegloff's website (http://www.soc.ucla.edu/faculty/schegloff/pubs/index.php0).

Extracts cited in this research note come from this earlier version of the paper.

Why should this paper be the subject of a Research Note at a Parapsychological Association Convention? As will become apparent, his analysis is of direct relevance to parapsychology. But it is published in an edited collection which addresses issues in language and social interaction. It is unlikely, then, to come to the attention of the wider parapsychological community. Hopefully, this brief introduction will raise the profile of Schegloff's work among the parapsychological community, and encourage parapsychologists to study his paper in full, and develop his analytic leads.

There is another reason why parapsychologists may be interested in Schelgoff's work and this has to do with his status within the field of scholarship and research he has helped develop.

Conversation analysis (CA) is a formal qualitative method for the analysis of naturally-occurring verbal interaction. It developed from the groundbreaking work of the US scholar, Harvey Sacks (Sacks, 1992). The approach to the analysis of verbal communication he developed in his lectures and formal publications, although known as conversation analysis, might more accurately be called the analysis of the interactional organisation of social activities in talk. This reflects CA's treatment of talk as site of social action, rather than as merely a mechanism of information exchange.

Although Sacks originally developed CA, from the start he worked with colleagues, and Schegloff was one of his closest collaborators. Schgeloff's own publications in CA started in the later 1960s (Schegloff, 1968), and in the early years of the field he collaborated with Sacks and another colleague, Gail Jefferson, in producing what are now recognised as seminal studies of the organisation of a range interactional phenomena, for example, the mechanisms of turn taking (Sacks et al, 1974), the procedures for correction (Schegloff et al 1977), and so on.

Tragically, in 1975, Sacks was killed in a car accident. Since then, Schegloff has emerged as perhaps the leading figure in CA. His has produced a range of empirical studies which are exemplary in the way in which they reveal the infrastructure of interactional processes (for example, Schegloff, 1980, 1986, 1992a; Schegloff and Sacks, 1973). He has also engaged in numerous debates with scholars in cognate disciplines - linguistics, philosophy, political sociology, psychology, and neuroscience - in which he has advanced the argument for the CA perspective (for example, Schegloff, 1988a, 1988b, 1991, 1997, 1999). Here, then, is a major international figure - not just in CA, but in the study of communication more generally - who is writing about ostensible psi phenomena, and who, as we shall see, takes seriously the possibility that ESP may be implicated in the organisation of, and a component in, social interaction.

Verbal puns on the contents of consciousness

Schegloff (2002) begins by noting that, like many scholars of communication, he is in the habit of noticing instances of phenomena of analytic interest as they occur in everyday life. One such phenomenon is puns. The kind of pun which may have relevance to parapsychology first came to his attention some years ago while working in his office with a colleague, Gail Jefferson. Jefferson was smoking a cigarette, and using her other hand to make notes. At one point, Schegloff noticed that Jefferson brought the pencil to her mouth instead of the cigarette. This reminded him of an event he had witnessed as a graduate student when a lecturer had used a piece of chalk to relieve an itch in his ear, only to leave the chalk poking out of his ear when he subsequently removed his hand.

Schegloff then reports:

The recollection of [this] incident apparently brought a smile to my face, a smile which Jefferson noticed and understood to be responsive to her miscue in bringing the pencil rather than the cigarette to her mouth. Displaying her grasp of my smile's source, she remarked, "Oh, that's an earmark of mine."

I registered the pun-like character of her remark, the interest in vernacular poetics being one shared by the two of us... I was about to comment on the one I had just heard from Jefferson when I realized that the comment "Oh that's an earmark of mine" constituted a pun on something which had not been said but had only been 'thought' or 'recollected' or 'flashed'. It was, in that sense, an ESP pun, however absurd that appeared to be to someone who did not believe in parapsychological phenomena. (Schegloff, 2002:1-2; original emphasis)

From that moment on, Schegloff began to catalogue other instances in which a co-participant produced a pun on something he was thinking. This is another example.

My wife and I are visiting our daughter at college. Sitting at lunch, I ask my daughter what she'll be working at after lunch. She says "recycling" (this being a volunteer activity previously described to us as involving picking up recyclable trash left by residents of the area). I think to myself, "my daughter the garbage collector," and my daughter then says/continues, "...hence my garb'. (Schegloff, 2002:5)

Having mentioned these ESP puns in classes and to colleagues, other people reported similar cases. Schegloff reports this case, for example, which was offered by a colleague (Myrna):

Beth no. 1 and Myrna are former classmates at CSU, and Myrna and Beth no.2 are former classmates from UCLA. Beth no. 1 and Beth no. 2 had not met each other before this day.

Beth no 1 and Myrna had already sat down at the table in the Cafe; our meals had been given to us in 'proper' bowls and plates. Beth no. 2 sat down and I noticed that her meal was in a 'take-away' box. Then:

Beth no 2: I don't know why she (the server) gave my my meal in this

Mryna: (thought to herself: cause you eat like a bird and you'll probably need to take home half your meal anyway)

Beth no 1: she (the server) probably thought you were going to fly.

(Schegloff, 2002: 9)

Schegloff does not offer the kind of systematic analysis associated with CA research because this ESP/pun phenomenon is only available via introspection by one of the participants, and analysts working in this tradition strongly resist the use of intuition in favour of analysis of recordings and transcripts of interaction. His paper is therefore offered as a preliminary account of a phenomenon of social interaction which seems to be suggestive of psi interaction. But his observations do illustrate the kind of insight generated by the application of a conversation analytic mentality (Schenkein, 1978:1).

First, Schegloff identifies some of the recurrent properties of the phenomenon. Space limitations do not permit a full account of his observations on the corpus he presents in his paper, but we can summarise them here:

- The verbalised pun seems to trade-off an unspoken thought or image in a co-participants' consciousness.
- The pun may contain an error; but that error is essential to the utterance being heard as a pun. For example, in the instance in which Schegloff first noted the phenomenon, 'oh that's an earmark of mine' is clearly an incorrect attempt at 'trademark'.
- The lexical choices out of which the puns are constructed are unusual, in that they are not routine figures of speech used by the participants.
- Finally, the pun may be mildly inappropriate in the context for which it is produced.

These properties suggest that ESP puns are systematic and recurrent events.

Second, his observations show how ESP puns are deeply implicated in the routine fabric of everyday interaction. This raises a question for future research: are ESP puns associated with particular kinds of activity sequence?

Third, Schegloff's observations emphasise the social component of ESP puns: they are built out of particular lexical choices, the organisation of which has been shown to have a social or interactional orientation (for example, Sacks, 1979; Sacks and Schegloff, 1979); moreover, they are designed to display a particular kind of relationship to the context for which they are produced.

CONCLUSIONS

By way of conclusion, I would like to make three points.

If psi does not exist, Schegloff's analysis of the social context and interactional order of instances of what seem like anomalous communication will contribute enormously to our understanding of how coincidence and happenstance come to be interpreted as what seem to be compelling instances of paranormal phenomena.

If psi exists, then Schegloff's identification and preliminary analysis of verbal puns on mental phenomena which occur naturally in social interaction illustrate how a CA perspective can illuminate the ways in which processes of anomalous communication are integrated within socially organised interpersonal activities. This provides a new perspective on anomalous communication: instead of viewing psi simply as a form of information transfer between people's heads, it can be examined as a component of the socially ordered infrastructure of interpersonal relations. This will enhance our understanding of how psi works, and tell us something new about its properties as a feature of social interaction. Indeed, it might suggest a whole new line of inquiry, one which fully integrates parapsychological and sociological concerns.

Finally, and relatedly: despite its considerable achievements, as a discipline parapsychology is still regarded by many academics as a pseudo-science which does not merit recognition as a legitimate scientific endeavour. Parapsychology might be said to lack friends in academe. Perhaps in Schegloff, it has found a new ally; and in conversation analysis, a new tool for research (see also, Wooffitt 1994; 2003; 2006); and in the study of ESP and the social organisation of verbal activities, a new field of inquiry: one through which parapsychology can forge collaborative links with established disciplines and on-going research projects, and thereby further secure its place in the academy.

ACKNOWLEDGEMENTS

I am grateful for the comments of two anonymous referees.

REFERENCES

Sacks, H. (1979). Hotrodder: a revolutionary category in G. Psathas (ed.) *Everyday Language: Studies In Ethnomethodology*. New York: Irvington, 7-14. (Edited by G. Jefferson from unpublished lectures: Spring 1966, lecture 18.)

Sacks, H. (1992). *Lectures on Conversation, Volumes I and II*, edited by G. Jefferson and E. A. Schegloff, Oxford and Cambridge, Mass.: Basil Blackwell

Sacks, H. & Schegloff, E.A. (1979). Two preferences in the organisation of reference to persons in conversation and their interaction in G. Psathas (ed.) *Everyday Language: Studies in Ethnomethodology*. Hillsdale, NJ: Erlbaum, 15-21.

Sacks, H., Schegloff, E.A., & Jefferson, G. (1974). A simplest systematics for the organisation of turn-taking for conversation. *Language 50*, 696-735.

Schegloff, E.A. (1968). Sequencing in conversational opening. *American Anthropologist, 70,* 6: 1075-1095.

Schegloff, E.A. (1980). Preliminaries to preliminaries: 'Can I ask you a question?' *Sociological Inquiry, 50,* 104-152.

Schegloff, E.A. (1986). The routine as achievement. *Human Studies, 9*, 111-152.

Schegloff, E.A. (1988a). Goffman and the analysis of conversation in P. Drew and and A.J. Wootton, Erving Goffman: *Exploring the Interaction Order*. Cambridge: olity Press, 89-135.

Schegloff, E.A. (1988b). Presequences and indirection: applying speech act theory to ordinary conversation. *Journal of Pragmatics*, 12, 55-62.

Schegloff, E.A. (1991). Reflections on talk and social structure in D. Boden and D. H. Zimmerman (eds.) *Talk and Social Structure: Studies in Ethnomethdology and Conversation Analysis.* Cambridge: Polity Press, 44-70.

Schegloff, E.A. (1992). Repair after next turn: the last structurally provided defense of intersubjectivity in conversation *American Journal of Sociology, 97,* 1295-1345.

Schegloff, E. A. (1997). Whose text? Whose context? *Discourse and Society 8*, 165-187.

Schegloff, E.A, (1999). Discourse, pragmatics, conversation, analysis. *Discourse Studies 1*(4), 405-35.

Schegloff, E. A. (2003). On ESP puns in Glenn, P., LeBaron, C. D., and Mandelbaum, J. (eds.) *Studies in Language and Social Interaction: In Honor of Robert Hopper*. Mahwah, NJ: Lawrence Erlbaum.

Schegloff, E.A., Jefferson, G. & Sacks, H. (1977). The preference for self-correction in the organisation of repair in conversation. *Language, 53*, 361-382.

Schegloff, E.A. & Sacks, H. 1(973). Opening up closings. *Semiotica, 7:* 289-327.

Schenkein, J. (1978). Sketch of the analytic mentality for the study of conversational interaction in J. Schenkein (ed.) *Studies in the Organisation of Conversational Interaction*. New York: Academic Press, 1-6.

Wooffitt, R. (1994). Analysing verbal accounts of spontaneous paranormal phenomena: a sociological approach, *European Journal of Parapsychology 10*, 45-63.

Wooffitt, R. (2003). Conversation analysis and parapsychology: experimenter-subject interaction in ganzfeld experiments. *Journal of Parapsychology, 6,* 299-324.

Wooffitt, R. (2006). *The Language of Mediums and Psychics: the Social Organization of Everyday Miracles.* Aldershot: Ashgate.

JOHN BELOFF: FORGING THE FUTURE OF PARAPSYCHOLOGY

Deborah L. Delanoy, Ph.D.

University of Northampton

ABSTRACT

John Beloff's legacy to parapsychology is profound and wide-ranging. Via personal memories, this presentation will highlight some of his educational, research and scholastic accomplishments. Also it will consider what is arguably John's greatest contribution to the field, namely serving as the architect behind the establishment of the Koestler Chair of Parapsychology.

John Beloff was the first parapsychologist I ever met, and it is because of him that I'm still working in the field. Undoubtedly my life, like so many of his students, would have been very different if not for his considerable influence and seemingly limitless knowledge of the field.

While John played a significant role in his student's lives, his contributions to parapsychology went far beyond those related to education. The breadth of his philosophical and experimental work is most impressive. While he may be best remembered for his philosophical writings, his experimental work was also wide-ranging, with his research including the application of the decay of radioactive material (uranium) to provide a truly random source in an early micro-PK study (with Evans, 1961), attempts to replicate Ryzl's ESP training method (with Mandleberg, 1966), as well as a variety of other forced-choice and free-response ESP research examining issues such as the impact of hypnosis, the sheep/goat effect; psycho physiological responses to remote stimuli, the experimenter effect and the agent-percipient relationship.

But perhaps his greatest contribution is the pivotal role he played in shaping the future of British parapsychology. He not only created the environment in which parapsychology was able to flourish at Edinburgh University, but also designed it's future via his role as the executor of the Koestler bequest and his critical involvement in the selection process that determined the holder of the Koestler Chair. The success of the Chair's selection process is well attested. While the ultimate impact of the Koestler bequest and Chair will be for historians to determine, there can be no debate that John indelibly changed the face of British parapsychology. John forged a strong future for parapsychology, leaving us all in an improved, richer and far more secure position.

.

REFERENCES

Beloff, J. & Evans, L. (1961). A radioactive test of psychokinesis. *Journal of the Society for Psychical Research, 41*, 41-46.

Beloff, J. & Mandleberg, I. (1966). An attempted validation of the "Ryzl technique" for training ESP subjects. *Journal of the Society for Psychical Research, 43*, 229-245.

WHAT I LEARNED FROM JOHN BELOFF

Richard Broughton, Ph.D.
University of Northampton

ABSTRACT

This contribution will present some pesonal reflections on lessons in parapsychology, in science, and in life learned as a student and colleague of John Beloff.

JOHN BELOFF: SOME PERSONAL RECOLLECTIONS OF MY MENTOR

Adrian Parker, Ph.D.

ABSTRACT

I draw on my own experiences and anecdotes of John to show how his qualities of eloquence, courage, and humility enabled him in the wake of the loss of parapsychology's place at Duke University, to re-instate parapsychology as an accredited university subject. We met by a series of apparently fortuitous events that first took me to Edinburgh and then led me to change from medicine to psychology. Without knowing of John's presence there, I had begun to be fascinated by hypnosis and psi, topics which I later discovered were the focus of his first project at Edinburgh.

In some respects, my personal experience of John is that he possessed many qualities which belonged to a bygone era, but these qualities also meant he was a man of his times by providing a steadfastness during was then a period of not only openness but also of social upheaval. It was just such qualities that enabled him to show that a research program in parapsychology could be conducted at Edinburgh without any threat to academia. It was this confidence created from his research and from his scholarly teaching which then provided the necessary and sufficient conditions for establishing the Koestler Chair at the university. Although John saw his role as executor of the Koestler Will as ethically preventing him from becoming its first professor, he possessed a psychological, philosophical and a parapsychological expertise which has rarely occurred since the days of William James. His critics were indeed met in a Jamesian manner with the rare gifts of a perceptiveness and an eloquence which enabled him to immediately grasp the nub of the argument being put forth and then to turn the owner around with a command of words which showed the door to common sense.

John's importance however did not diminish with the arrival of Bob Morris as professor at Edinburgh and the spread of parapsychology to other UK universities. John was active in the SPR, continued for some years as the editor of its journal, published his third and fourth books *The Relentless Question* (1990) and *Parapsychology - A Concise History* (1993) and edited a further one (with J. R. Smythies) *The Case for Dualism (1989)*. He gave us a legacy not only in establishing university parapsychology but confronted us with the *implications* of a critical yet positive parapsychology, and for John this meant a parapsychology that gave a central position to the study of spontaneous phenomena as well as experimental research.

At a personal level, John Beloff, through what in practice meant sacrificing his own career prospects, gave me and others the opportunity of making a university career out of parapsychology and gave me a commitment to show that with sufficient determination and willpower, this opportunity can be realized.

THE RANDI DINNER

Stanley Krippner, Ph.D.

Saybrook Graduate School,
USA

ABSTRACT

In 1982, when I was president of the PA, James Randi appeared on a panel of magicians that the program chair had arranged for the annual convention. The PA Council had just passed a resolution that put the Association on record that its members were advised to consult magicians when dealing with presumptive macro-PK phenomena. During the convention, held in Montclair, New Jersey, Randi invited John Beloff and me to dinner at his nearby home. During dinner, we discussed the PA resolution, and John described a young "metal bender" he and his team were investigating in Scotland. Randi agreed to develop a device in which a thin metal rod could be placed. However, if the device were opened or tampered with, a chemical would change color and reveal the deceit. Later, John gave the device to the young man, who claimed that he could only bend metal in the privacy of his home. When the device was returned, the metal was bent, the sealing wax was intact, but the chemical had changed color. John concluded that the wax had been melted, the metal had been bent by ordinary means, and the device had been resealed with the same wax. When Randi heard about this, he proclaimed that his "Project Beta" had been successful. Unlike "Project Alpha," in which Randi's confederates infiltrated a parapsychological laboratory as research participants, "Project Beta" simply required that Randi's advice be requested by a prominent parapsychologist. John Beloff was as prominent as they come.

REMEMBERING T.X. BARBER

Stanley Krippner, Ph.D
Saybrook Graduate School and Research Center

ABSTRACT

Theodore Xenophon Barber died on September 10th, 2005, in Framingham, Massachusetts. The cause of death was a ruptured aorta; he was 78 years of age. Ted Barber had an early interest in parapsychology, dating back to his high school days, and he served on the editorial board of *Advances in Parapsychological Research*, a series of research reviews I have edited since 1977 (e.g., Krippner, 1977). He was the J.B. Rhine banquet speaker at the St. Louis convention of the Parapsychological Association, where he discussed the possible connections between parapsychology and hypnosis, a field in which he pioneered what has become known as the social psychological paradigm of hypnotic response (Barber, 1995). With his partner, Sheryl C. Wilson, Barber co-authored the Creative Imagination Scale (1978, 1981), and published the results under the title, "The Fantasy-Prone Personality: Implications for Understanding Imagery, Hypnosis, and Parapsychological Phenomena" (Wilson & Barber, 1983). He also authored the Barber Suggestibility Scale, an instrument he used in a series of studies demonstrating that formal hypnotic induction procedures were not necessary to produce the effects typically associated with hypnosis (Barber & Wilson, 1978/1979). Instead, he conceived of hypnosis as heightened suggestibility, not an altered state of consciousness. Indeed, in some of his early papers, Barber placed the term "hypnosis" in quotation marks (e.g., Barber & Calverley, 1964), denoting that the word was a social construct, what I would consider a product of historically situated interchanges among people specific to times and places. In the late 1990s, Barber wrote a series of articles describing three distinct types of outstanding hypnotic subjects, the "fantasy-prone," the "amnesia-prone," and the "positively set" (e.g., 1999). Hence, there are three major dimensions involved in hypnosis: imagination, dissociation, and motivation. He saw hypnosis not as a single trait but as an interplay of various human potentials (Krippner, 1999). His book, *Hypnosis: A Scientific Approach* (Barber, 1995), attempted to place hypnosis in the mainstream of social psychology, and his book, *Pitfalls of Human Research* (Barber, 1976), described ten common errors made by students and scholars alike when studying their fellow humans. In *LSD, Marihuana, Yoga, and Hypnosis*, Barber (1970) explored human potentials from a scientific point of view and in *The Human Nature of Birds* (1993),he described how the cognitive capabilities of animals are more like those of humans than scientists thought possible (also see Barber, 1994). This was to have been followed up by a book tentatively titled *The Wisdom of the Cell,* in which Barber would extend complex behavior to apparently simple forms of life. This book also was to have extended his article, "Changing 'Unchangeable' Bodily Processes by Hypnotic Suggestions: A New Look at Hypnosis" (Barber, 1983), proposing a mechanism for parapsychological processes ranging from telepathy to so-called "materializations" based on recent data from the field of psychoneuroimmunology. I had a preview of these ideas when he sent me a lengthy critique of my 2002 article, "Stigmatic Phenomena: An Alleged Case in Brazil." Not only did Barber accept the probability that my research participant manifested stigmata, albeit from internal processes rather than from external "divine" intervention, but he proposed that the participant's alleged materialization of "apports" was not due to sleight-of-hand but reflected untapped potentials of the human organism. Wilson, his partner of many years, plans to show me his unfinished manuscript in the hopes that we can salvage some of the material for publication. If so, this will be a belated but potentially valuable gift to parapsychology. In a commentary published in *American Psychologist*, Barber (1996) criticized an article (Blumberg & Wasserman, 1995) that called for the abandoning of anthropomorphic reports. He stated, "When I trained as a psychologist more than 40 years ago, I learned that these and related percepts (which were then associated with Thorndike, Pavlov, Kantor, and Skinner) were useful in understanding behavior. During the past four decades, however, while continuously conducting intensive research in human psychology…and, more recently, in comparative psychology… I gradually realized with increasing certainly that [these] precepts are

misguided and hinder the progress of more than one area of psychology. In comparative psychology, these precepts block serious discussion and incorporation of the anomalous results yielded by a series of hard-headed projects conducted by behaviorally oriented investigators" (p. 58; also see Chaves & Barber, 1975). Because of Barber's openness to anomalous phenomena, he was one of the people to whom our book *Varieties of Anomalous Experience* (Cardeña, Lynn, & Krippner, 2000) was dedicated, a gesture that he enjoyed and appreciated.

References

References

Barber, T.X. (1970). *LSD, marihuana, yoga, and hypnosis*. Hawthorne, NY: Aldine.

Barber, T.X. (1976). *Pitfalls in human research: Ten pivotal points.* New York: Pergamon Press.

Barber, T.X. (1983). Changing "unchangeable" bodily processes by (hypnotic) suggestions: A new look at hypnosis, cognitions, imaginings, and the mind-body problem. In A.A. Sheikh (Ed.), *Imagination and healing* (pp. 69-127). Farmingdale, NY: Baywood Publishing.

Barber, T.X. (1993). *The human nature of birds: A scientific discovery with startling implications.* New York: Penguin Books.

Barber, T.X. (1994). Scientific evidence that birds are aware, intelligent, and astonishingly like humans: Implications and future research directions. *Humane Innovations and Alternatives, 8,* 672-676.

Barber, T.X. (1995). *Hypnosis: A scientific approach.* Northvale, NJ: J. Aronson. (Originally published 1959)

Barber, T.X. (1996). Restrictive versus open paradigms in comparative psychology. *American Psychologist, 51,* 58-59.

Barber, T.X. (1999). A comprehensive three-dimensional theory of hypnosis. In J. Kirsch, A. Capfons, E. Cardeña, & S. Amigo (Eds.), *Clinical hypnosis and self-regulation therapy: A cognitive-behavioral perspective* (pp. 3-48). Washington, DC: American Psychological Association.

Barber, T.X., & Calverley, D.S. (1964). An experimental study of "hypnotic" (auditory and visual) hallucinations. *Journal of Abnormal and Social Psychology, 6*, 13-20.

Barber, T.X., & Wilson, S.C. (1978/1979). The Barber Suggestibility Scale and the Creative Imagination Scale: Experimental and clinical applications. *American Journal of Clinical Hypnosis, 81,* 84-108.

Blumberg, M.S., & Wasserman, E.A. (1995). Animal mind and the argument from design. *American Psychologist, 50,* 133-144.

Cardeña, E., Lynn, S.J., & Krippner, S. (Eds.), *Varieties of anomalous experience: Examining the scientific evidence.* Washington, DC: American Psychological Association.

Chaves, J., & Barber, T.X. (1975). Acupuncture analgesia: A six-factor theory. In S. Krippner & D. Rubin (Eds.), *The energies of consciousness* (pp. 181-197). New York: Interface/Gordon & Breach.

Krippner, S. (Ed.). (1977). *Advances in parapsychological research* (Vol. 1). New York: Plenum Press.

Krippner, S. (1999). Discussion commentary: The varieties of hypnotic experience. *Contemporary Hypnosis, 16,* 157-159.

Krippner, S. (2002). Stigmatic phenomena: An alleged case in Brazil. *Journal of Scientific Exploration, 16,* 207-224.

Wilson, S.C., & Barber, T.X. (1978). The Creative Imagination Scale as a measure of hypnotic responsiveness: Applications to experimental and clinical hypnosis. *American Journal of Clinical Hypnosis, 20,* 235-249.

Wilson, S.C., & Barber, T.X. (1981). Vivid fantasy and hallucinatory abilities in the life histories of excellent hypnotic subjects ("somnambules"): Preliminary report with female subjects. In E. Klinger (Ed.), *Imagery: Concepts, results, and applications*. New York: Plenum Press.

Wilson, S.C., & Barber, T.X. (1983). The fantasy-prone personality: Implications for understanding imagery, hypnosis, and parapsychological phenomena. In A.A. Sheikh (Ed.), *Imagery: Current theory, research, and application* (pp. 340-387). New York: John Wiley.

T. X. BARBER'S TYPOLOGY'S IMPLICATIONS FOR PARAPSYCHOLOGY

Etzel Cardeña, PhD

Poul Thorsen Professor, Department of Psychology, University of Lund, Sweden

ABSTRACT

Theodore Xenophon Barber's initial contributions to hypnosis greatly increased the methodological and conceptual sophistication of the field (Barber, 1969/1995) and questioned a facile acceptance of unquestioned concepts such as "trance" and even "hypnosis" itself. Many people in the field still think, incorrectly, that he was foremost a critic of the reality of alterations of consciousness and extraordinary human potentials, whereas he was a careful and probing researcher and theoretician (see, for instance, Barber, 1976). In this presentation I want to emphasize his recent typology of highly hypnotizable individuals (fantasy prone, dissociative, highly motivated), with an emphasis on his construct of fantasy proneness and ways to measure it. Barber's typology (1999) extends the previous work of Deirdre Barrett (1990) and Etzel Cardeña (1996) and helps integrate separate strands in hypnosis research and theory. I will also discuss the implications that the consideration of different types of highly hypnotizables has for the empirical and conceptual study of parapsychological and other anomalous phenomena. For instance, the psychological dynamics of why a traumatized dissociator may be more psi-conducive (Ferenczi, 1993) may be different from those of someone who developed his/her inner life in a more benign way.

REFERENCES

Barber, T.X. (1976). *Advances in altered states of consciousness & human potentialities, volume 1.* New York: Psychological Dimensions.

Barber, T.X. (1995). *Hypnosis: A scientific approach.* Northvale, NJ: J. Aronson. (Originally published 1969)

Barber, T.X. (1999). A comprehensive three-dimensional theory of hypnosis. In J. Kirsch, A. Capafons, E. Cardeña, & S. Amigo (Eds.), *Clinical hypnosis and self-regulation therapy: A cognitive-behavioral perspective* (pp. 3-48). Washington, DC: American Psychological Association.

Barrett, D. (1990). Deep trance subjects: A schema of two distinct subgroups. In R. G. Kunzendorf (Ed.), *Mental imagery* (pp. 101-112). New York: Plenum Press.

Cardeña, E. (1996). "Just floating on the sky". A comparison of shamanic and hypnotic phenomenology. In R. Quekelbherge & D. Eigner (Eds.) 6th Jahrbuch für Transkulturelle Medizin und Psychotherapie (6th Yearbook of cross-cultural medicine and psychotherapy) (pp. 367-380). Berlin: Verlag für Wissenschaft und Bildung.

Ferenczi, S. (1933). Confusion of tongues between adults and the child. In E. Jones (Ed.) *First contributions to the problems & methods of psycho-analysis. Sandor Ferenczi, M. D.* London: The Hogarth Press.

Quekelbherge & Eigner, D. (Eds.) (1996). *6th Jahrbuch für Transkulturelle Medizin und Psychotherapie (6th Yearbook of cross-cultural medicine and psychotherapy*. Berlin: Verlag für Wissenschaft und Bildung.

IMPORTANCE OF SURVIVAL RESEARCH

Peter Mulacz[1], Erlendur Haraldsson[2], Etzel Cardeña[3], Stanley Krippner[4], Christine Simmonds[5], Suitbert Ertel[6]

[1]Austrian Society for Parapsychology
Vienna, Austria
[2]Department of Psychology, University of Iceland
Reykjavik, Iceland
[3]Department of Psychology, University of Lund
Lund, Sweden
[4]Saybrook Graduate School
San Francisco, CA, USA
[5]Department of Psychology, Liverpool Hope University
Liverpool, UK
[6]Psychology Department, Georg-August-University of Göttingen
Göttingen, Germany

ABSTRACT

Where do we come from – where do we go to? Questions like this one, or on the origin of the universe, or the evolution issue, or the meaning of all, have traditionally been addressed by religion and philosophy. Nowadays it is science that is asked such questions by society (of which the scientific community is a sub-set). Science owes society an answer and should meet such challenges and not leave the field either to the traditional religious or philosophical belief systems nor to pseudoscience; at least science should make clear whether or not a scientific answer on any such question is possible at all. In particular the issue of what happens to man after death – a question linked historically to psychical research and parapsychology from their very beginnings – is such question we should neither ridicule nor try to escape from, even if there are no definite answers. Thus, besides describing the problems in detail, the methodologies applied, and the achieved results of 'survival' research, the difficulties in tackling this issue should be explained, and un- or pseudoscientific approaches (many of the purporting to be scientific breakthroughs) should be exposed and refuted.

SUMMARY SHEET:

Panel title	Importance of Survival Research
Chairperson	Peter Mulacz
Panellists	Erlendur Haraldsson, Etzel Cardeña, Stanley Krippner, Christine Simmonds, Suitbert Ertel
Order of presentation	*Peter Mulacz:* Basic Issues
	Etzel Cardeña: Anomalous Identity Experiences: Mediumship, Spirit Possession, and Dissociative Identity Disorder
	Erlendur Haraldsson: Apparitions and CORT
	Suitbert Ertel: A Tentative Reinterpretation of Memories of a Previous Life
	Christine Simmonds: The importance of subjective experiences in survival research
	Stanley Krippner: Closing Remarks

BASIC ISSUES OF THE 'SURVIVAL' QUESTION

Peter Mulacz[1]
[1]*Austrian Society for Parapsychology,*
Vienna, Austria

ABSTRACT

There are many different concepts of 'survival after death'. Thus the first question in this panoramic overview is: what are we really talking about when discussing 'survival after death'? It is suggested to narrow this discussion on the (traditional) model of personal survival as opposed to other models such as merging in into a super-individual entity like a drop of water in the ocean, and many other variations of what might happen to us after death.

The 'top-down' approach to the survival problem – mediumistic enunciations, spontaneous cases, apparitions, hauntings, CORT, the Thouless cipher code, ITC/EVP, or other – has resulted in a centennial discussion between the positions of survival and 'super-psi' with no real progress. It has been shown (Mulacz 1976) that on pure logical grounds no compelling evidence for survival is possible by this kind of approach. Even more, as long as the underlying problem remains unsolved, all the ostensible evidence collected since more than hundred years remains but a colossus with feet of clay.

Thus, the question about the premise for 'survival' arises: who or what is supposed to survive? Traditionally, there is the notion of a kind of 'something' that is in existence already during physical life but is different from the physical body which disintegrates after death. Does such thing – regardless, how we name it (soul, mind, spirit, 'shin') – exist at all or is it just either a traditional belief or a posit based on wishful thinking? What properties do we ascribe to it? If the answer is: personal recollections that over one's lifetime have shaped the personality, the question arises which recollections – 'true' ones or such that are distorted by Alzheimer's disease or atherosclerotic dementia? Where else may memories be stored if not in the brain for which there exists overwhelming evidence?

All these open questions show that the very basis for approaching the survival problem is a likely solution to the mind-body-problem, in other words *philosophical anthropology*. It comes quite naturally that the solution is sought on the basis of a dualistic model: mind vs. matter whereby mind is thought to be non-physical. Thouless and Wiesner in their 'psi'-theory attempted a grand unification encompassing the mind-body-relation as well as the various paranormal phenomena which I consider to be still a very intriguing model, however, the underlying general problem how elements belonging to different categories (e. g. non-physical mind as opposed to the physical body) can act upon one another remains unsolved. Is there perhaps a third 'something', mediating between the physical and the non-physical (like the 'subtle body' of the occult tradition which is supposed to have mass that can be weighted) – a concept prone to further complicate things? One possible solution to this problem, which I suggest, is to abandon the category of 'influence' (i.e. causality, which in itself has its weakness as it is based on induction) and confine ourselves to establishing correlations – a shift in our frame of thinking.

Turning now to empirical research into the addressed issues, OBEE investigations are at the core of the problem. Recent research in NDEs has provided us with a wealth of case studies the interpretation of which remains disputed. It needs to be borne in mind that all narrations by OOBE experiencers originate from memory, not from actual experience, and are therefore prone to all kinds of distortions, even more, they may be mere (re-)constructions based on memories, as pointed out by Blackmore (Blackmore 1993) and others. Recently it has been shown (Woerle 2005) that even the much-praised Pam Reynolds case, hailed by some as a breakthrough, is not decisive and proves no conclusive evidence for the independence of 'mind' from the physical body.

Thus the conclusion is that the foundation on which the various phenomena of ostensible 'survival' – most ambiguous themselves – may be discussed is very weak indeed and that all reasoning on the significance of these phenomena must necessarily remain purely hypothetical.

References

Beloff, J. (1989). Dualism: A parapsychological perspective. In: J. R. Smythies & J. Beloff (Eds.) *The Case for Dualism.* Charlottesville, VA: University Press of Virginia.

Blackmore, S. (1993). *Dying to Live: Science and the Near Death Experience*. London: Grafton, and Buffalo, N.Y.: Prometheus Books.

Braude, S. E. (2003). Immortal Remains: The Evidence for Life after Death. Lanham, MD: Rowman & Littlefield.

Mulacz, W. P. (1976). Der sogenannte wissenschaftliche Spiritsmus als parapsychologisches Problem. In: O. Schatz (Ed.) *Parapsychologie. Ein Handbuch* (pp. 187-283). Graz/Wien/Köln: Styria.

Sommer, A. (2005). Im Niemandsland der Bewusstseinsforschung: Survival Research. Eine Übersicht. *Zeitschrift für Anomalistik, 5,* 178-237.

Thouless, R. H. & Wiesner, B. P. (1947). The psi process in normal and "paranormal" psychology. *ProcSPR, 48,* 117-196.

Woerlee, G. M. (2005). Mortal Minds: The Biology of Near Death Experiences. N.Y.: Prometheus Books.

ANOMALOUS IDENTITY EXPERIENCES: MEDIUMSHIP, SPIRIT POSSESSION, AND DISSOCIATIVE IDENTITY DISORDER

Etzel Cardeña[1]

[1]*Department of Psychology, University of Lund, Lund, Sweden*

ABSTRACT

The notion that each one of us represents a discrete, single, separate, and unified identity is, historically and culturally speaking, the exception rather than the norm. Alternatives to this view include the Buddhist perspective of a unified self as an illusion; the belief that human personality is porous to influences from spiritual forces (or, in more secular terms, to nonconscious forces); and Gurdjieff's notion that we have many selves that may only achieve integration through continuous self-observation and mindfulness. As we move from explanations to subjective experience, we also encounter myriad variations. Even the Western commonsensical view of a discrete, single identity allows for ‘clinical’ cases in which a single identity may nonetheless have an unaccountable lack of control over speech or the body. More theoretically challenging experiences include the ‘regular’ identity sharing consciousness with another identity or entity, or the alternation of distinct identities within a single body (which, if causing dysfunction, would qualify as dissociative identity disorder, erstwhile known as “multiple personality”). This paper categorizes and discusses various anomalous experiences of self, identity, and personality, emphasizing the similarities and differences among dissociative identity disorder, spirit possession, and mediumship. This presentation will focus on the phenomenology (i.e., “lived” experience) of these phenomena, including purported experiences of psi, as compared with the potential paranormal veridicality of the information obtained during these anomalous experiences.

APPARITIONS AND CASES OF THE REINCARNATION TYPE

Erlendur Haraldsson[1]
[1]*Department of Psychology, University of Iceland, Reykjavik, Iceland*

Abstract

Two new findings relevant for the survival question

For more than a century certain phenomena have been considered relevant for the question if some part of our being survives bodily death (Myers, 1903). Prominent among them are some features of apparitions of the dead, mediumistic communications, and – more recently – alleged memories of a previous life. Well-known is Stevenson's paper "The contribution of apparitions for the question of survival" in which he lists and discusses various features of apparitions that are particularly relevant for the survival question (Stevenson, 1982). Similar lists of could be made for mediumistic communications and "Cases of the Reincarnation Type" (CORT).

Do we have from recent years any new findings that can be interpreted as further arguments for survival? There is the counter-argument that any phenomena that we come across can be interpreted as not being evidence for survival, particularly by the super-psi hypothesis but let us put it aside for a moment.

I have come across two new findings that – in my opinion – extend the list of pro-survival arguments. One is from the realm of apparitions of the dead, the other from studies of children who claim memories of a past life. For neither finding do I find an easy natural explanation, and hence argue for their paranormality and relevance for the survival question.

Disproportionate frequency of appearances to strangers and relatives of persons who died violently

In Iceland, we have collected 450 detailed personal accounts of alleged contacts with the dead. Most of them are apparitional, and two-thirds with a visual component (Haraldsson, 1991, 2006). Among them 70,4% are of persons who had died naturally, and 29,6% violently (accident, murder or suicide). Only 7,86% of the population died violently in the relevant period compared to the 29,6% of the apparitional figures, which is almost fourfold. Similar findings have been observed before, but new is (as far as I know) that apparitions of a violent death were much more likely to appear to strangers than apparitions of persons who suffered a natural death, just as persons suffering violent death are more likely to appear in mediumistic communications, and are often found in as previous personalities in CORT.

Persons who suffer a violent death are two times more likely to appear to their relatives than persons who suffer a natural death. More interestingly, two-thirds of all apparitions of persons who suffer a violent death, appear to strangers, namely persons who did not know them when they were living. Thus, persons suffering violent death appear proportionally more often to their relatives than person who died naturally, but particularly often to strangers, who know nothing or near nothing about them and have no motivation to hallucinate them. These apparitional experiences have an invasional character.

Post-traumatic stress disorder in children who claim memories of a previous life

Children who claim memories of a past life do sometimes reveal knowledge of events that took place before they were born. There can be little doubt of the paranormality revealed in such cases, but they may be open to the super-psi interpretation. However, the super-psi interpretation runs into difficulties concerning birthmarks that are found in some cases and correspond to wounds that were inflicted on a

person who died before the child was born and has become identified as a previous personality because the child's statements fit the facts of the life events of that person.

In my psychological studies of children claiming past-life memories, a new finding has emerged. Psychological tests of Sri Lankan and Lebanese children reveal that as a group these children suffer from a post-traumatic stress disorder without ever having been in a life-threatening situation. Why? This can probably be best explained by the fact that 75-80% of the children describe how they died in the previous life through accidents, murder or other violent means. They repeatedly relive these images/memories. This is not an information transfer. It is a psychological, behavioural feature and thus of relevance for the survival question.

References

Haraldsson, E. (1991). *Apparitions of the dead: Analysis of a new collection of 350 reports.* In: E. Williams Cook & D. L. Delanoy: Proceedings of presented papers. Convention of the Parapsychological Association in Heidelberg. 205-220.

Haraldsson, E. (2006). *Látnir í heimi lifenda*. Reykjavik: Háskólaútgáfgan.

Myers, F. W. H. (1903). Human personality and its surival of bodily death. London: Longmans, Green and Co.

Stevenson, I. (1982). The contribution of apparitions for the question of survival. *Journal of the Society for Psychical Research*, 76(4), 341-358.

A TENTATIVE REINTERPRETATION OF MEMORIES OF A PREVIOUS LIFE.

Suitbert Ertel
Georg-Elias-Müller-Institut für Psychologie
Department of Biology
University of Goettinge

Abstract

When a young child claims to have lived a previous life, I. Stevenson considers the case as a “solved” rebirth case, if there is enough evidence that the previous person (PP) had existed. His interpretation of the child’s account by rebirth implies that some mental entity, often called “soul”, exists. After completing life in body PP the soul would resume, after some time of discarnate existence, a new life in body (S). Stevenson does not exclude other possible explanations. I suggest to also consider an explanation in terms of “imprinting”. PP mother’s memory-stored mental information about PP’s life experience (mainly the mother’s) might be transferred by her to some other woman’s embryo or fetus (S). The paranormal mechanisms might be telepathy (information transmission) and DMILS (direct mental influence on the child’s developing physical organism). My hypothesis took shape with an interview in Sri Lanka of two families of one rebirth case that Stevenson had already examined in 1982.

THE IMPORTANCE OF SUBJECTIVE EXPERIENCES IN EXPLORING THE SURVIVAL QUESTION

Christine A. Simmonds-Moore

Psychology Department
Liverpool Hope University,
UK.

ABSTRACT

This presentation explores survival related experiences from a qualitative perspective, with a particular focus on spontaneous and unexpected survival experiences, which may occur outside of their usual contexts. It is noted that transpersonal research methods (see Braud & Anderson 1998) may be adopted to employ open interviews and flexibility for inclusion of experiential elements within them (e.g., mediums and healers 'reading' or 'working on' ther interviewer) and allow for greater insight into the experience being investigated. Subjective paranormal phenomena may be explored through such interviews, which address survival-relevant experiences alongside other paranormal phenomena. This allows for understanding as to how various types of paranormal experience cluster together, as well as the characteristics of those who report such phenomena. It also allows for an expansion of our understanding of personality concepts such as boundary thinness (see Hartmann, 1991), for example, the way in which personality and survival relevant experiences have evolved across a life-time.

Interviews may be added into traditional laboratory research, e.g., as undertaken recently on a research project exploring healing (Palmer, Bauman, Simmonds & Drucker, 2005). It is noted that such mixed design approaches, incorporating proof, process and phenomenological elements to laboratory experiments have and will continue to develop a greater understanding of a wide variety of paranormal phenomena, including those relevant to the survival question. The author draws upon work undertaken with people reporting a range of psychic experiences; those working as psychic healers and those working as mediums. Traditional 'categories' of subjective paranormal experiences are often blurred and experiences suggestive of survival do seem to manifest outside of their "usual" context. For example, in the Palmer et al. (2005) healing study, it was found that healers working in a variety of traditions frequently described employing methods of channeling light alongside experiencing apparitions of deceased spiritual entities whilst executing their healing methodology. Likewise, one participant reported that she often experienced spontaneous mediumship phenomena whilst working on her clients. Often, the healer did not initially understand who the apparition was, and later realized the apparition was associated with a deceased person. In recent interviews with mediums, it was also found that healing experiences or training were not uncommon in their life histories. The author also describes future work, whereby varieties of psychokinetic experiences, in particular those apparently related to survival (e.g., see Alvarado, 2006) will be explored qualitatively.

REFERENCES

Alvarado, C.S. (2005). Neglected near death phenomena. *Journal of Near Death Studies, 24(*3), 131-151.

Braud, W., & Anderson, R. (1998). *Transpersonal research methods for the social sciences: Honoring human experience*. Thousand Oaks, CA: Sage.

Hartmann, E. (1991). *Boundaries in the mind: A new psychology of personality*. New York: BasicBooks

Palmer, J., Baumann, S., Simmonds, C. & Drucker, S. (2005). Factors affecting the relationship between human intentionality and the hemolysis of red blood cells. In *Proceedings of Presented Papers from the 48th Annual Convention of the Parapsychological Association*, 119-131.