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# PARAPSYCHOLOGICAL ASSOCIATION

2005 PRESIDENTIAL ADDRESS: Parapsychology'sContribution to Psychology: A View from theFront LineCaroline Watt

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# PARAPSYCHOLOGY'S CONTRIBUTION TO PSYCHOLOGY: A VIEW FROM THE FRONT LINE<sup>1</sup>

#### BY CAROLINE WATT

ABSTRACT: Parapsychology can build bridges to many different scientific disciplines. Demonstrating that it can make valuable contributions to mainstream science will help establish parapsychology's relevance and credibility. Taking psychology as an example, the article gives cases from parapsychology's past and present in which the study of apparent anomalous communication or influence may lead to developments that are of mainstream benefit. First, at a time when experimental psychology was beginning to focus on measuring simple perceptual, cognitive, and motor functions, early psychical researchers helped develop ideas of the mind in psychology. Second, the methodological challenges facing those investigating paranormal claims have led to important developments, such as the use of blind methods that have become widely adopted by the mainstream. Constructive engagement with critics can help identify methodological improvements that have the potential to benefit parapsychology as well as other mainstream areas that are dealing with similar problems such as difficult-to-replicate effects. Last, to build a more persuasive case for psi, parapsychologists need to work together to systematically investigate promising methodologies rather than hopping from one method to another. Preregistering studies as pivotal or exploratory would help to avoid the current problem of controversy over interpretation of meta-analyses conducted with knowledge of study results.

Many of us have happy memories of the 2004 PA Convention in Vienna, where Bob Morris was his usual sociable self. No one could have guessed then, as Nancy Zingrone handed over the Presidency to me, that Bob would tragically die less than a week after the convention ended and exactly a year ago from the date of this address, August 12. I never imagined that he would not be sitting proudly in the audience as I gave my first Presidential Address.

It is a tribute to Bob Morris's leadership that parapsychology will continue to be integrated into the psychology department at Edinburgh. I think that one of the reasons that Morris was so successful was that he was particularly good at seeing the contribution that parapsychology could make to many different areas, such as medicine, physics, and philosophy. I'm going to speak to that theme in this address, focusing on what parapsychology has to offer psychology. I will draw on examples from our

<sup>&</sup>lt;sup>1</sup> This article is a revised version of the presidential address for the 48th Annual Convention of the Parapsychological Association, held at the Institute of Noetic Sciences, California, August 11-15, 2005. I would like to thank Carlos Alvarado, Chuck Lear, and Richard Wiseman for their helpful comments on this address.

past and our present, and from my own experience in the "front line" working as a parapsychologist within a psychology department at a leading UK university. Along the way I will also touch on what I think are some of the weaknesses of our field, and I will suggest how we can become stronger.

# MENTAL PHENOMENA AND ANOMALOUS EXPERIENCES

My first theme is that psychical research and parapsychology have an important role to play in keeping mental phenomena and anomalous experiences on the mainstream research agenda. By "mental phenomena" I mean considerations of consciousness and volition as well as allegedly paranormal phenomena such as extrasensory perception (ESP) and the influence of mind over matter. The history of psychology and parapsychology—or psychical research as it was then known—is closely intertwined. The two shared common areas of interest and common problems and couldn't easily be distinguished from one another. In tackling these problems, frequently it was the psychical researchers who were the pioneers.

Experimental psychology began with the founding of Wilhelm Wundt's psychology laboratory in Leipzig in 1879. The emphasis was on understanding people's perceptual, cognitive, and motor functions, using statistical analysis of experimental data. Both in the US and on the European rontinent, many early experimental psychologists worked within a scientific vorldview that nature was understandable through careful observation and discovery of mechanistic laws. In Britain, however, a dissident group of thinkers felt that the prevailing mechanistic model had wrongly demoted the role of *mind* in nature. Historians such as Oppenheim (1985) and Plas (2000) have argued that this group exerted a strong influence on the development of psychology.

Frederick Myers, Henry Sidgwick, and Edmund Gurney were prominent and respectable academic figures who attempted to apply scientific method to the study of a wide variety of mental phenomena. For example, they studied the survival of human personality after death, anomalous phenomena associated with mesmerism, and the strange physical manifestations reported to occur during séances with spiritualist mediums. These phenomena are today associated with parapsychology but the earliest researchers considered these topics to have a rightful place in mainstream psychology (Oppenheim, 1985). This group of thinkers challenged the reductionistic and mechanistic agenda that was taking hold in psychology.

As a concrete example, let us consider the Second International Congress of Experimental Psychology. This was held in London in 1892, ten years after the founding of the Society for Psychical Research (SPR). The President of the Congress was also the President of the SPR, Henry Sidgwick. The majority of the English members attending the congress were either SPR members or were openly sympathetic to its aims (Sidgwick & Myers, 1892). In his opening address, "The Future of Psychology," the eminent Parisian physiologist Charles Richet gave an important place to *psychologie transcendentale*, by which he meant the study of those mental phenomena of particular interest to psychical researchers. Presenters at the Congress included Henry Sidgwick on apparitional experiences, Myers on hallucinations, and Eleanor Sidgwick on experiments in thought transference. At that time the distinction between "normal" and "paranormal" was quite blurred. Psychical researchers tackled questions such as the mechanisms and phenomena of hypnosis that were unknown to psychology too.

Several historians have persuasively demonstrated the influence of psychical researchers on the development of concepts in what would become mainstream psychology. Gurney and Mycrs's studies of hypnosis and mediums assisted in establishing the concepts of dissociation and the subconscious mind (Alvarado, 2002, 2004; Kelly, 2001). And in his work *The Discovery of the Unconscious*, Ellenberger (1970) argued that interest in psi phenomena and spiritism were influential in developing ideas of the mind in psychology (see also Alvarado, 2003a).

Carlos Alvarado has published a number of papers that bring parapsychology's contribution in these areas to the attention of mainstream scientists. His publications in the American Journal of Psychiatry (Kelly & Alvarado, 2005), the Journal of Trauma & Dissociation (Alvarado, 2002), and American Psychologist (Alvarado, 1987) explicitly point out the contribution of psychical research to the development of concepts in psychology and psychiatry. This is an important strategy into which parapsychologists need to put more effort. Encouraging our mainstream colleagues to be aware of our contribution to their disciplines makes it more difficult for them to dismiss parapsychology as an irrelevant or fringe area.

From these intertwined beginnings, then, perhaps the first way in which parapsychology contributed to psychology was to challenge the restricted agenda of early experimental psychology, and to advocate tackling difficult concepts such as free will, consciousness, and mind-matter interactions.

As Emily Kelly put it, "If psychical research does nothing more than continually shake complacent assumptions about fundamental questions concerning mind, consciousness, volition, that alone is a significant contribution to science" (Kelly, 2001, p. 86).

In more recent times, there has been an upsurge of interest in consciousness and parapsychology, as Dean Radin showed in his book *The Conscious Universe.* Radin (1997) gave the results of a survey of books published with *consciousness* in their titles between 1800 and 1990. Fifty percent of all books published on this subject have appeared since the 1980s. Similarly, interest in parapsychology has grown dramatically in the last few decades. More than 50% of all books with *parapsychology* in their

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titles have appeared since the 1970s. There has been a general increase in the number of books published, but the growth in a comparable area such as psychology is much less dramatic. These figures suggest that publishers are happy to commission books on consciousness and parapsychology, and that the public has a great interest in these topics. These should be fertile times for parapsychologists because people want to hear what we have to say.

Nowadays there again seems to be a tendency for psychology to move toward a reductionist approach. From the front line, I can see this trend in UK psychology. It's almost as if history is repeating itself. Subjects such as psycholinguistics and cognitive neuroscience are thrivingwhat might be called "single head psychology," in which the focus is on relatively simple cognitive processes that are going on within the head of one individual. In contrast, social psychology, with its focus on complex interpersonal interactions, seems to be winning less support and to have lower status. Modern parapsychologists, like their nineteenth-century forefathers, can help to balance this trend by reminding psychologists of the wider aspects of human experience that are often neglected but that are necessary to gain a full understanding of psychology's subject matter. Surveys show that a sizeable percentage of individuals report paranormal experiences and beliefs. This is no fringe area of human experience-it's quite central. It is incumbent on researchers to investigate and understand these experiences and beliefs, and parapsychology has a very important role to play here.

Perhaps in reaction to this apparent reductionist trend, an increasing number of modern psychologists are arguing that psychology is incomplete if it does not include the full range of human experiences, including anomalous experiences (e.g., Cardeña, Lynn, & Krippner, 2000). In addition to the question of psi—and I'm going to be saying more about psi later—there are a wide variety of anomalous human experiences, such as near-death experiences (NDEs) and out-of-body experiences (OBEs), that have long been of interest to parapsychologists and that can make an important contribution to psychology.

One recent example is provided by English researcher Craig Murray, who has presented at the PA and SPR conferences. Murray's work is on OBE and body-image, and his research in this area has been published in reputable mainstream forums such as the *Journal of Nervous and Mental Disease* (Murray & Fox, 2005a) and the *British Journal of Psychology* (Murray & Fox, 2005b). Murray has found differences in OBE experients and nonexperients in terms of body image. Compared to nonexperients, experients were more dissatisfied with their bodies, reported more socialphysique anxiety, and scored lower on physical self-presentation. The results suggest a social dimension to OBE experiences. This is an important contribution to the psychological literature on OBEs, which previously has focused on perceptual dissociation interpretations of OBEs. Another young researcher, Anneli Goulding, has recently gained her PhD from the University of Gothenburg. Her thesis was on mental health aspects of paranormal and psi-related experiences, focusing on the concept of healthy schizotypy. Goulding already has two publications based on her thesis work in the mainstream journal *Personality and Individual Differences* (Goulding, 2004; Goulding, 2005). Her work is important because it challenges the frequent assumption that paranormal experiences are necessarily pathological.

Another recent development is the appointment of Etzel Cardeña to the new Chair of Parapsychology at Lund University in Sweden. This has the potential to benefit parapsychology by showing how the study of spontaneous paranormal and anomalous experiences can contribute to developments in the psychological mainstream and by raising the profile of parapsychology and the psychology of anomalous experiences within influential institutions such as the American Psychological Association (APA). I am impressed that the APA has published a book on *The Variety* of Anomalous Experiences (Cardeña, Lynn, & Krippner, 2000), and I think this is good news for parapsychology. The book's coeditor, Stan Krippner, has told me that their volume is a best seller for the APA and has already been reprinted several times. The book includes chapters on OBEs, NDEs, alien abduction experiences, past-life experiences, and spontaneous psi experiences, and it is really exciting to have such topics brought to the attention of a wide mainstream audience.

#### CRITICS

My second theme is critics. Armchair critics, who have a kneejerk reaction to the idea of psi and who publicly criticise parapsychology without being informed of the experimental literature, are not worthy of our attention. The kinds of critics I want to talk about are those who challenge the evidence in favour of psi, and that means internal critics as well as informed critics outside of our field. I think there is sometimes a tendency to demonise these individuals and to use them as scapegoats—not the original usage of the term *goat* in a parapsychological context!

My experience of being the sole parapsychologist presenting at a couple of skeptical congresses is that actually parapsychologists and their critics have a great deal to agree about. They are both trying to find out whether there is evidence to support the psi hypothesis.

That is what Ray Hyman and Charles Honorton found with reference to the ganzfeld ESP studies. They had each separately published meta-analyses of the ganzeld studies that came to different conclusions. Hyman found over half of the studies he reviewed to have significant results (Hyman, 1985) but argued that there were methodological and statistical flaws present that might account for these results. Honorton's (1985) metaanalysis found similar psi results to Hyman's, but he argued that these results could not be accounted for by Hyman's flaws. The two could have gone on with a protracted exchange of written articles and rebuttals, and in fact these were already in preparation. However, they met at the 1986 PA Convention in Sonoma, California, and had a conversation over lunch (Hyman & Honorton, 1986).

As Hyman and Honorton describe it, "During the discussion we realized that each of us had not fully and accurately understood the other's position on some of the major issues dividing us" (Hyman & Honorton, 1986, p. 351). They went on to conclude:

Parapsychologists and their critics share many common objectives. *These commonalities rarely are noticed in the debates, which focus on the differences.* Yet such commonalities hold the key for how the parapsychologist and the critic can join forces to achieve the ends to which they both aspire. (p. 363, my italics)

Most critics are as keen as parapsychologists to see good quality psi research. Hardly any of the papers presented at the skeptical conventions that I've attended have been attacking parapsychology. Rather, they have been critical of a broad range of pseudoscientific practices, such as the teaching of creationism in schools in a way that doesn't encourage critical thinking, and alleged psychic surgery being practised through sleight of hand. These are practices of which many parapsychologists would also be critical. Perhaps it is a measure of our success as scientists that the sceptical community today gives relatively *little* attention to parapsychology.

We need to look to our own body of researchers and communicators to do a professional job of rebutting criticisms that appear both in scientific and popular forums. As Bob Morris has argued, we could be far more effective at presenting our research findings to the media and to the scientific community (Morris, 2000). It is a task that requires great skill, but we need to find a way to make our findings relevant to the public and to science journalists, and to communicate our research clearly and in an engaging way.

In fact, I would go a step further and say not only that we have much the same aims as critics—to find the answer to questions about the paranormal—but that we *need* critics. Where would we be without being open to a wide variety of viewpoints about psi? What if Ray Hyman and Charles Honorton hadn't had that face-to-face conversation at the PA?

This brings me back to the main theme of my paper—how parapsychology can contribute to psychology. One way we can contribute is through the evolution of improved research methods that, although developed in response to a parapsychological problem, later spread to the mainstream. I'm going to be giving some concrete examples of this later. Critical scrutiny can assist in making these methodological developments, and that is one reason why we need critics. The conversation between Charles Honorton and Ray Hyman led to improved procedures in the ganzfeld and ultimately to the publication in a leading psychology journal of a landmark paper demonstrating evidence for psi (Bem & Honorton, 1994).

If we don't have a variety of points of view represented, then our gatherings and our journals become more akin to religious than to scientific forums. I for one don't want to be a member of the church of parapsychology.

I know some parapsychologists agree with me—Marilyn Schlitz, for instance, made similar arguments in her presidential address at the Freiburg PA in 2000 (Schlitz, 2001). And of course Bob Morris always laid a great emphasis on the importance of communicating with critics, of understanding the psychology of magic and deception, and of studying what he called "what's not psychic but looks like it." The pseudo-psi hypothesis needs to be investigated in order to facilitate progress with the genuine psi hypothesis. Morris understood the practical and rhetorical value of taking what he called the "counter-advocate" position on board, and he always led off his talks with this point. Furthermore, those of us who have been on the receiving end of Morris's questions at conferences, and of his reviews of our papers, will know how good he was at ferreting out weaknesses in research. We need to identify these weaknesses, and informed critics can help us do this.

#### Psi

Parapsychology involves the study of anomalous experiences, such as OBEs, that may be primarily due to quite normal psychological processes, as well as the study of what we might call the "core phenomena" of parapsychology—phenomena such as ESP, PK, and DMILS, which may suggest the operation of processes that are beyond what science and psychology currently understand. Clearly it is the existence of psi that is central to the concerns of many parapsychologists, and that is most revolutionary in its implications for psychology and for science more widely. If psi genuinely exists, this means psychology's understanding is far from complete. People may influence and interact with one another in ways that psychologists do not currently recognise. And of course the ramifications go way beyond psychology.

Despite some compelling landmark papers supporting the psi hypothesis, such as Bem and Honorton's ganzfeld meta-analysis (Bem & Honorton, 1994), I feel we have yet to provide evidence that persuades the scientific community beyond parapsychologists themselves. If we take the ganzfeld as an example, there are so many questions still to be answered. Is white noise better than pink? Would the sound of waves or drumming also work? Does ganzfeld stimulation really induce an altered state of consciousness, and if so, what state is it? Do participants need to wear eye shields or would closed eyelids work just as well? Is a prior relaxation exercise necessary? Can we have musical targets? What are the characteristics of a "standard" ganzfeld? What is the role of the sender in the ganzfeld? Does making a simultaneous verbal mentation report disrupt the participant's altered state, and how does this compare to having participants keep quiet and recall their mentation later? If we go to such lengths to immerse ganzfeld participants in a sensorially homogeneous environment, why is this not necessary for other ESP methods such as remote viewing? We have so much to learn about what specific features of the ganzfeld technique are psi-conducive, and why.

Parapsychologists need to be *far* more systematic in how they tackle these questions. Bemand Honorton's (1994) meta-analysis reported internal patterning that could give us important information on the psi process. But few of the more recent studies report on whether their participants were novices, what their extraversion and paranormal belief scores were, and whether they matched the warm social ambiance created in Honorton's studies (Milton & Wiseman, 1999). Systematic follow-up is an essential prerequisite for demonstrating a replicable effect. As a rough count, this year's PA conference has about 3 papers on the ganzfeld out of a total of 30 papers—only 10%. More of us need to focus on our leading methodologies, and we need to be cautious about introducing innovative variations to these methods. Innovation is not a bad thing, of course, but it is something that needs to grow from a solid foundation, and I think we need a more solid understanding of the factors that may facilitate psi in the ganzfeld.

We need to find the "recipe" for demonstrating psi in our experiments, and we can't do this by hopping from one methodology to another—something I'm afraid we have a tendency to do. For example, the landmark 1987 *Behavioural and Brain Sciences* paper by Ramakrishna Rao and John Palmer cited the differential effect—the tendency of individual participants to score differentially in successive ESP tests when these have two contrasting conditions—as one of the three major areas of psi research demonstrating a replicable effect (Rao & Palmer, 1987). But where are the studies of the differential effect now? My guess is that some younger parapsychologists won't even have heard of the differential effect.

Yes, exploratory studies are important. But it will be difficult to provide replicable evidence for psi without having a clear understanding of the conditions needed for its occurrence, and without systematically following up on our most promising lines of research. You don't need me to tell you that in terms of numbers we are a *tiny* field compared to other disciplines. Sybo Schouten (1993) once estimated that the total human and financial resources devoted to parapsychology since 1882 were equivalent to the resources devoted to less than *two months* of research in mainstream psychology in the United States. Furthermore, many of us have few resources to conduct research. But that makes it even more important that we focus our limited resources on key questions and methodologies in parapsychology.

Some of the ramifications of the existence of psi are unwelcome to science. For instance, experimenters' attempts to remove themselves entirely from the system under study would seem to be doomed to failure. In classical physics and chemistry, there was never any consideration that the person doing the measuring might be affecting the measurements themselves. Psychology has sought scientific respectability by following the same kinds of experimental methods as the hard sciences—attempting to measure and observe the samples under study. But psychologists have found that it's not so straightforward when their "samples" are human participants. Even without the problem of psi, the elements in the experimental system are already overlapping to some extent in psychological studies, as demonstrated in Rosenthal's landmark work on expectancy effects (Rosenthal, 1976) and self-fulfilling prophecies.

The participants in psychological studies are thinking beings. They are thinking about the role they are playing and what the experimenter might expect them to do, and they are consciously and unconsciously responding to cues from the experimenter, and vice versa.

This is a place where parapsychology can lead the way for psychology. Parapsychology has the potential to extend our understanding of research with complex and overlapping systems. We can develop strategies to tackle such complexities. Not only do we deal with human participants, but we also take seriously the possibility of psi, which may further dissolve the apparent boundaries between individuals involved in a research project. We are grappling with the problem of experimenter effects, and we know that a large number of different factors may play a role in these effects, including experimenter psi. We can suggest ways to lessen the influence of the experimenter in our research, such as having a person otherwise uninvolved in the research do the target randomisation, or having the participant initiate the computer program to start a session (Stanford, 1981).

We also can lead the way by taking into account the experimenter, as is already being done to some extent. It is not unusual in the methodology section of parapsychology articles to include a description of the experimenters—for example, their age, sex, and beliefs about psi. This could be extended in the future to include details of the experimenters' personality, or whatever other factors we find interact in important ways with the experimental system. This is a practice that psychology could benefit from taking up in the future.

However, we shouldn't allow our "physics envy" (Watt, 1996) to blind us to the possibility that the traditional methods might *not* be best suited for psi research. At the very least, traditional methods may need to be complemented by techniques that recognise the role of the investigator and the reflexive nature of research, particularly with human participants. For example, Rhea White (1997a, 1997b), Marilyn Schlitz (Locke & Schlitz, 1983; Schlitz, 1987), and William Braud (Braud & Anderson, 1998), are recognising the limitations of the traditional experimental method for research into psi and exceptional human experiences. Some of these complementary techniques, such as transpersonal and ethnographic approaches and the study of narrative and discourse, may be advocated as ways to develop a deeper understanding of the phenomena and experiences with which parapsychologists are concerned. Parapsychologists may have a future role to play in reminding psychologists of the limitations of their research methods and in suggesting strategies to help overcome these limitations. These methods are not unknown to psychology, of course, but parapsychology may provide a fruitful and informative case study for psychology. To some extent parapsychology's problems resemble those of psychology but are more extreme and therefore are more demanding of methodological solutions.

# METHODOLOGICAL ADVANCES

The activities of the founding fathers of psychical research were influential in developing concepts of the mind in psychology. But parapsychology's contribution goes beyond this. There are many examples of how the subject matter of parapsychology—claims of anomalous information transfer or influence—has demanded, and produced, methodological advances. These methodological advances have then spread from the fringe to the mainstream, and this is the final theme that I want to speak to.

Although blind methods had first been used to test mesmerists' claims in the late eighteenth century (Kaptchuk, 1998), their use did not spread to the mainstream at that time. Historians such as Ian Hacking and Ted Kaptchuk have argued that in fact the origins of blind methodology in psychology can be traced to psychical research (Hacking, 1988; Kaptchuk, 1998). As early as 1884, Charles Richet was conducting card-guessing experiments. He used a screen to separate the participant who was attempting to guess the card's identity from the person who was looking at the card and trying to communicate its identity telepathically.

Although Charles Peirce and Joseph Jastrow are widely credited with introducing blind methods to psychology in their pioneering experiments in psychophysics, there is in fact an earlier link to psychical research. As founding members of the American Society for Psychical Research, Peirce and Jastrow were well aware of Richet's use of blind methods in card guessing, which predated their own use of blind methods by a couple of years. So it has been argued that the introduction of blind methods in psychology can be traced back from ensuring accurate observation in mainstream psychophysics to testing claims of thought transference (Hacking, 1988; Kaptchuk, 1998).

Parapsychologists have always been faced with a particular problem: there is as yet no known mechanism for psi abilities. It would be an exaggeration to say that there are *no* theories—there are *many* theories of psi (e.g., Stokes, 1987). However, no theory has been widely accepted by parapsychologists, and many conduct their research without explicit reference to any theoretical framework. This rather impoverished theoretical context has forced parapsychologists right from the outset to ask often completely *empirical* questions, such as, "Can a person correctly guess the identity of a concealed card more often than would be expected by chance?"

Historians have argued that the origins of the use of randomisation in experimental design can be traced to the early card-guessing experiments of the SPR (Hacking, 1988; Kaptchuk, 1998). Richet suggested that if psychic ability were weakly present in the general population, then if a number of people were tested with long sequences of *randomly drawn* playing cards, a greater than expected number of successful guesses would indicate psychic ability. Probability modeling *was* used in psychophysics at that time, but not for drawing inferences. Richet's work was a pioneering application of randomization.

But it took until the 1930s, with the work of Fisher, for randomisation and statistical inference to become adopted by mainstream psychologists. Normally students of psychology are taught that Fisher developed his methods for randomisation and statistical inference from his work on agricultural field trials. However, a decade before his landmark publication on the design of experiments, Fisher published methods of dealing with the problem of statistical inference in card guessing (Fisher, 1924). Fisher was intimately aware of the empirical questions that parapsychologists were dealing with, and he helped to develop methods to tackle these questions. Clearly the emergence of randomisation for statistical inference was in part stimulated by challenges facing parapsychologists.

My examples so far have come from the early days of psychology and psychical research. However, the fact that parapsychologists seem to be dealing with a difficult-to-replicate effect has more recently stimulated methodological growth. I think it is fair to claim that parapsychologists were ahead of the game, compared to psychologists, in using meta-analysis to assess the outcomes of groups of studies.

When trying to assess the replicability of our findings, parapsychologists were quick to realise the limitations of p values and the utility of uniform effect-size indicators for statistically comparing groups of studies. Even back in 1986, Robert Rosenthal, in his commentary on the ganzfeld debate, noted that it did a service to science in general by raising many important issues about meta-analysis and the nature of replication (Rosenthal, 1986).

Meta-analysis is not a panacea, and parapsychology provides an excellent test case for meta-analysis. The fact that different analysts working on the same body of studies can come up with contrasting conclusions points to ways in which meta-analysis can be improved, for instance by using multiple independent and blind coders (Steinkamp, 1998). Also, it is clear that in a small field like parapsychology, it is not possible to set the coding criteria for meta-analysis blind to the outcome of studies.

If we carry on as at present, there will be no end to the arguments over the outcomes of meta-analyses in parapsychology. The criteria for inclusion and for coding need to be set in advance of the studies actually being done (Akers, 1985; Kennedy, 2004; Milton, 1999) rather than as happens at present, with the benefit of hindsight. Jim Kennedy's Proposal and Challenge for Proponents and Skeptics of Psi, published in the Spring 2004 Journal of Parapsychology, perhaps goes furthest to recognise this problem and to suggest a solution (Kennedy, 2004). Drawing on his experiences in pharmaceutical research, Kennedy recommends that proposed pivotal studies be identified and planned in advance. A committee of experienced parapsychologists, moderate skeptics, and a statistician could review and comment on the proposed protocols so that methodological issues would be dealt with before the data are collected. Exploratory studies would continue, of course, but would be so designated in advance of the results being known, and excluded in advance from future proof-oriented metaanalyses.

Although Kennedy's proposal is the most recent of its kind, it is certainly not the first. For example, in the joint communiqué on psi ganzfeld research that Ray Hyman and Charles Honorton published almost 20 years ago (Hyman & Honorton, 1986), they stated:

> Many of the problems we encountered in evaluating the ganzfeld psi experiments could be avoided in future experiments if the reviewers could be sure that they were dealing with the entire population of relevant studies and could insure the internal validity of these studies. Ideally, the best way to achieve this would be to sponsor a systematic replication series under the auspices of a neutral agency such as the National Science Foundation. (p. 363)

And they go on to outline a scheme involving parapsychologists and knowledgeable critics much like that suggested by Kennedy.

Similar problems are likely to be experienced in areas of psychology that are also dealing with weak, unreliable, or controversial effects. The repeatability problems faced by parapsychology and the strategies we develop to overcome them could help mainstream psychology too.

Parapsychology also has much to offer psychology in the study of deception and self-deception, as argued by Irwin Child (1984). Bob Morris recognised the importance of developing expertise in this area. It was not unusual in his public talks for him to spend so long discussing "what's not psychic but looks like it" that he ran out of time before getting to the "genuine psi" part. Some have argued that Morris's success in establishing parapsychology in UK universities was to some extent due to his demonstrable awareness of the pitfalls in behavioural research as well as in parapsychology (Alvarado, 2003b).

From my own point of view on the front line, British academics spend much of their time working to gain credit in the Research Assessment Exercise (RAE). This is a system of judging the quality of the research output of university staff, primarily based on the international status of the journals in which they publish. The higher the rating, the more funding the department is awarded from the government. Members of staff are judged on their four "best" publications.

So, one indicator of the contribution of parapsychology within my university is to look at the role Koestler Unit researchers played in the last RAE, which was in 2001. There were 20 psychology department staff "returned" in the 2001 RAE. Four of these, that's 20% of the entire psychology return, were parapsychologists—myself, Fiona Steinkamp, Paul Stevens, and Bob Morris. The RAE rating that our department won increased dramatically. I think this was one of Morris's greatest achievements as Koestler Professor because it showed a true integration of parapsychology within the academic life of the university and made a genuinely positive contribution to the national and international standing of the department. Many of our RAE publications were on psi research and were published in specialist publications, such as the *Journal of Parapsychology*.

Aside from the scrutiny some of us enjoy—or endure—as part of bureaucratic procedures like the Research Assessment Exercise, we cannot expect mainstream scientists to seek out our research in specialist parapsychology journals. Therefore, we should not complain if we feel that our research is being ignored. While we must continue to support our journals with technical research reports, we should also work hard to represent our work in more mainstream publications. There are several examples, particularly of meta-analytic reviews of psi research, that *have* won publication in some of the best quality psychology journals (Bem & Honorton, 1994; Bōsch, Steinkamp, & Boller, 2006; Milton & Wiseman, 1999; Schmidt, Schneider, Utts, & Walach, 2004)

Publishing our research in quality mainstream journals will help to establish the academic credentials of parapsychology, and an ability to publish in the mainstream will demonstrate to a wide audience the methodological quality and theoretical relevance of our research. If we can pull our weight with the "big boys," we will be noticed and taken seriously.

Parapsychologists can be proud of the methodological quality of their research. We are aware of the need to provide compelling evidence to support the extraordinary claims we are making, and we do our utmost to rule out artifacts in our research. From my position on the front line, this is something that I know is greatly appreciated by my psychologist peers. I believe that the quality of parapsychologists' methodology is as good as, and often *better than*, that of psychologists. Undergraduate psychology students who attend Edinburgh's courses on parapsychology have often commented to me that they have learned a tremendous amount about scientific methodology in these courses.

#### CONCLUSIONS

To sum up, I have argued that parapsychology has an important contribution to make to psychology in the present and future, as it has done in the past. From my position on the front line, I feel valued by my psychologist colleagues and proud of parapsychology's past achievements and future potential.

In the past, psychical researchers encouraged psychology to pay attention to difficult-to-study concepts such as the unconscious mind. We have seen how statistical developments in randomisation and the use of probability testing to make inferences were stimulated by challenges facing early parapsychologists. Developments in the use of blind methods also originated in response to such challenges, in an attempt to rule out potential sensory leakage artifacts.

In the present, we are investigating topics of interest to psychologists, such as anomalous experiences, experimenter effects, and the psychology of deception and self-deception. Parapsychology's experimental literature also provides a thorough test for statistical tools such as meta-analysis and can stimulate improvements in the use of such tools. Psi itself has an obvious impact on psychology and beyond, but I don't think we can expect other academics to share our interest in psi until we can persuasively demonstrate to them that we have a replicable effect. To do this we need to be far more systematic in our approach and not hop about from one methodology to another.

In the future, I hope that we can increase our profile in the mainstream. But we cannot do this by being a defensive organisation. We *can* do this by being aware of the strengths of our scientific discipline. We can bring to the attention of the mainstream the many contributions that parapsychology has made in the past, is making in the present, and can make in the future. By having the ability to publish in mainstream journals, we can demonstrate to our more skeptical peers the quality of our methodology and the practical and theoretical importance of our subject.

We are fortunate that our subject excites and attracts young investigators. We should do our utmost to support and encourage them in a responsible way. We are a small community facing a big task. But by being rigorous and systematic in our efforts and professional in our communications with the media and other scientists, we *will* make progress.

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# SOLAR-PERIODIC FULL MOON EFFECT IN THE FOURMILAB RETROPSYCHOKINESIS PROJECT EXPERIMENT DATA: AN EXPLORATORY STUDY

# BY ECKHARD ETZOLD

ABSTRACT: Radin and Rebman (1998) claimed evidence of psychokinesis effects in casino payout rates depending on lunar phases. They found the peak effect in the full-moon interval. This paper reports on an experimental data evaluation of 199,632 retroPK experiment trials, covering eight years. The hypothesis of a full moon effect is tested with the large database of the Fourmilab RetroPsychoKinesis Project. An earlier test of these findings by the author, published in 2000, supported the full moon hypothesis. In additional tests with new data, published in 2002, the observed effect changed its sign and disappeared. Some researchers, including the author, suggested in the past an anomalous experimenter effect and assumed the consequences of the model of pragmatic information to be the real cause of these effects.<sup>1</sup> But a new evaluation of the data revealed a significant retroPK solar-periodic relationship which indicates that actually physical parameters are responsible for the change of the full-moon effect in the mentioned intervals. The hypothesis is suggested that the moon's interaction with earth's magnetosphere during the moon's passage through the magnetotail in full-moon times might modulate retroPK performance.

The lore about the moon's effect on the animal and human behavior has existed for centuries. The full moon seems to be connected with a higher accident rate. The notions of "full moon madness," "lunacy," and "lunatic" imply a relationship of altered states of consciousness with lunar influences. The tales of werewolves and moon magic bring the moon into connection with anomalous phenomena. In the Holy Bible, people pray to the Lord that the moon shall not "smite you by night" (Ps. 121:6, Revised Standard Version). The full moon is also associated with important spiritual events: Passover and Easter are always at Saturday and Sunday after the full moon of the vernal equinox. The time of a solar and lunar eclipse is considered to be a time of extreme spiritual importance and of successful prayer: "The *sun shall be turned to darkness*, and the *moon to blood*,

<sup>&</sup>lt;sup>1</sup> This was also mentioned in the first submitted draft of this paper. But an anonymous reviewer commented on the presented results with the words: "As written, the paper conclues that there is 'no there there' except perhaps a remarkably potent experimenter retroPK effect. But a brief glance at the figures tells a different story, one I think the author should flesh out as a valuable contribution." As the consequence of this statement, a reanalysis of the data was done with respect to dependence on physical parameters, giving this paper its present look.

before the day of the Lord comes, the great and manifest day. And it shall be that whoever calls on the name of the Lord shall be saved." (Acts 2:20-21; Joel 2:31-32) Is this only superstitious belief or does the lore about the effects of the moon have a grain of truth? Does the moon affect the results of our thinking, wishing, and praying?

In the 1960s, Andrija Puharich observed during telepathy experiments an increase in the strength of effects at the time of full moon and new moon (Puharich, 1973). In the 1970s, Stanley Krippner and colleagues noticed increased psi abilities at the time of full moon. They wrote:

> The data of 80 night time sessions involving ESP in dreams suggest a significant relationship with the lunar cycle. It is hoped that other investigators will inspect their data to see whether similar patterns emerge or, better yet, design experiments to probe this association more thoroughly. (Krippner, Becker, Cavallo, & Washburn, 1972, p. 18)

In the 1990s Radin and Rebman mentioned that psychokinesis effects also arise in everyday life and they sought to test such effects particularly in the casino: "Thus, if one accepts that precognition and psychokinesis are widely distributed human abilities, then, in principle, they may also be present in the casino" (Radin & Rebman, 1998, p. 193). In 1998, they claimed, based on analyses of data from Las Vegas casinos, that the payout rate (the quotient of income and payout rate) varies over a period of time and is correlated with some environmental variables. They found that the peak effect occurred within 1 day of the full moon. They supposed that "some environmental factors may be related to predictable variations in psi performance" (p. 193). One of these environmental factors is the influence of the geomagnetic field: Scores in free response anomalous cognition experiments are negatively correlated with geomagnetic fluctuations (Spottiswoode, 1990). Another one is the tidal effect, the moon's gravitational influence on the earth.

Casino data are hard to get. But for those who are interested in examining the anomalies claimed by Radin and Rebman there is another possibility. Because they reduce the anomalies observed in the casino payout rates to psychokinesis and/or precognition (Radin, 1997, p. 175), this opens the opportunity for the direct use of psychokinesis (PK) or retropsychokinesis data for testing the findings of the Radin and Rebman study. For this test the only public PK database in the World Wide Web was used and analyzed: the quite extensive database of the Fourmilab RetroPsychoKinesis Project.

A first attempt of the author to replicate the findings of Radin and Rebman with the Fourmilab retroPK data seemed to confirm a positive, significant effect in the full moon interval (Etzold, 2000). In

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the summer of 2000 the situation changed rapidly. A significant and strong negative effect in the full moon interval canceled the entire accumulated positive deviation. The replication with the new data failed (Etzold, 2002a). The reason for the unsuccessful replication will be considered in this study.

Many serious studies on lunar effects in human behavior and experience have failed to find any significant effects (Bördlein, 2002; Culver, Rotton, & Kelly, 1988; Guiard, 2002; Wunder & Schardtmüller, 2002). Is Radin's and Rebman's study now the great exception? All of the aforementioned studies showed defects that make it difficult to test the claim of a lunar effect. Krippner and his colleagues analyzed the data of 80 nighttime sessions, 2.7 lunar cycles if these sessions were executed day by day. This is a very small time interval to make a general statement about a lunar effect. A defect of the Radin and Rebman study might be the fact that it represents only one pilot study without any consistent replication. The large error bars in Figure 4 of the Radin and Rebman study (1998, p. 204) more likely indicate a nonsignificant deviation (Boller, 2002). In another publication, Radin demonstrates a replication with new data from lottery payout rates. However, this replication shows the lowest payout rate exactly at the time of the full moon, which Radin explained with increased geomagnetic field values at this time (Radin, 1997, p. 187). In contrast to that, other studies associate high PK effects such as poltergeists or retarding the hemolysis of red blood cells with high geomagnetic field activity (Braud & Dennis, 1989; Gearhart & Persinger, 1986; Palmer, Baumann, & Simmonds, 2005). The hypotheses here are based on Radin and Rebman's observation that low geomagnetic field activity is associated with high positive retroPK effects whereas high geomagnetic field activity might be associated with high negative retroPK effects.

# THE FOURMILAB RETROPSYCHOKINESIS PROJECT

John Walker oversees the ongoing Fourmilab RetroPsychoKinesis Project, which was founded by Matthew R. Watkins in 1996. It deals with an automated remote retroPK experiment that tests mental influences on prerecorded random data. Data are derived from a hardware random number generator (RNG) based on radioactive decay.<sup>2</sup> The participants are encouraged to shift the mean deviation of the RNG only by wishing, wanting, and praying in a predetermined direction. For this purpose, a sequence of random data is transferred to their computers via the World Wide Web and displayed on the screen in animated form. A visual display shows the deviation of the current cumulative score from chance (in terms of standard deviations), which can be displayed in three

<sup>&</sup>lt;sup>2</sup> http://www.fournilab.ch/hotbits/

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different forms: clock, pendulum, and bell curve or "experiment" for a rudimentary numerical report of results. An acoustic signal can be set to sound when the last peak value reached has been exceeded. At the end of each experiment, the final score of the mean shift deviation is calculated and indicated. The participants can select from "for-the-record" runs, "practice," and "demo" experiments, and they can select the direction of their intent. Note that there is a default setting for a particular target direction ("right" for clockwise and the bell curve and "high amplitude" for the swinging pendulum). Three quarters of the test persons used this default setting, which corresponds to a positive deviation as consistent with the participant's intent from the expected mean result in the random data. Each result, including the total of random data used for every forthe-record and practice experiment, is registered on the Fourmilab server in a log file. The demo experiment results use computer-generated pseudorandom data. They are not registered.

The title RetroPsychoKinesis suggests a backwardly oriented causation, that is, an influence of events in the past from the future. But keeping in mind that the retroPK data had already been generated and saved before the test person requested the random data for an experiment, we cannot exclude the interpretation of the observed phenomena as a result of precognition or anomalous cognition. For example, I can choose the goal of an experiment (e.g., left or right), ut if I feel intuitively what might be the correct decision, I do not need o try to influence the REG via psychokinetic efforts in order to get a confirming result.

A summary of the total retroPK for-the-record results and the control run results is updated daily, so everybody may monitor on the web what is going on.<sup>3</sup> No results are provided in the summary for the practice runs, but individual users can see their practice runs in reports of their own experiments.

# Data Generation and Standard Analysis With Fourmilab

For one retroPK for-the-record experiment, 1,024 random bits are requested from Fourmilab's RNG, the "HotBits" server. The theoretical mean value is fixed at 512 hits; the theoretical standard deviation is 16 bits. The empirical standard deviation computed here for the entire control run database was 15.948 bits. The internal clock of the Fourmilab server is set to Coordinated Universal Time (UTC). A check of the correct server time, taken from a retroPK experiment time stamp that was started exactly at 12:01 Central European Summer Time (CEST) = 10:01 UTC of the time of the Physikalisch-Technische Bundesanstalt's atomic clocks,<sup>4</sup> revealed no time difference.

<sup>&</sup>lt;sup>3</sup> http://www.fourmilab.ch/rpkp/experiments/summary/

<sup>&</sup>lt;sup>4</sup> http://www.ptb.dc/en/zcit/uhrzcit.html

However, no "fresh" random bits are supplied. The Fourmilab server maintains an inventory of 8,388,606 random bits (1,048,576 bytes) that is periodically refilled from the HotBits generator, which itself maintains an inventory of 2,097,152 bits (262,144 bytes). Between the generation of the random bits and their use in experiments there is an unknown delay. From the first retroPK experiment on January 11, 1997 up to this analysis, 199,632 for-the-record experiments and 202,958 practice runs were counted in total. They are registered under 19,030 "participants," that is, different e-mail addresses or keywords. Since December 26, 1997 control experiments have been running, one run every hour, totaling 60,163 as of this writing. It is probably one of the largest parapsychological field experiments in the world.

The first registered retroPK run is dated January 11, 1997, 17:33 UTC, and the last retroPK result evaluated here is dated October 8, 2005, 12:45 UTC. Analysis of the retroPK for-the-record experiments included only those labeled as "Record" in the raw data file with no other additions. The experiment database includes a total of 9 runs with incorrect bit counts resulting from errors in the experiment software that have since been corrected. The results of these erroneous runs have been left in the database but are ignored when analyzing it.

An analysis showed that many runs were done with the same date and time stamp, usually 2%, in the retroPK for-the-record experiments and practice runs. These are runs of users who click to start an experiment and, when there is no immediate reply due to internet congestion between their machine and the Fourmilab server, click again. Beside those runs, two large clusters of approximately 1,000 runs were visible in the graph, which led to the suggestion that "fakers" started record experiments, aborted the experiments prematurely and started the next runs, and so on. If the effect observed depends only on failures in internet connections, we might get the same distribution of "failed runs" in the for-the-record experiments as in the practice runs. Approximately 10,000 such experiments with the same date and time stamp in clusters (out of a total of 199,632 for the record experiments) were counted, especially in August 1999, July and August 2001, and January 2004. Such "faker" clusters are completely absent in the practice runs. The total of 14,769 results yielded a z score of 1.31, but they showed no visible full moon effect. These data were kept in the database. In the worst case they increased the random noise in the results, especially in the first evaluation period.

Two time intervals were found in which the HotBits generator was down and no retroPK experiments could be run: from April 28 through June 28, 2002, and from January 1 through January 16, 2003. The daily distribution of the retroPK for-the-record experiment data showed that more than half of all experiments were done in sessions between 18:00 and 5:00 UTC. An overall summary for the total of 199,632 for-the-record experiments of retroPK data in the evaluation period of January 1997

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through October 2005 showed a bit score of 5,830 less than the expected mean bit score and yielded a nonsignificant z score of -0.82.<sup>5</sup> This negative result does not support the retroPK hypothesis. Remarkable in the RetroPsychoKinesis Experiment Summary are the "short-runner" results: 7,232 test persons (or unique identities) did only one experiment and 3,376 did only two runs, and these short-runner groups produced a bit score of -7,739, which amounts to z = -4.10.

There might be two interpretations of these results. One is that weakly motivated and perhaps skeptical persons might have stopped this experiment when their first retroPK score was negative. Therefore they did not climb higher in the table of the "Runs by Subjects Histogram," and their negative score remained in the short-runner group. This could result in an "early stopping" bias. These short-runners might be persons with low motivation for doing the experiments or persons who mistyped their identity (e-mail address or user name) in the experiment's log-in form.

Another possible interpretation is that the significant total result of the short-runners might be a retroactive influence of the data that reflects their unconscious negative attitude toward the experiment. In this case the highly significant result would support the hypothesis that human beings are in fact able to retroactively influence the data. For a clear decision it might be necessary to collect more data about human behavior regarding "beginner's unluck" to test whether an early stopping bias is responsible for the effects observed here.

In the evaluation period, 60,163 control runs were counted, each with 1,024 "trials." The total bit sum of "hits" was 30,805,822, and the theoretical mean was 30,803,456. The standard deviation was 5,550.086, and the deviation from expectation was 2,366. An overall z = 0.426 was computed for the control run database. This might indicate that the HotBits random event generator is working wellinsofar as we only compute summed bit scores of the experiment data. But a test for randomness of the random data revealed that the Fourmilab HotBits server perhaps does not always generate genuine random data.

The HotBits server uses interval timing for generating the output of random bits in connection with a clock, which counts exactly 1,024 bits for every experiment. "In practice, to avoid any residual bias resulting from non-random systematic errors in the apparatus or measuring process consistently favoring one state, the sense of the comparison between T1 and T2 is reversed for consecutive bits."<sup>6</sup> This circuit works like a flipflop. For testing the distribution of multiple bit patterns, the hexadecimal

<sup>&</sup>lt;sup>5</sup> Note that the plot of cumulative z scores in the RetroPsychoKinesis Experiment Summary on the Fourmilab Web site is erroneous and does not report the actual shape of the cumulative deviation from expectation. For more information see: http://bs.cyty.com/men-schen/e-etzold/archiv/science/4milabRPKP/

<sup>6</sup> http://www.fourmilab.ch/hotbits/how.html

values were converted into 4-bit binary equivalents and were rebuilt to a binary random data stream. All control experiment data were converted into binary bits (1,024 binary bits for each experiment). We counted how often a pattern of, for example, "000" or "111" bits (Nm = 3) appeared in the binary database, starting with 1-bit patterns and ending with the maximum length of a bit pattern with the same successive bits. Then all the successive 1-bit patterns were counted; next, the 2-bit patterns; third, the 3-bit patterns; and so on. The same procedure was used for 0-bit patterns. The total number of control runs was 60,163, partitioned in 6,162 samples. Sample size was 9,999 bits per sample. The patterns of single and paired Is and 0s in the HotBits binary random data stream seem to be more than expected. The expected N for 1-bit patterns was 15,403,459.5. The actual result was 15,433,882 for the control data, 30,422.5 more than the theoretical expectation. For 2-bit patterns, the expected N was 7,701,729.8, but the actual result for the control data was 7,710,029, with a surplus of 8,299.2 in comparison to the theoretical expectation. And vice versa, the actual results for the following multi-bit patterns in the range of 4 bits up to 15 bits were below the theoretical expectation. This means that approximately 0.2% of the random data seems not to be really random in nature but to consist of sequences of alternating bits (010101 ... for example), just like the flip flor is running empty without a random trigger. We have obtained 15.948 as the value for the empirical trial-level standard deviation. This is 0.3% less thar. the theoretical expectation of 16 bits per 1,024-bit experiment at the same level.

A similar observation was made in the MMI PortREG replication experiments, when calibrating the REG sources. Jahn and colleagues reported

> a slight excess of the bit sequences 01 and 10 over 00 and 11. The source of the effect is the design of the REG, which includes an XOR alternating template to eliminate actual physical bias in the threshold setting of the comparator.... The size of this excess of alternations is on the order of a few parts in 10,000 and is detectable if data sets are accumulated over a few days. (Jahn et al., 2000, p. 548)

For our purposes this does not affect the total bit score of the outcome of the experiment in a problematic way because for the total bit score it makes no difference whether we summed 1-bits out of a stream of 010101... or out of a stream of 000111... the sum is always the same. The longer the flip-flop is running empty, the more it will bring down the total outcome of the experiment to chance expectation. For the computations here it means that the main tests of the real retroPK for-the-record data should be done by using the difference of retroPK for-the-record data

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and control run data to eliminate any bias or flaw in the data. For future experiments, the random source of the Fourmilab RetroPK Project should be calibrated or the empirical trial-level standard deviation value should be used for statistical purposes instead of the theoretical standard deviation.

# The Hypotheses

Radin and Rebman mentioned an interval of 2 to 3 days centered around the time of the full moon, in which a peak effect was found for 3 of 5 pay-out rates of casino games. They analyzed data of 49 to 50 moon cycles. They wrote: "The odds against chance that up to three of five casino games would independently show peak pay-out rates within one day of the full moon (i.e., slots and roulette) is just over 2,000 to 1." (Radin & Rebman, 1998, p. 208) I do not know how Radin and Rebman calculated these odds against chance, and it is not clear which exact time range is meant by the phrase "within one day of the full moon." If I estimate "one day of the full moon" as 2 days centered around the exact full moon time, the chance that 1 casino game would show its peak pay-out rate in this interval is 1 to 14.5. For 3 games out of 5 the chance is approximately 1 to 2,000. In another context, they wrote that

of the six major jackpots recorded over the course of the four year database, four occurred within one day of the full moon. If we consider this as four "hits" in six events, where the probability of each event is p = 3/29, then the odds of seeing up to four 'hits' occurring where they did by chance is less than 1 in 16,000. (Radin & Rebman, 1998, p. 208)

In this case, "within one day of the full moon" means *3 days* centered around the full moon time. This time interval was confirmed by Radin in a personal e-mail communication on September 15, 2004.

We assume that if there is an unusual anomalous effect in the full moon days, it has the power to cause a significant positive deviation of the retroPK results in days of low GMF, as Radin and Rebman stated that "a possible GMF correlation with casino payout percentages would be negative." (Radin & Rebman, 1998, p. 195)

With reference to the partitioning of the moon cycle in 29 intervals with a constant interval width, an average "daily" interval covers the width of a 12.4° lunar synodic phase. The moon's synodic period is constant, but comparisons between the different durations of lunations showed that the lunar phase degrees in the full moon interval vary with a time interval of up to 1 hr 24 min in a 2-day interval related to the observer on earth. One of the first assumptions was that an anomalous lunar periodic effect might depend on the moon's position in space related to sun and earth. Therefore the date and time stamps of all data with respect to lunar periodic evaluations were converted into a lunar phase degree, which is more precise with respect to moon position than using date and time calculations.

Because there was no exact expectation in which part of the full moon interval we would find an effect, two hypotheses were introduced in the spring of 2000 that marked the narrower and the wider limits of what could be interpreted as the full moon interval. These two hypotheses were published in Etzold (2000, p. 159) for future explorations. They were used in Etzold (2002a) for tests with respect to the lunar phase:

Hypothesis A (one-tailed prediction) is related to Radin & Rebman's probability calculation for 3 of 5 payout rates of casino games and peak effects. "Within 1 day of the full moon" means 1 day before and 1 day after the full moon time, which covers the interval of 166.5° through 192.4° of the lunar phase. The interval width is 25.9°. This is the interval in which we expect a positive significant effect.

Hypothesis B (one-tailed prediction): If we extend this interval by 1 day, then the interval covers the maximum range mentioned by Radin and Rebman in the jackpot calculation of 161.3° through 198.6° of lunar phase, in which they found peak effects and in which we expect a positive significant effect. The interval width is 37.3°.

Both intervals yielded significant results in the first examination (Etzold, 2000, p. 160). However, in the replication study (Etzold, 2002a, p. 78) only the result of the 166.5°-192.4° full moon interval was—now negatively—significant, and we want to examine the reasons for the reversal of the effect. Therefore, the interval width of Hypothesis A (166.5°-192.4°) was chosen for examination here. This interval is also equivalent to 1 day before and 1 day after the full moon as it was used in other studies. As we have no evidence for defining further different full moon time intervals, we have one interval in which we might expect a significant effect.

# Метнор

# Time-Series Analysis With Respect to Moon Phases

For the lunar-periodic analysis, the date and time of every Fourmilab retroPK experiment was converted into a lunar phase degree, as defined by Meeus:

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By definition, the times of New Moon, First Quarter, Full Moon and Last Quarter are the times at which the excess of the apparent longitude of the Moon . . . over the apparent longitude of the Sun is 0, 90, 180 and 270 degrees, respectively. (Meeus, 1995, p. 179)

The software for this conversion of date and time into a lunar phase degree was written by Andreas Hoerstemeier. This conversion was checked against the lunar phase dynamic time data from *Astronomical Tables of the Sun, Moon and Planets* (Meeus, 1995, pp. 190-192). The difference of dynamic time versus UTC is 63 sec for the year 1997 and increased up to 71 sec in 2005. No lunar phase degree errors were found with this software in minute-exact resolution, which confirmed that the software is working well. Because of the minimum phase degree resolution of 0.1° the maximum time error of 11.5 min UTC is possible. A retroPK experiment lasts an average of 2 min from the time the data is requested to the time the test results are presented. We can therefore estimate the maximum possible time error as being up to 14 min in the superposed retroPK data, sorted according to increasing lunar phase degrees.

The bit scores for every experiment were gathered separately by a sliding window function of every "before-selected" interval. This procedure was done synchronously for the retroPK data and the corresponding environmental parameters. Whereas the environmental data and the control run data contain nearly the same number of data points per interval, the retroPK data vary within a large range of numbers. In order to make the data comparable, Rosenthal's effect size *pi* for every interval was computed for the retroPK data, and the average values of the specified intervals were computed for the environmental parameters.<sup>7</sup>

# RESULTS

A first attempt of the author to replicate the findings of Radin and Rebman with the Fourmilab retroPK data seems to confirm them with a positive significant effect of z = 3.24 for the 166.5°-192.4° full moon interval (Etzold, 2000, p. 160). The data of this study constitute Sample 1 in the analyses here. In the summer of the year 2000 the situation changed rapidly. A significant strong negative effect with z = -2.49 in the full moon interval eliminated the entire accumulated positive deviation (Etzold, 2002a, p. 78). The data of this study constitute Sample 2 in the analyses here.

This reversal seems similar to that reported by Radin in his casino study (Radin, 1997, p. 187). But in view of the one-tailed full moon hypothesis, the replication of the positive effect found before failed with the new data. In the discussion of this failed replication, one author recommended testing the data for bidirectional psi (Ertel, 2002) and another author stated that

<sup>&</sup>lt;sup>7</sup> Tables showing the effect sizes, standard errors for effect size values and z scores for each lunar phase interval are available from the author.

# Full Moon Effect in the Fourmilab RetroPK Project

this replication had to fail due to the predictions of the model of pragmatic information (Lucadou, 2002). Another researcher (Houtkooper, 2002) and the author himself (Etzold, 2002b, 2006) assumed an anomalous experimenter effect as the true reason for his findings. Since the effect of the first study was hypothesized, there was a real effect in the second study, which is evident in the difference of both studies with z = 4.03 (p = .00006, two-tailed). But before discussing such far-reaching assumptions, it should be demonstrated that the observed effects cannot be explained by simpler assumptions such as the action of changing physical parameters. If such physical or environmental parameters can be ruled out, it is time to discuss the MPI or the anomalous experimenter effect in the context of the data here. The total results of the entire retroPK for-the-record database in October 2005 showed no significant full moon effect: In the interval of 166.5°-92.4° lunar phase, we found 14,720 test results (bit score = 853) with a total z score of 0.44 (p = .33, one-tailed). All other remaining retroPK 178,704 for-the-record data (i.e., those not within the 166.5°-192.4° full moon interval) yielded a nonsignificant bit score of -8,439 with z = -1.23, nonsignificant. The difference of full moon versus nonfull moon data was z = 1.18. The control run results were nonsignificant in the mentioned intervals.

The very promising initial results of the first few years were not as reliable as they first seemed to be. It would be a great step forward if we knew why. At first we examined known modulator variables such as gravitational forces and geomagnetic and solar activity that could modulate the retroPK effect in the full moon interval. In further steps we created additional hypotheses based on the earlier findings and tested them with the data of Sample 1 and Sample 2 to find out the reasons for the overturning of the effect. These hypotheses could be tested with the additional data that had accumulated in the years 2001-2005, Sample 3.

#### Modulating Variables

Although hundreds of studies seem to provide evidence of PK effects, the existence of such effects remains controversial (Bösch, Steinkamp, & Boller, 2006). The understanding of the parameters that modulate the performance of anomalous effects is necessary for future research. If the parameters were known, we could perhaps generate conditions in laboratory research to improve the results and reduce the number of experiments and the amount of time required to perform them. Based on Radin's and Rebman's findings, hypotheses were formulated that are being tested with the Fourmilab retroPK data.

# The Tidal Effect

The first physical modulator variable for lunar periodic effects was suggested by the graphs of Puharich's telepathy results in relation to lunar

phase (Radin & Rebman, 1998, p. 198): the tidal effect—the gravitational influence of the moon on the earth. With respect to this suggestion, we propose the following hypothesis:

Hypothesis C (one-tailed prediction): the gravitational influence of the moon with the tides is associated with high retroPK scores.

If the tides were a modulator variable of the lunar effects found in the retroPK data, we would expect a similar lunar effect in the new moon interval because the gravitational influence at new moon is as high as at full moon. What we did find was more significant activity in the full moon quarter but no corresponding effect in the new moon position, so we might exclude gravity as a possible influence of retroPK performance.

# Geomagnetic Field

Radin and Rebman also claimed an influence of the moon's position on the geomagnetic field, and they predicted that "a possible GMF correlation with casino payout percentages would be negative" (Radin & Rebman, 1998, p. 195). Based on Radin and Rebman's predictions, we propose the following hypotheses:

Hypothesis D: GMF activity is associated with the lunar phase, especially in times of a quieter geomagnetic field (Radin & Rebman, 1998, p. 209).

Hypothesis E (one-tailed prediction): high retroPK scores in the Fourmilab retroPK database are correlated with low GMF activity (Radin & Rebman, 1998, p. 195).

GMF activity is not a predictable value as, for example, are lunar tidal effects, which can be calculated with great accuracy. We wanted to test Hypothesis D with the evaluation of the 3-hr geomagnetic ap index values, obtained by the World Data Center for Geomagnetism, Kyoto, for the period under analysis. Date and time of the GMF ap index values were first converted into a lunar phase degree value (new moon =  $0^\circ$ , first quarter =  $90^\circ$ , full moon =  $180^\circ$ , last quarter =  $270^\circ$ ). Afterward, the data were sorted in ascending order according to the lunar phase. We assumed that GMF might be high in the full moon intervals and made the comparison with the remaining data. The cumulative scores of the cumulative mean shift deviation (Cum ap) for the geomagnetic field according to the lunar phase were computed as a function of *n* with

Cum ap(n) = ap(l) + ap(2) + ... + ap(n), with Cum ap(0) = 0. Note that by definition Cum ap(0) = Cum ap(N).

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For the ap index values of the entire period, the mean is 13.783 with a standard deviation of 22.083. In the interval of 166.5°-192.4° lunar phase we found 1,805 ap index values with a mean shift deviation sum of -2,546. The remaining 23,733 ap index values yielded a mean shift deviation sum of 2,532.4. For the specified interval, we found that GMF is not high in the full moon period. It is lower than in the average of the remaining lunar cycle data.

With respect to Hypothesis E (positive retroPK scores in the Fourmilab retroPK database correlating with low GMF activity), we found low GMF activity in the full moon interval for the entire database, but not a corresponding high positive result in the total retroPK for-the-record data. So far, the data do not show anything that reliably modulates retroPK performance. This might indicate that GMF alone is not the only parameter that modulates retroPK performance.

#### Solar Activity and GMF

Radin already noted that the lunar-GMF data for 1991 to 1994 used in the analysis of casino payouts resulted in a negative relationship. This suggests, not surprisingly, that the lunar-GMF link is more complicated than a simple linear relationship can model. Other geophysical and extraterrestrial factors are probably involved, including the solar rotation cycle (Radin, 1997, p. 315). Based on Radin's assumption, the next hypothesis was introduced:

Hypothesis F (one-tailed prediction): retroPK scores are negatively correlated with solar activity such as increasing sunspot numbers, coronal holes, and solar flares because GMF activity is driven by solar activity.

The parameters according to Radin and Rebman (1998, pp. 212 and 216) for testing this hypothesis are sunspot numbers, 10.7 cm solar radio flux, and solar wind speed. All of these environmental parameters are related to solar activity. The GMF ap index reacts to solar activity with a longer delay because it is affected by the solar wind, which needs some days to make its way from the sun to the earth. The correlation of these environmental factors with retroPK effects might reveal whether retroPK performance is more likely affected by global factors than by solar activity.

For the sun, moon, and earth interaction it is important to note that the magnetosphere of the earth is blown out by the solar wind into a teardrop shape far into deep space. The magnetotail of the drop stretches in the direction opposite from the sun, actually reaching beyond the lunar orbit. This long magnetotail extends more than 600,000 km from the earth. Models of the magnetotail were described by Tsyganenko (2002a, 2002b). Buffeted by fluctuations in the velocity and density of the solar wind, the magnetosphere's size and shape are constantly changing, especially in times of high solar activity.

The shape of the full moon peak in the retroPK for-the-record data (Etzold, 2000, p. 157) showed that the effect already appears prior to the day of the full moon and decreases after the full moon. This is the time when we can expect the moon to cross low-density plasma in the tail lobes and high-temperature plasma in the plasma sheet of the magnetotail (Lichtenstein & Schubert, 1976). Because the earth revolves around the sun at a high speed, the magnetotail is not oriented straightforwardly like the shadow of the earth on the earth's nightside but is asymmetrically curved in the direction of the arriving moon (Tsyganenko, 2002b), so the time interval between the moon's entering the magnetotail and the full moon is longer than the time between the full moon and the moon's leaving the magnetotail. The lunar cycle interval of the moon's passage through the plasma sheet of the far magnetotail might be between 156° and 195° lunar phase, which means that the moon spends approximately 3 days each month in the magnetotail. In comparison with the interval of Hypothesis A (166.5°-192.4°), the moon enters the plasma sheet 10.5° carlier and leaves it 2.4° later than in the hypothesized interval. Because the size and diameter of the magnetotail change with the changing GMF and solar activity, it is not possible to predict exact lunar phase degrees for the moon's entering and leaving the magnetotail. Also, especially in lunar eclipse times, the moon might move deeper through the plasma sheet of the magnetotail. If this passage of the moon through the magnetotail is responsible for the full moon effect in the retroPK data, we have to look for physical effects of the lunar passage to find the actual modulator variable of retroPK performance.

## Sunspot Number

We know that GMF is modulated by solar activity too. Solar activity varies within the 11-year sunspot cycle. Observation of the sun has shown that sunspots do not appear at random over the surface of the sun but are concentrated in two latitude bands on either side of the equator. These bands first form at mid-latitudes, widen, and then move toward the equator as each cycle progresses. Sunspot activity that is located at the equator might affect the earth more strongly than sunspot activity at mid-latitudes. The sunspot number represents solar activity on the sun itself, but the number does not report whether the earth is affected by solar activity.

We collected the sunspot numbers for the evaluation period and expected that low sunspot numbers would correlate with a high retroPK effect size. The sunspot data were retrieved from the RWC Belgium World Data Center for the Sunspot Index.

# 10.7-cm Solar Radio Flux

Another parameter of solar activity is the 10.7-cm solar flux (F10.7 index). It is the amount of solar noise that is emitted by the sun at the 10.7-cm wavelength. It reflects the actual and precise level of solar activity. Observed F10.7 index data were obtained from the Dominion Radio Astrophysical Observatory in Penticton, Canada. They are available as daily values, measured within three successive hours at local noon. Already in Etzold (2000, pp. 163-165), a significant negative relationship of the F10.7 index with retroPK data was noted. If we find a significant sunspot/retroPK correlation, we have to expect a significant F10.7 index/retroPK correlation also.

# Solar Wind

The dependence of anomalous cognition effect size on solar wind speed was reported by Spottiswoode and May (1997). In this analysis, most of the solar wind data were taken from the database of the ACE spacecraft. ACE data became available in February 1998. Due to the lack of a solar wind database, we had to combine two plasma speed sources for the computation of the correlation. Solar wind data prior to that time were taken from the database of the WIND spacecraft. Both spacecraft are positioned at the L1 libration point, which is a point of earth-sun gravitational equilibrium, in order to continuously observe the solar wind an hour or so before it intercepts the magnetosphere.

Hourly averaged plasma speed data of the WIND spacecraft from January 11, 1997–February 4, 1998, were obtained from the OMNIWeb database of the NASA/Goddard Space Flight Center, and plasma speed data of the ACE spacecraft from February 5, 1998–October 8, 2005, were obtained from the ACE Science Center.

# The Lunar Eclipse Hypothesis

The angle of the moon's position related to the ecliptic plane changes with its revolution around the earth. Eclipses occur only if the moon crosses the ecliptic within a maximum deviation of 0.5° from the ecliptic plane. The moon travels along an orbit inclined by 5.1° to the ecliptic plane, so it passes through the ecliptic plane only twice a month, called the ascending and descending nodes.

Hypothesis G: If the retroPK performance is modulated by the lunar magnetotail passage, we can expect retroPK performance to be improved on days of lunar eclipses when the moon is moving deep through the magnetotail of the earth rather than on other full moon days when the moon is moving through the outer rings of the magnetotail.

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This hypothesis wasalready suggested in Etzold (2000, p. 171). For this test the absolute value of the deviation from ecliptic is taken, because it does not seem to make any difference whether the moon passes in the lobes above or below the magnetotail when its position is far from an expected eclipse in full moon days. On these full moon days the deviation from the ecliptic plane reaches its highest degree value of the lunar cycle (approximately 4-5° deviation from the ecliptic plane) and the moon is moving through the outer rings of the magnetotail (Tsyganenko, 2002b; Wilson, et. al., 2004). This hypothesis would be confirmed by a significant negative correlation with the retroPK data. The designation of the parameter for the lunar deviation from ecliptic is "Deviation from ecliptic" or "Deviation" in the tables.

# **REGRESSION ANALYSIS AND CORRELATIONS**

The environmental parameters are the F10.7 index, the average sunspot number, the solar wind speed, the GMF ap index, and the moon's deviation from the ecliptic, in that order, as independent variables of the analysis. The sunspot number and the F10.7 index represent effects close to the solar surface, whereas the GMF ap index and the solar wind speed represent effects close to earth. The moon's deviation from the ecliptic is the position of the moon inclined toward the ecliptic plane.

We have seen that the HotBits REG is not well calibrated. For safety reasons, the original retroPK for-the-record data were not used for this analysis, but the difference of the effect size *pi* of the retroPK for-the-record data and the control run data was used as the dependent variable of the analysis. If a faulty nonrandom trend were present in the random data, it would be neutralized by computing the difference of the effect size values for every lunar cycle. Certainly, this would increase the random noise in the test and reduce the variance, but it is necessary to examine whether the retroPK for-the-record data are valid.

Because of large clusters of missing data in the control run database, retroPK for-the-record data were included in this test only when corresponding control data for these intervals were available. So we could use retroPK for-the-record data of only 86 lunar cycles out of 105. These are the data of the intervals from December 26, 1997, 23:06 UTC–April 28, 2002, 19:01 UTC and March 12, 2003, 22:47 UTC–Oct. 8, 2005, 12:45 UTC, with a minimum of 15 experiments in the full moon interval of April 11, 1998, and a maximum of 592 experiments on July 4, 2004. The average number of experiments is 153.5 per full moon interval with a standard deviation of 113. Depending on what correlation might be significant, this could be an indicator of the actual location where we can expect an influence on retroPK performance. The following tables list the retroPK for-the-record full moon data correlations and the retroPK for-the-record non-full moon data correlations with environmental parameters. Table 1 shows the descriptive statistics.
# The Full Moon Interval

Variable	М	SD	Ν
RetroPK (- control data)	.00015	.0027	86
F10.7	141.96	51.08	86
Sunspots	74.92	44.32	86
Solar wind	463.73	100.87	86
GMF ap	13.087	12.43	86
Deviation from ecliptic	3.16	1.54	86

TABLE 1 DESCRIPTIVE STATISTICS OF THE 166.5°-192.4° FULL MOON INTERVAL DATA

*Note.* Column 1: Parameters. Column 2: Means. Column 3: Standard deviations. Column 4: Number of samples.

# TABLE 2

PEARSON CORRELATION MATRIX FOR RETROPK FOR-THE-RECORD MINUS CONTROL DATA CORRELATIONS OF THE 166.5°-192.4° FULL MOON INTERVAL DATA WITH ENVIRONMENTAL PARAMETERS AND SIGNIFICANCE FOR PEARSON CORRELATIONS

Pearson Correlation Matrix						
Parameter	RetroPK (- control)	F10.7	Sunspots	Solar wind	GMF	Deviation
RetroPK (- control data) F10.7	1.000 259**	1.000				
Sunspots	198*	.824#	1.000			
Solar wind	061	120	071	1.000		
GMF ap	189*	.187*	.227*	.618#	1.000	
Deviation from ecliptic	228*	018	071	.044	015	1.000

*Note.* Column 1: Parameters. Row 1: Designation. Row 2: Parameters. Row 3-8 with Column 2-7: Pearson's r values with df = 84. \*  $p \le .05$ ; \*\*  $p \le .01$ ; #  $p \le .001$  (one-tailed).

Table 2 reports the Pearson correlation results. The retroPK forthe-record minus control data correlation with F10.7 index data reached statistical significance (p = .008, one-tailed). The correlation with average sunspot numbers yielded p = .034; with GMF ap index, p = .04; and with

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moon's deviation from ecliptic, p = .017. The correlation with solar wind speed was nonsignificant. The high significant correlation of solar wind speed with GMF ap index data and F10.7 index data with sunspot numbers revealed their close relationship.

REGRESSION COEFFICIENTS OF THE 100.3 -192.4 FULL MIOON INTERVAL DATA						
Parameter	Std. beta	t	þ			
Intercept	12	1.724	.089			
F10.7	265	-1.429	.157			
Sunspots	.044	0.235	.815			
Solar wind	.025	0.181	.857			
GMFap	169	-1.196	.235			
Deviation from ecliptic	233	-2.240	.028			

	TABLE 3
REGRESSION COEFFICIENTS OF THE	166.5°-192.4° FULL MOON INTERVAL DATA

Note. Column 1: Parameters. Column 2: Standardized beta. Column 3: Student's t with df = 85. Column 4: Probability (two-tailed).

Table 3 reports the regression coefficients. Of the variance for full moon interval results, 14.4% could be explained by the predictors, but only 6.7% by the F10.7 index and 5.2% by the moon's deviation from the ecliptic. The other parameters were nonsignificant: sunspot numbers, which explained 3.9% of the variance; GMF, 3.6% of the variance; and the solar wind speed, 0.4% of the variance.

F10.7 and the moon's deviation from the ecliptic explain more than 50% of the total variance in a stepwise regression. The standardized beta correlation coefficient for the F10.7 index in the stepwise regression was -.263 with p = .012, and for the deviation it was -.233 with p = .026.

DESCRIPTIVE STATISTICS OF THE NON-FULL MOON INTERVAL DATA						
Variable	М	SD	Ν			
RetroPK (- control data)	.00007	.0007	86			
F10.7	143.4	38.55	86			
Sunspots	78.58	35.77	86			
Solar wind	451.73	54.44	86			
GMFap	14.59	6.33	86			
Deviation from ecliptic	3.16	1.54	86			

TABLE 4 Descriptive Statistics of the Non-Full Moon Interval Data

Note. Column 1: Parameters. Column 2: Means. Column 3: Standard deviations. Column 4: Number of samples.

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# Non-Full Moon Intervals

Table 4 shows the descriptive statistics for the non-full moon interval data, Table 5, the Pearson correlations, and Table 6, the regression coefficients.

TABLE 5
PEARSON CORRELATION MATRIX FOR RETROPK FOR-THE-RECORD MINUS
CONTROL DATA CORRELATIONS OF THE NON-FULL MOON INTERVAL DATA WITH
ENVIRONMENTAL PARAMETERS AND SIGNIFICANCE FOR PEARSON CORRELATIONS

Pearson Correlation Matrix						
Parameter	RetroPK (- control)	F10.7	Sunspots	Solar wind	GMF	Deviation
RetroPK (- control data)	1.000					
F10.7	.037	1.000				
Sunspots	.070	.910#	1.000			
Solar wind	.192	151	184	1.000		
GMF ap	.111	.047	022	.759#	1.000	
Deviation from ecliptic	.070	004	001	.098	.035	1.000

*Note.* Column 1: Parameters. Row 1: Designation. Row 2: Parameters. Row 3-8 with Column 2-7: Pearson's *r* values with df = 84. \*  $p \le .05$ ; \*\*  $p \le .01$ ; #  $p \le .001$  (one-tailed).

No correlations for the retroPK for-the-record minus control data with environmental parameters were significant.

TABLE 6 Regression Coefficients					
Parameter	Std. beta	t	þ		
Intercept		-1.703	.092		
F10.7	143	-0.534	.595		
Sunspots	.250	0.944	.348		
Solar wind	.284	1.620	.109		
GMF ap	094	-0.541	.590		
Deviation from ecliptic	.045	0.416	.679		

*Note.* Column 1: Parameters. Column 2: Standardized beta. Column 3: Student's t with df = 85. Column 4: Probability (two-tailed).

		ABLE /		
	SUMMARY AND ANO VERSUS THE REMAININ	VA FOR DATA O IG DATA OF NO	of Full Moon Inter n-Full Moon Inter	VAL VALS
Lunar phase interval	Full moon: 166	.5°-192.4°	Non-full moon: 0° 192.4°-30	°-166.5° and 60°
Summary	$R^2 = .144, R = .379$	adj. $R^2 = .09$	$R^2 = .059, R = .244$	adj. $R^2 = .001$
ANOVA	F(5, 80) = 2.683	p = .027	F(5, 80) = 1.012	<i>p</i> = .42

The ANOVA is significant for the full moon interval but not for the non-full moon interval data. It was hypothesized that a significant difference exists between full moon data versus non-full moon data. The correlations for the full moon interval were predicted to be negative, and the difference from the non-full moon data were predicted to be significant.

TABLE 8							
DIF	FERENCE BETWEE	N CORRELATIONS					
Parameter RPK minus RPK minus Probability fo control data control data for difference of for full non-full moon full moon vers moon non-full moo							
F10.7	259	.037	.026				
Sunspots	198	.070	.041				
Solar wind061 .192 .05							
GMF ap189 .111 .026							
Deviation from ecliptic	228	.070	.026				
R	.379	.244	.17				

*Note.* Column 1: Parameters. Column 2: RetroPK for-the-record minus control data for full moon interval with N = 86. Column 3: RetroPK for-the-record minus control data for non-full moon intervals with N = 86. Column 4: Probability (one-tailed).

In this test reported in Table 8, the differences of the retroPK for-the-record minus control run data for full moon versus non-full moon data are significant for the F10.7 index, the sunspot numbers, the solar wind speed, the GMF ap index, and the deviation from the ecliptic. The difference of the multiple *R*s was nonsignificant, but overall, these results suggest that retroPK performance in the full moon interval is modulated by solar activity in combination with geomagnetic effects and the moon's deviation from the ecliptic.

# The Full Moon Effect's Overturn

Let us return to the question from the very beginning. After a longer period of an increasing full moon effect in the years 1997 through 1999, the situation changed rapidly in the year 2000, and the effect became strongly negative. As we have seen, one reason might be changing solar and GMF activity. We wanted to test this and extract all the retroPK for-therecord data that were analyzed in the first study, when we had obtained the highly significant positive result in the full moon interval. This is Sample 1. For Sample 2 we extracted all data that were analyzed in the replication study, when we had obtained the significantly negative result in the full moon interval. Due to the lack of 11 months of control data in the first period, the real retroPK for-the-record data were used instead. If, as the . latest tests might indicate, a true effect is present in the data, we would expect an increase of significance in the following tests because we are using real data without any noise induced by the control data, as in the tests before, reported in Tables 1-8. Tests of significance have to be one-tailed because of Hypotheses E and F, which predict negative correlations for the full moon interval. The correlations with the environmental parameters are reported in Table 9.

	Sample 1	( <i>N</i> = 38)	Sample 2	Sample 2 ( <i>N</i> = 18)	
Parameter	r(36)	þ	<i>r</i> (16)	þ	
F10.7 index	268	.052	411	.045	
Sunspot number	273	.048	477	.023	
Solar wind	125	.23	.241	.83	
GMF ap index	243	.072	108	.34	
Deviation from ecliptic	244	.07	.032	.55	

PEARSON CORRELATIONS FOR RETROPK FOR-THE-RECORD DATA OF THE FIRST STUDY (SAMPLE 1) AND THE REPLICATION STUDY (SAMPLE 2) OF THE 166.5°-192.4° INTERVAL WITH ENVIRONMENTAL PARAMETERS

TABLE 9

Note. Column 1: Parameters. Column 2: Pearson's r values for Sample 1. Column 3: Probability (one-tailed) for Pearson correlations. Column 4: Pearson's r values for Sample 2. Column 5: Probability (one-tailed) for Pearson correlations. Probabilities were computed by converting the correlation values into Student's t, which was used for test of significance.

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Although both studies had yielded completely different results in the studies before with a psi-hitting effect z score of 3.24 (Etzold, 2000, p. 160) and a psi-missing effect z score of -2.49 (Etzold, 2002a, p. 78), we obtained here in both cases negative correlations for the F10.7 index, sunspot numbers, and GMF ap index. The solar wind and moon's deviation from the ecliptic yielded negative correlation coefficients for Sample 1 and positive correlation coefficients for Sample 2. These are not reliable predictors of retroPK performance.

In the next analysis, the means and standard deviations for the total full moon data of every parameter were computed. Based on these values, the Stouffer z scores for every parameter of both samples were calculated and compared:

		TABLE 10			
STOUFFER Z SCORES FOR ALL PARAMETERS OF SAMPLE 1 AND SAMPLE 2					
Parameter	Sample 1 ( <i>N</i> =38)	Sample 2 ( <i>N</i> = 18)	z di∬	þ	
RetroPK	2.40	-2.56	3.51	.0004	
F10.7	-1.62	2.91	. 3.20	.0014	
Sunspots	-0.92	3.81	3.34	.0008	
Solar wind	-2.63	0.70	2.35	.018	
GMF ap	-1.65	1.33	2.11	.034	
Deviation from ecliptic	-0.55	-0.06	0.35	.72	

Note. Column 1: Parameters. Column 2: z scores for Sample 1. Column 3: z scores for Sample 2. Column 4: Difference of z scores for Sample 1 and Sample 2. Column 5: Probability for difference of z scores (two-tailed). For computing the retroPK z scores, the empirical mean value and the empirical standard deviation of the effect size values for every lunar cycle interval were used separately as in the case of the environmental parameters.

The changing of the retroPK outcome in Table 10 was accompanied by a large change of the means for the environmental parameters. Remarkable changes were registered for the deviation from the expectation of the perihelion parameters and GMF activity. This might indicate not only that a reliable effect is present but also that the negative correlation of the retroPK versus perihelion parameters is constant in both cases and that the reversal of the mean deviation in the retroPK results is dependent on changing means of solar activity between Sample 1 and Sample 2. The comparison of the z scores

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confirms the observed negative correlation of the retroPK scores with the environmental parameters.

We have analyzed here the data up to August 7, 2001, but the total database includes much more data, up to October 8, 2005. On the basis of the findings here, we predicted that the correlation for retroPK versus sunspots and versus the F10.7 index would be significant for the remaining data. But first let us see in Table 11 how the means for these three samples have changed:

TARE 11

DESCRIPTIVE STATISTICS: MEANS AND STANDARD DEVIATIONS					
Parameter	Total data	<u>Means</u> Sample 1 (N= 38)	Sample 2 ( <i>N</i> = 18)	Sample 3 ( <i>N</i> = 49)	
RetroPK	.5004	0.50126	.49916	.50026	
F10.7	138.09	124.410	173.763	135.605	
Sunspots	71.06	64.294	111.667	61.388	
Solar wind	452.28	409.120	468.930	479.637	
GMF ap	12.35	9.250	15.968	13.423	
Deviation from ecliptic	3.18	3.039	3.156	3.292	
	Sta	indard deviati	ons		
RetroPK	.002	0.028	.001	.0015	
F10.7	51.93	42.960	38.358	57.166	
Sunspots	45.26	40.951	41.108	42.402	
Solar wind	101.01	82.165	115.074	99.340	
GMF ap	11.55	6.446	20.351	9.841	
Deviation from ecliptic	1.55	1.582	1.597	1.524	

*Note.* Column 1: Parameters. Column 2: Values for total full moon data. Column 3: Values for Sample 1. Column 4: Values for Sample 2. Column 5: Values for Sample 3.

Let us see in Table 12 what is the case in the full moon data of Sample 3, which were generated after the time interval of the replication study.

TABLE 1	2
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Parameter	r(47)	þ	zscores
RetroPK		i presidente de la company de la company El company de la company de	-0.60
F10.7	349	.007	-0.34
Sunspots	246	.044	-1.50
Solar wind	032	.41	1.90
GMF ap	065	.33	0.65
Deviation from ecliptic	125	.2	0.52

Pearson Correlations for RetroPK for-the-record Data of the Remaining Data (August 7, 2001–October 8, 2005; Sample 3) of the  $166.5^{\circ}$ -192.4° Lunar Phase Interval With Environmental Parameters (N = 49)

*Note.* Column 1: Parameters. Column 2: Pearson's r values for Sample 3. Column 3: Probability (one-tailed) for Pearson correlations. Column 4: z scores for all parameters of Sample 3. For Sample 3, N is 49. For computing the retroPK z score the empirical mean value and the empirical standard deviation of the effect size value for every lunar cycle interval were used separately as in the case of the environmental parameters. The z score vased on bit score computations is z = 0.27.

These data of Sample 3 also yielded strong negative correlations for the perihelion parameters. Sunspot numbers are significant at the p =.05 level and the F10.7 index is even significant at the p = .01 level. Again, GMF, solar wind speed, and deviation yielded nonsignificant results, but all parameters show negative correlations.

In contrast to Sample 2, the means of the environmental parameters came closer to the means of Sample 1. The z scores for the perihelion parameters were negative. So in total we could expect a positive retroPK outcome for Sample 3. The means for the retroPK data and the correlation results of the perihelion parameters confirm this expectation.

This negative dependence of the retroPK for-the-record data effect size in the full moon interval on the environmental parameters might be responsible for the observed effect's overturn in the year 2000. In times of low solar activity, the retroPK outcome yields significant positive mean deviations. When solar activity increases, the positive deviation shrinks to a nonsignificant level in the range of mean expectation. When solar activity is high, the retroPK outcome appears as significant negative mean deviations. The correlations do not distinguish between psi-hitting and psi-missing; both effects are part of the same scale.

## DISCUSSION

Lunar periodic effects in parapsychological research have been a bone of contention up until now. We collected the material suggesting a full moon effect and tested the large database of the Fourmilab RetroPsychoKinesis Project. We found significant effects, particularly in the full moon phase in the first 3 years of the Fourmilab RetroPsychokinesis Project. But, however encouraging the first result may have been, the effect changed in a later evaluation and finally disappeared. In earlier papers (Etzold, 2002a; Lucadou, 2002; Schestag, 2002; Walach, 2002, Etzold, 2006) the model of pragmatic information by Walter von Lucadou was discussed, which seems to predict such changing and disappearing. Another suggestion was an anomalous experimenter effect (Etzold, 2002b, 2005). This examination revealed that the observed effects appearing, changing, and disappearing could be understood as the result of changing physical parameters. In view of these findings, it is no longer necessary to claim an anomalous experimenter effect or to interpret the effect's changing as a result of the MPI.

No evidence could be found for Hypothesis C (tidal influences). For GMF ap index correlations and solar wind speed we found nonsignificant results in the regression analysis, but in each case the correlations were negative. Only the difference of full moon data versus non-full moon data was significant. This might indicate that the retroPK performance is driver by direct influences of solar activity that come to earth at light-speed rathen than by an indirect influence of solar wind plasma. But this is only half of the truth. In full moon times there is a small window in which participants of the Fourmilab RetroPK Project might be sensitive to subtle solar influences, so when they participate in an experiment for the record, their results are negatively correlated with solar activity.

In summary, we see that the significant results of retroPK for-therecord runs of the full moon interval can be explained mostly by solar predictors such as sunspot activity and the F10.7 index. Both parameters measure activity on the surface of the sun. Their high correlation of r (84) = .824,  $p = 2 \times E-22$  with each other confirms their close relationship.

The results for Hypothesis G indicating that retroPK performance might be higher when the moon is moving deeply through the plasma sheet of the magnetotail than when moving through the outer rings of the plasma sheet were significant in the regression analysis of the full moon interval and in the difference of full moon data versus non-full moon data. In the tests with the database divided into three samples, no significant effects were found. So the question whether the depth of the moon's passing through the magnetotail might cause an effect remains undecided.

Hypothesis F indicated that retroPK effects are negatively correlated with solar activity because GMF activity is driven by solar activity. The basic assumption was that GMF is the primary parameter as given in Hypothesis E (high retroPK scores in the Fourmilab retroPK database are correlated with low GMF activity), so Hypothesis F is dependent on Hypothesis E. The analysis at hand shows that the stronger parameter might be the direct influence of solar activity and not GMF. This might indicate a complex interaction of a direct solar influence accompanied by interactions of the moon with the earth's magnetosphere during full moon. This might also indicate that the parameters we examined are not the primary parameters responsible for the full moon effect found in the retroPK for-the-record data. There might still be an unknown parameter that modulates retroPK performance more strongly.

Some oscillations in the random movement of the retroPK experiment curve for the first evaluation (Etzold, 2000, pp. 157, 161, 171) suggest that the moon's interaction with solar wind and earth's magnetosphere stimulates some kind of electromagnetic waves with ultralow frequencies. It is known that ultra-low frequencies (ULF) and their additional interference frequencies can affect human behavior (Wilson et al., 1990), for example by modulating human brain wave activity. We know that a variety of waves are generated by interactions of the solar wind with the magnetosphere: magnetohydrodynamic waves of ultra-low frequencies, standing waves, and transversal waves, all in the range of 1 mHz 10 Hz (Stellmacher, 1998). These waves and frequencies change according to changing solar activity. In full moon times, the moon passes through the magnetotail: "The observations . . . show that the magnetotail plasma environment strongly influences lunar electromagnetic induction." (Schubert, Sonett, Smith, Colburn, & Schwartz, 1975, p. 279) These changes were registered as altered magnetohydrodynamic wave frequencies in the magnetosphere, especially in times of a quiet geomagnetic field and low solar activity. In such conditions the moon tunes (or detunes) these wave frequencies when crossing the magnetotail (Schubert et al., 1975; Hood & Schubert, 1978). The transfer function amplitude for the moon in the plasma sheet during the full moon interval is approximately 1.7 to 2 for frequencies between 2 and 6 mHz and decreases to 0.7 to 1.2 transfer function amplitude when the moon is in the lobes of the magnetotail. ULF effects in connection with the moon's passage through the magnetotail were explored in the 1970s during the Apollo Program but unfortunately those studies were not continued.

ULF waves, especially in the range of 1-10 mHz, could be responsible for the varying retroPK performance, as observed in the full moon data here. If this were confirmed, the use of artificial magnetic field waves in the 1-10 mHz range might be promising candidates for producing high-scoring psychokinesis results in laboratory experimental research.

Many studies with respect to human behavior in the past have failed to find any lunar effect. The present examination shows that the situation is much more complicated than previously believed. We have found two physical parameters that we think affect retroPK performance: solar activity and the lunar phase. The next period of low and increasing solar equatorial sunspot activity is expected in the years 2007 through 2011. This might be a good time for a new high full-moon-effect phase in the coming years of the Fourmilab RetroPsychoKinesis Project.

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# AUTHOR NOTE

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# PERSONALITY AND MOTIVATIONS TO BELIEVE, MISBELIEVE, AND DISBELIEVE IN PARANORMAL PHENOMENA

#### By J. E. KENNEDY

ABSTRACT: Paranormal beliefs and experiences are associated with certain personality factors, including absorption, fantasy proneness, and the Myers-Briggs intuition and feeling personality dimensions. Skepticism appears to be associated with materialistic, rational, pragmatic personality types. Attitude toward psi may also be influenced by motivations to have control and efficacy, to have a sense of meaning and purpose in life, to be connected with others, to have transcendent experiences, to have self-worth, to feel superior to others, and to be healed. The efforts to obtain reliable control of psi in experimental parapsychology have not been successful. Given the lack of control and lack of practical application of psi, it is not surprising that those who are by disposition materialistic and pragmatic find the evidence for psi to be unconvincing. When psi experiences have been examined without a bias for control, the primary effect has been found to be enhanced meaning in life and spirituality, similar to mystical experiences. Tensions among those with mystical, authoritarian, and scientific dispositions have been common in the history of paranormal and religious beliefs. Scientific research can do much to create better understanding among people with different dispositions. Understanding the motivations related to paranormal beliefs is a prerequisite for addressing questions about when and if psi actually occurs.

The striking diversity of beliefs about paranormal phenomena is a noteworthy and poorly understood characteristic of humanity. On the extremes, some people are almost violently opposed to the very concept of paranormal phenomena and others are equally adamant that such phenomena are real. Neither side has prevailed and there is no indication that either is getting the upper hand (Mathews, 2004; Musella, 2005). Even those who claim tempered scientific perspectives sometimes appear to be living in different worlds. For example, Schumaker (1990), a skeptic, described belief in paranormal phenomena as one of the strongest human motivations and as resulting from the "terror" of facing reality without irrational illusions. On the other hand, Tart (1984), a proponent of psi, described the fear of psi as a powerful, pervasive, instinctive human motivation that prevents the acceptance and occurrence of psi.

As might be expected, the proposed explanations for paranormal beliefs tend to reflect the attitudes of the person proposing the explanation. In his extensive review, Irwin (1993) noted that "much of the skeptical research on the topic seems to have the implicit objective of demonstrating that believers in the paranormal are grossly deficient in intelligence, personality, education, and social standing" (p. 6). These skeptical efforts have also carefully ignored the obvious fact that the deep hostility of some extreme skeptics indicates an irrational prejudice that needs explanation.

At the same time, proponents have done little to offer alternative models or to explain the prevalence of misbeliefs about psi. Many people apparently misinterpret normal experiences as paranormal. Broughton (1991, p. 10) noted that surveys typically find that over half of the population report having had a psi experience, but closer examination of the cases suggests that only about 10% to 15% of the population have had experiences that appear to be possible psi. This estimate is consistent with early surveys (Rhine, 1934/1973, p. 17) and with later studies (Haight, 1979; Schmiedler, 1964). At least 70% to 80% of the people reporting psychic experiences appear to be misinterpreting the experiences.

The motivations for such extensive misinterpretations need to be explored. In fact, understanding the motivations related to attitude toward psi would seem to be a prerequisite for understanding whether, when, and how psi occurs.

The purpose of this article is to summarize and discuss some of the key personality factors and motivations that appear to be relevant for understanding why people believe, misbelieve, and disbelieve in the paranormal. Of course, innumerable personal, social, and cultural factors may have a role in attitude toward the paranormal. The present discussion is intended as a starting point focusing on selected prominent factors. These factors are diverse, and the possibility of conflicting motivations should be recognized.

#### BACKGROUND

#### Terminology and Concepts

Certain distinctions in the terminology and concepts related to paranormal phenomena are useful for this discussion. According to the definitions in the American Heritage Dictionary (3rd Edition), "paranormal" is a broad term that means beyond scientific explanation. The term "psychic" is more narrow and refers to extraordinary mental powers such as ESP. This definition of psychic implies that a person is the causal factor for the phenomena, although it can include communication with the spirit of a deceased person. The term "supernatural" means outside the natural world or attributed to divine power. Supernatural typically implies paranormal phenomena caused by a nonphysical being or power that has motivations and intentions separate from those of living persons. Such beings are often considered as God or gods if the motivations are beneficial for people, or as the devil or demons if the motivations are detrimental or evil. The term "miracle" means an event with a supernatural origin. According to the glossary in the Journal of Parapsychology, the term "psi" refers to ESP and PK, which also implies that the phenomena are produced by the mind of a person. Also in that glossary, the term "parapsychology" primarily refers to the study of ESP and PK. Supernatural interpretations tend to be excluded from parapsychological writings and are often assumed to be misinterpretations of psi phenomena produced by living persons. The extent to which psychic and supernatural are different interpretations for the same basic phenomena is an interesting empirical question that remains to be investigated.

The most widely used measures for paranormal beliefs are sheepgoat scales based on psychic phenomena (Palmer, 1971; Thalbourne & Delin, 1993) and the much broader paranormal beliefs scales that also include things like the Loch Ness monster, that black cats bring bad luck, and heaven and hell (Tobacyk & Milford, 1983). The sheep-goat scales were developed by parapsychologists and the broader paranormal belief scales were generally developed by researchers who were more skeptical. The number, validity, and orthogonality of factors in paranormal beliefs have been persistent, unresolved topics of debate (Hartman, 1999; Lange, Irwin, & Houran, 2000; Lawrence, Roe, & Williams, 1997; Tobacyk & Thomas, 1997).

The most widely held beliefs about paranormal phenomena involve supernatural religious interpretations and are not included in these scales. In U.S. national surveys, 89% of respondents strongly or somewhat agreed that "there is a God who watches over you and answers your prayers" (Barna, 1991) and 82% agreed that "even today, miracles are performed by the power of God" (Gallup & Castelli, 1989). Measures that do not capture the most widely held beliefs may be of limited value in understanding the characteristics of paranormal beliefs.

## Personality and Genetics

Behavioral genetic and related research indicates that personality has significant genetic components and is also influenced by experiences, particularly during childhood (Cary, 2003; Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Heath, Cloninger, & Martin, 1994; Rutter, Pickles, Murray, & Eaves, 2001; Stallings, Hewitt, Cloninger, Heath, & Eaves, 1996; Tellegen et al., 1988). Attempts to isolate genetic from environmental effects are difficult because of methodological factors, such as the possibility that genes can influence which environments a person chooses to experience (Rutter et al., 2001). However, for purposes of the present article, the basic concept that personality depends on both genetic dispositions and environmental experiences is sufficient.

The discussions of personality types here are primarily intended to show that these factors appear to have a significant role in attitude toward the paranormal. These discussions are not intended to limit the recognition of the variability among people or the likelihood that an individual may have motivations associated with various personality factors. The research studies discussed here have often employed the Myers-Briggs personality model. A summary of that model is described in the Appendix for those who may not be familiar with it. Other personality models could probably be developed that would be more useful for research on paranormal beliefs.

# Capricious, Evasive Psi

Discussions of belief in psi must recognize the problematic properties of psi experiments that make scientific conclusions controversial. The inability to develop reliable practical applications of psi after a century of research indicates a fundamental lack of scientific progress (Kennedy, 2003a). The research efforts have not been able to overcome the capricious, evasive properties of psi that include unintended and undesired psi-missing and loss of effects. If the basic assumptions of experimental parapsychology were true, gambling industries such as casinos, lotteries, and commodity markets would not be expected to be viable. The fact that these industries remain in business and appear to make profits consistent with the laws of probability places significant restrictions on the scientific expectations about psi. Parapsychological writings generally have not addressed this central dilemma. Greater acceptance of and attention to the capricious, evasive nature of psi may be a prerequisite for scientific progress in parapsychology (Kennedy 2003a).

One of the most revealing properties of psi research is that metaanalyses consistently find that experimental results do not become more reliably significant with larger sample sizes as assumed by statistical theory (Kennedy, 2003b; 2004). This means that the methods of statistical power analysis for experimental design do not apply, which implies a fundamental lack of replicability.

This property also manifests as a negative correlation between sample size and effect size. Meta-analysis assumes that effect size is independent of sample size. In medical research, a negative correlation between effect size and sample size is interpreted as evidence for methodological bias (Egger, Smith, Schneider, & Minder, 1997).

The normal factors that can produce a negative correlation between effect size and sample size include publication bias, study selection bias, and the possibility that the smaller studies have lower methodological quality, selected subjects, or different experimenter influences. All of these factors reduce confidence in a meta-analysis. However, for psi experiments, the failure to obtain more reliable results with larger sample sizes could be a manifestation of goal-oriented psi experimenter effects or decline effects (Kennedy, 1995; 2003a). Even if these effects are properties of psi, parapsychologists cannot expect that other scientists will find the experimental results convincing if methods such as power analysis cannot be meaningfully applied. Further, for the past two decades, the debates about the reality of psi have focused on meta-analysis. The evidence that psi experiments typically do not have properties consistent with the assumptions for meta-analysis adds substantial doubts to the already controversial (Kennedy, 2004) claims about meta-analysis findings in parapsychology.

# THE TRANSCENDENCE FACTOR

Paranormal and mystical beliefs are closely related. The personality factors most consistently associated with paranormal beliefs and experiences are the interrelated cluster of absorption, fantasy-proneness, and temporal lobe symptoms. All three of these personality constructs involve a high degree of imagination and fantasy. These factors generally correlate in the .5 to .6 range with each other and with mystical and paranormal experiences (summarized in Kennedy, Kanthamani, & Palmer, 1994).

Thalbourne (1998; Lange, Thalbourne, Houran, & Storm, 2000) found that mystical experience, belief in paranormal phenomena, absorption, and fantasy proneness actually constitute a single factor. He proposed that it reflects a tendency for unconscious processes to emerge into consciousness and called the factor *transliminality*. Hartmann's (1991) earlier concept of thin boundaries of the mind is the same idea and has been associated with paranormal experiences (Palmer & Braud, 2002; Richards, 1996) and with the transliminality scale (r = .66) (Houran, Thalbourne, & Hartmann, 2003).

Based on his work with the Myers-Briggs personality model, Keirsey (1998) stated that people having intuitive, feeling (NF) personality types are mystical in outlook and often explore occultism, parapsychology, and esoteric metaphysical systems. Those with NF dispositions aspire

to transcend the material world (and thus gain insight into the essence of things), to transcend the senses (and thus gain knowledge of the soul), to transcend the ego (and thus feel united with all creation), [and] to transcend even time (and thus feel the force of past lives and prophecies). (p. 145)

Research studies have found that belief in paranormal phenomena is associated with the N and F personality factors (Gow, et. al., 2001; Lester, Thinschmidt, & Trautman, 1987; Murphy & Lester, 1976). In a study of a technique attempting to induce a sense of contact with someone who had died, 96% of the participants with NF personality types reported after-death contact experiences, whereas 100% of the participants with ST (sensing, thinking) personality types did not have these experiences (Arcangel, 1997). In a survey of parapsychological researchers, Smith (2003) found that the F factor was associated with experimenters who were rated as psiconducive. Temporal lobe symptoms have been found to be associated with the N and P Myers-Briggs personality factors, and to a weaker extent with F (Makarec & Persinger, 1989). Thin boundaries have been found to be associated with NF personality dispositions (Barbuto & Plummer, 1998).

Taken together, these findings indicate that certain people have innate interests in and motivations for mystical and paranormal experiences. Behavioral genetic research indicates that absorption, the Myers-Briggs personality types, and interest in spirituality all have significant genetic components similar to other personality factors (Bouchard & Hur, 1998; Cary, 2003; Hammer, 2004; Tellegen et al., 1988).

# Common Source for Psi and Mysticism

Psychical and mystical experiences have several characteristics in common that suggest that they derive from the same or very similar processes.

*Personality*. As discussed above, paranormal and mystical experiences are associated with the same personality characteristics and appear to be components of one personality factor.

Unconscious. Psychical and mystical experiences are both thought to arise from an unconscious or higher part of the mind and to be facilitated by efforts to still the conscious mind and to reduce superficial unconscious activity. Both types of experience are viewed as a link or doorway to a higher realm of interconnectedness. In fact, the primary difference is that psychical experiences provide information about the material world whereas mystical experiences provide information about the higher realm of interconnectedness itself. William James (1902/1982) noted that the knowledge revealed in mystical experiences may pertain to sensory events (e.g., precognition or clairvoyance) or to metaphysics.

Lack of control. Both psychical and mystical experiences are spontaneous and normally outside of direct conscious control. At best, one can create conditions that set the stage for the experiences. Claims for direct, sustained, consistent control of mystical experiences or psi are very controversial (Kennedy, 2003a; Kornfield, 2000). Such claims for sustained control appear to be illusions in virtually all cases.

After-effects. As discussed in a later section, the primary effects of both mystical and paranormal experiences are increased sense of meaning in life, interconnectedness, and spirituality. Mystical experiences and paranormal miracles have both had major roles in most spiritual traditions (Woodward, 2000).

Lack of evident evolutionary advantage. According to the prevailing scientific perspective, humans have emerged through biological evolution, which is driven by self-serving enhancement of reproductive and associated material success. However, mystical and psychical experiences both have characteristics that do not appear to be driven by the self-serving materialism associated with biological evolution. The pursuit of mystical transcendence in the form of monastery traditions inhibits reproductive success and has the goal of reducing the motivations for material self-interest and status. These conditions are in direct opposition to the assumed driving forces of biological evolution. Similarly, the inability to develop or demonstrate practical applications of psi prevents its use for material self-interest (Kennedy, 2003a; in press). The personality constructs of thin boundaries and transliminality are both reported to be associated with susceptibility to mental illness (Hartmann, 1991; Thalbourne & Delin, 1994), which further detracts from any evolutionary advantage.

On the other hand, speculations about the benefits of these personality types that may keep them in the gene pool include: (a) enhanced imagination and creativity (Hartmann, 1991; Thalbourne & Delin, 1994), (b) enhanced flexibility and adaptability (Hartmann, 1991), (c) reduced tendency to create stress and conflict (Hartmann, 1991), (d) enhanced tendency to develop a strong sense of meaning and purpose in life and to inspire a sense of purpose in others (Keirsey, 1998; McClenon, 1994; White, 1997b), (e) highly cooperative, compassionate, altruistic, and motivated by ideals (Keirsey, 1998), and (f) enhanced self-healing through placebo and hypnotic effects (McClenon, 2002). The evolutionary implications of mystical and paranormal experiences remain an open and fascinating topic of inquiry.

# THE MOTIVATION FOR CONTROL

The need for control has been investigated in numerous studies and is a basic human motivation that influences many activities, including religion and science (Baumeister, 1991; Schumaker, 2001; Spilka, Hood, Hunsberger, & Gorsuch, 2003). Spilka and colleagues (2003, pp. 46-47, 58, 484-485) note that need for control has many aspects and has a genetic component that varies among people. Control can be direct, interpretive, predictive or vicarious and may involve self, powerful others, God, or supernatural powers in a self-directive, collaborative, or deferring mode.

Baumeister (1991) considered control as part of a need for efficacy, which includes having an impact on the world and changing the world. He considered this need to be an aspect of obtaining a sense of meaning in life.

From the perspective of daily life, the drive to impress one's self on the world manifests in various forms, including creating technology, building construction projects, climbing or conquering mountains "because they are there," making scientific discoveries, writing books, and creating various forms of entertainment. Conflicts with other people are another way of impressing one's self on the world. This includes various forms of competition in sports, business, and politics. The development of computer viruses may be some of the clearest evidence for this motivation. Most computer viruses have no apparent purpose other than for the developers to impress themselves on the world just because they can. As indicated by the fact that computer viruses are developed almost entirely by males, this motivation appears to be more prominent in males but certainly can also be present in females.

## The Rational Scientific Personality

Keirsey (1998) described the development of rational scientific understanding and pragmatic application of science as the central motivations for people with intuitive, thinking (NT) personality types. People with these dispositions are naturally attracted to the process and results of the scientific method. Of course, experiencing scientific culture presumably enhances rationality and empiricism. The tendency to elevate a rational, scientific, mathematical style of thinking to an almost religious-like level of commitment and faith is widely apparent in scientific writings.

The inability to reliably control, predict, or understand psi may exclude paranormal phenomena from the interests of many who have pragmatic, scientific orientations. From this perspective, it is not surprising that scientists tend to be skeptical of psi (McClenon, 1982; McConnell & Clark, 1991). Prediction is the foundation of science, and control and application provide the most compelling evidence and value. For example, the concepts of quantum physics are as radical as the ideas of parapsychology; however, quantum physics has provided numerous successful applications, including lasers and transistors. If psi experiments produced reliable results, and particularly if they produced useful applications, scientists would likely accept the phenomena and begin developing theories for further control and application.

Skeptical scientists tend to explain belief in psi as due to a failure of rational, empirical analysis (e.g., Alcock & Otis, 1980; Blackmore & Troscianko, 1985; Gray & Mill, 1990). These explanations often imply that all people should share the scientist's devotion to rational, empirical analysis. The possibility that alternative values, personalities, and ways of processing information may also have value is rarely acknowledged in these writings.

Skeptics also tend to have a greater internal locus of control (belief that they control the events in their lives) than those who believe in psi (summarized in Irwin, 1993). This is consistent with a stronger motivation for control by skeptics or possibly with less belief in supernatural influences.

I suspect that there is a closely related motivation for rational explanations but with less emphasis on pragmatic application and empiricism. This motivation would underlie the pursuit of philosophy and the more abstract, intellectual approaches to religion. However, I have not found a specific personality description that aligns with such a motivation.

# Experimental Parapsychology

Belief in instrumental control of psi occurs in spite of the persistent failure to develop reliable applications of psi. The assumption of instrumental control of psi is the foundation for experimental parapsychology as well as for occultism, new age beliefs, and commercial psychics and fortune tellers. These belief systems basically view psi as a magical power that can fulfill a person's wants or provide information about the future.

Numerous authors have speculated that belief in psi results from an illusion of control or mastery over uncertain events motivated by the need for control (e.g., Blackmore & Troscianko, 1985; Irwin, 2000; Schumaker, 1990; Vyse, 1997). Motivations for control probably have a significant role in the pursuit of experimental parapsychology. Carrying out a psi experiment with an expectation of success requires the assumption and belief that people can control psi, even if only to a weak, statistical degree. However, other factors besides control also appear to be involved in the pursuit of experimental parapsychology. These factors may include an intense fascination with the subject matter and a tendency to overlook the problematic properties of the results or to optimistically assume that these properties will soon be overcome.

#### The Propensity to Explain

The motivation for control is closely linked to motivations to learn and to understand causes (Baumeister, 2005). The evolution in humans of imagination, symbolic thought, memory, symbolic communication, planning based on hypothetical futures, and creativity greatly enhanced the abilities to learn, to control, and to adapt (Baumeister, 2005; Donald, 2001).

However, the propensity to explain may go beyond achieving control. Donald (2001) argued that the human mind and human culture co-evolved, with the mind becoming extremely plastic in order to adapt to the diversity of culture. He argued that culture and particularly myths provide a needed framework for experiencing life and are actively sought. The cultural framework for experiencing and explaining life can include myths, religion, and science.

Science in theory focuses on empirically verifiable explanations but in practice often seems to be a constant struggle to control the propensity to imagine extensive myths. In the social sciences in particular, a few selected observations tend to be extrapolated way beyond scientific confidence to develop all-inclusive theories that, like myths, are abstract explanations with little empirical support. One can make a strong argument that the writings and associated subcultures of psychoanalysis and behaviorism were more similar to religions than to science. Even for the most well established physical forces such as gravity, the diversity of conceptual explanations over the years (general relativity, quantum physics, string theory, etc.) indicates that scientific concepts are products of imagination that are at least as much cultural fads as enduring truths.

The propensity for mythology, including within science, makes it likely that the diversity of attitudes toward the paranormal will remain for the foreseeable future. In modern pluralistic societies, people are exposed to and can select from a diversity of alternative world views and mythologies.

## Summary

The motivation for control may contribute to both skepticism and belief in psi. Research on various aspects of the motivation for control and its interaction with other psychological factors is needed to understand its role in attitude toward the paranormal. The initial evidence suggests that skeptics may tend to have a greater need for control. In fact, the speculations that an illusion of control is a significant factor in psi beliefs have primarily been proposed by skeptics and may be projections of their own needs for control.

# THE MOTIVATION FOR MEANING AND PURPOSE

If one moves beyond the motivation for control and looks at psi on its own terms, a different motivation emerges as prominent. Many people report experiences of ostensible spontaneous paranormal phenomena that occur without attempting to elicit or control the phenomena (Rhine, 1981; Stokes, 1997). Even a casual review of these reports indicates that the experiences do not seem to be guided by self-serving, materialistic motivations or needs for control.

Research indicates the primary effect of psi experiences is an altered worldview and an increased sense of meaning and purpose in life and spirituality (Kennedy & Kanthamani, 1995; McClenon, 1994, 2002; Palmer, 1979; Palmer & Braud, 2002; White, 1997a, 1997c). For example, Dossey (1999, p. 3) describes how a series of unexpected paranormal experiences changed the direction of his professional career. Similarly, a survey of people who were interested in parapsychology and reported having paranormal or transcendent experiences found that (a) 72% agreed with the statement "As a result of my paranormal or transcendent experience, I believe my life is guided or watched over by a higher force or being," (b) 45% agreed with the statement "I feel like I have a purpose or mission in life as a result of my paranormal or transcendent experience(s)," (c) 25% agreed with "One or more paranormal or transcendent experiences motivated me to make a major life change that I was not previously thinking about making," and (d) 38% agreed with "One or more paranormal or transcendent experiences seemed to confirm or reinforce that I was doing what I should be doing," (Kennedy & Kanthamani, 1995). White (1997a, 1997c) has collected and

evaluated cases of exceptional experiences and found that transformative aftermaths that redirected a person's worldview and focus in life were common. Ostensible paranormal miracles have been a decisive factor in persuading people to join particular religious groups (McClenon, 1994).

The transformative psi experiences appear to guide a person rather than the person guiding psi. This is a significantly different world view than the assumptions of experimental parapsychology. These types of cases may induce an attitude of a humble seeker rather than a sense of control. Dossey (1999, p. 3) characterized his series of psi experiences as: "It was as if the universe, having delivered the message, hung up the phone. It was now up to me to make sense of it."

The source of the experience is viewed as external to the person. Without a bias for efficacy and control, the spiritual implications and supernatural aspects of paranormal phenomena predominate. The relatively few spontaneous psi cases that appear to have direct benefits related to motivation may actually serve as vehicles for this transformative aspect of psi (Kennedy, 2000).

White (1993) suggested that the best research strategy for parapsychology may be to let psi lead us rather than to try to control or apply psi. One could argue that the persistent failure to control psi leaves no choice but to pursue a more humble, learning approach.

## The Need for Meaning

Baumeister (1991) integrated a wide diversity of information and ideas about the human need for a sense of meaning in life. He concluded that there are at least four aspects to the sense of meaning in life. These are:

*Purpose.* The need to be able to interpret current events in relation to expectations about the future, and to have and achieve goals.

*Value*. The need to know right and wrong behavior and to regard one's actions as right and good.

*Efficacy*: The need to be able to control the environment and to have an impact on the world.

*Self-worth*: The need to have self-respect and the respect of others, which is typically based on feeling superior to others.

Baumeister (1991) described religion as the central source of meaning in life historically. The need for meaning is also reflected in the propensity for myths described by Donald (2001). Religion can fulfill all four aspects of meaning. Baumeister and Donald both noted that science has an increasing role in the cultural explanatory framework.

Baumeister also commented that science is highly successful at providing control and efficacy but does not provide a sense of purpose, values, and self-worth. He noted that this makes it more difficult to obtain a sense of meaning and to handle stresses and traumas. Schumaker (1995,

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2001) similarly argued that religion and transcendence have important roles in human mental health that are not being fulfilled by the secular rationality and materialism of modern society. Schumaker (2001) argued that the declining meaning, purpose, values, and spirituality are contrary to human nature and are causing mental health and ecological crises.

Paranormal beliefs and experiences can be directly related to purpose, efficacy, and self-worth. The extent to which paranormal beliefs provide a sense of meaning and purpose only for persons who are by disposition attracted to transcendence and spirituality is an important topic that merits empirical investigation.

# THE MOTIVATION FOR SELF-WORTH/SUPERIORITY

Baumeister (1991) noted that the motivation for self-worth often manifests as a need to feel superior. Judging oneself as better off than others is a significant factor in human happiness, and comparing oneself to less fortunate persons is a standard technique for coping with unfortunate events (Baumeister, 1991; Myers, 1992). Exaggerated positive self-evaluations and illusions have long been recognized as a characteristic of people (Hornsey, 2003; Taylor & Brown, 1988). Human males in particular tend to have an innate drive to compete for power and status and to feel superior to most other persons (e.g., Campbell, 2002; Geary, 1998).

The motivations for superiority and efficacy (including control) are closely related, particularly when competition is involved. The tendency to divide into polarized groups and attempt to prevail over opponents provides both efficacy and superiority. The motivation of some individuals to persuade others to accept their views, beliefs, and values may be related more to these drives, similar to sports competitions, than to the specific content of the beliefs. This could be a motivating factor for both belief and skepticism about the paranormal.

# Superiority Through Authority and Dominance

Keirsey (1998) described the sensing, judging (SJ) personality types as materialistic, distrusting of fantasy and abstract ideas, and tending to feel a duty to maintain traditional rules of right and wrong. These personality types focus on external authority and tradition rather than internal experience.

People with STJ personality types tend to rise to positions of leadership and authority in hierarchical organizations (Keirsey, 1998; Kroeger, Thuesen, & Rutledge, 2002). Fudjack and Dinkelaker (1994) noted that the masculine "extraverted/rational-empirical/pragmatic/ materialist" ESTJ personality is prominent in western culture and tends to prefer hierarchical organizations that emphasize power and control rather than creativity and flexibility. Kroeger, Thuesen, and Rutledge (2002) administered the Myers-Briggs personality test to over 20,000 people in all levels of a wide variety of corporate, government, and military organizations. Across these diverse groups, they found that 60% of 2,245 people in top executive positions had STJ personalities (ESTJ or ISTJ). The proportion of STJ types increased as the level on the management hierarchy increased.

On the other hand, only about 1% of top executives had NFP personalities, which would be more interested in psi and mysticism. For comparison, general population samples have found STJ for 26%-43% of males and 18%-29% of females, and NFP for 6%-12% of males and 9%-18% of females (Macdaid, McCaulley, & Kainz, 1986). Kroeger, Thuesen, and Rutledge also commented that 95% of top executives were T (thinking) types rather than F (feeling) types.

This rational, pragmatic, materialist personality bias in the upper echelons of power and status may be a major factor in the institutional skepticism and resistance to psi described by Hansen (2001). This value system may also be associated with the "hypercompetition" and "hypermaterialism" that Schumaker (2001) believes prevail in modern society and contribute to depression and anxiety. Somit and Peterson (1997) discuss the evolutionary and social aspects of the biological basis for dominance and hierarchy.

Baumeister (1991) observed that religion often provides a sense of superiority. He also noted that this sense of superiority unfortunately has a long history of hostility and violence toward those who are viewed as being inferior. The sense of superiority is particularly prominent in fundamentalist groups, which are found among most of the world's major religions and believe that their particular set of beliefs and values, and only theirs, has been chosen for a special relationship with God (Hunsberger, 1996). Fundamentalists also emphasize authority and tradition. Religious terrorists are characterized by extreme fundamentalism, including superiority, adherence to the authority of a particular tradition and its leader(s), and lack of respect for, dehumanization of, feelings of threat by, and hostility toward people with different beliefs and values (Stern, 2003).

Research indicates that the S personality types are associated with conservative religions that emphasize institutional religious authority and tradition whereas the intuitive (N) types are associated with more liberal, subjective, experiential approaches to religion and tolerance for religious uncertainty (Francis and Ross, 1997; Francis and Jones, 1998, 1999; Macdaid, McCaulley, & Kainz, 1986). Similarly, greater dogmatism was associated with the S and J personality types (Ross, Francis, & Craig, 2005).

Other personality models describe related factors like authoritarianism, traditionalism, or right-wing authoritarianism (Altemeyer, 1996; Carey, 2003, pp. 395-398; Spilka et al., 2003, pp. 467-468). Altemeyer (1996) argued that fundamentalism is a religious manifestation of the authoritarian personality. Monaghan (1967) described "authority-seeker" as one of the main motivations for attending a fundamentalist church.

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Fundamentalist religions often consider mystical or paranormal experiences as delusions or dangerous events. Pentecostal and charismatic religious movements emphasize "gifts of the spirit," including prophesy, healing, recognition of spirits, performance of miracles, wisdom, and knowledge (Roberts, 1995, p. 370; Rosten, 1975, pp. 591-592). Christian fundamentalists frequently have conflicts with Pentecostals and charismatics because fundamentalists give primacy to the inerrant authority of the Bible rather than to direct spiritual experience (Roberts, 1995, pp. 370-371).

Tensions between those who give primacy to the authority of tradition rather than to direct mystical and miraculous experiences have occurred for centuries, as would be expected if personality dispositions have a role. The life and death of Jesus were based on conflicts between those who maintained rules, authority, and superiority of past traditions versus proponents of inspired teachings supported by claims of paranormal phenomena. Such tensions were also apparent in the reactions within Christianity to the desert ascetics and in the Protestant Reformation (Woodward, 2000). One argument that goes back to at least the sixteenth century is that the miracles described in the Bible were real and were needed to establish the authority of the Bible, but once that authority was established, miracles were not needed and claims for post-biblical miracles are fraudulent or the work of the devil (Mullin, 1996, pp. 12-16). The variation in beliefs among individuals and groups should also be kept in mind. Some of those who focus on authority also believe that supernatural interventions sometimes occur in post-biblical times.

The hostility of some extreme skeptics toward those who believe in paranormal phenomena has noteworthy similarities with religious fundamentalism and appears to be a manifestation of dominance and superiority (Kennedy, 2003c). Like fundamentalists, these skeptics believe that people and organizations which have different beliefs and values are a threat that must be vigorously fought and deserve ridicule and hostility. "Feelings of threat, hostility, and lack of respect for those with different beliefs and values are prominent with both fundamentalists and extreme skeptics" (Kennedy, 2003c, p. 30).

Skeptical writers generally view science as authoritative and consider religious and paranormal beliefs as indicating an immature stage of cognitive development that is in opposition to rational scientific theories (e.g., Kurtz, 2001; Schumaker, 1990; Vyse, 1997; Zusne & Jones, 1989). This perspective implies superiority of the skeptics and is based on philosophy and personal values that may reflect temperament and are far outside the domain of established scientific evidence.

## Superiority Without Authority and Dominance

Religion and spirituality can also provide a sense of self-worth and superiority for those who do not have social status and dominance.

Baumeister (1991) pointed out that the religions of slaves typically glorified meritorious rewards in an afterlife and punishment of oppressors. Glorification of rewards in the afterlife and of austere living in the present are also apparent in the religions of the less affluent whereas the religions of the more affluent tend to view material success in the present world as blessings from God (Roberts, 1995).

More subjective forms of spirituality can also provide a means for establishing a hierarchy of superiority. Characteristics and criteria for determining who is more spiritually advanced are often proposed (e.g., White, 1972; Wilber, 2000). The claim that one is among a small minority of highly evolved people and that everyone should strive to be like him or her is a common symptom of the drive to achieve a sense of superiority.

Certain religious traditions have included the belief that the occurrence of miracles was a sign of divine favor or of the holiness of those involved (Mullin, 1996). In addition, mystical or transcendent experiences have been widely interpreted as evidence of high spirituality and sought through practices such as meditation (Kornfield, 2000; Spilka et al. 2003, pp. 259-263, 297-298).

Psi experiences are sometimes presented as associated with an advanced state of spiritual development (Grosso, 1992; Murphy, 1992; Ring, 1984; Thalbourne, in press). Traditional yoga writings similarly proposed that paranormal abilities are associated with developing spirituality (Prabhavananda & Isherwood, 1981). Gopi Krishna (1974) claimed that his kundalini experiences (which resembled a mental health breakdown) made him a highly evolved "genius" and gave him psychic powers. However, that appears to have been a self-evaluation with no objective or tangible evidence to support his high opinion of himself.

It is now widely recognized that the occurrence of transcendent and related experiences do not necessarily indicate ethical behavior, compassion, wisdom, integration, or other characteristics normally associated with spirituality (Kornfield, 2000; Zweig, 2003). In fact, the sense of superiority from such experiences may promote self-serving abuse of power. The most conspicuous evidence for this point comes from the numerous cases of spiritual leaders who claim many transcendent experiences but have a lavish lifestyle and use their position of authority for sexual activity with people they are supposedly spiritually guiding. Sexual exploitation has happened much more widely than is generally acknowledged in both eastern and western spiritual organizations (Gonsiorek, 1995; Kornfield, 2000; Neimark, 1998; Roemischer, 2004; Zweig, 2003). Such behavior appears to have occurred in the majority of prominent yoga and meditation organizations in the U.S. As discussed in the references above, the sexual exploitation has resulted in numerous lawsuits, but even when consensual, it still appears to be an abuse of authority and trust. In an important discussion of the realities of spiritual pursuits, Kornfield (2000) described the common error of mistaking charisma for wisdom.

## Summary

Some people build superiority hierarchies in the material world and some build them only in their minds. Those who build superiority hierarchies in the material world tend to have more negative attitudes toward the paranormal. Paranormal and mystical experiences may sometimes be pursued or claimed in an effort to achieve a sense of superiority. Tensions between people with authoritarian and transcendent dispositions have occurred throughout history and appear to underlie many religious and social conflicts.

# THE MOTIVATION FOR CONNECTEDNESS

For some people, belief in psi may be motivated more by a need for a sense of interconnectedness rather than for control and superiority. Social connections and support are one of the widely recognized functions of religion (Spilka et al. 2003). Women, in particular, tend to value social and emotional connections (Campbell, 2002; Geary, 1998; Gilligan, 1993). Religious, supernatural, or paranormal beliefs may be held primarily to fit into a social group or organization. Alternatively, the beliefs themselves may reflect and reinforce the motivation for interconnectedness. Blackmore (1994) noted that belief in psi may be more common among women because of their greater sense that the world is interconnected. White (1997b), Braud (1997), and Tart (2002) have discussed the sense of interconnectedness that results from psi experiences.

The relationship between interconnectedness and transcendence merits investigation. Deacon (1997) suggested that humans evolved an innate motivation to become part of something larger than oneself. This motivation promotes social organization. Deacon also suggested that this motivation, combined with a propensity to find meaning or symbolic relationships in all experiences, underlies mystical or religious beliefs.

People with a strong sense of connection may view the world as an interconnected whole that is meaningful and benevolent. These views are similar to the "assumptive worldviews" that initial research suggests may be related to belief in paranormal phenomena (Irwin, 2003). This holistic worldview may also lead to altruism because the world is not divided into an in-group versus outsiders.

## THE HEALING FACTOR

McClenon (1994, 2002) proposed that paranormal demonstrations and beliefs promote healing through placebo and hypnotic effects. He argued that these healing benefits may have been the foundation for the evolution of religion and paranormal beliefs. He also noted that these benefits apply even if psi effects are not real, and that deception has been widely practiced to induce such beliefs.

Schumaker (1995) similarly argued that transcendent myths and religious beliefs are important for mental health. He proposed that the decline in the role of religion in culture has greatly hindered the ability for mental health healing and that a new balance between myth and reality needs to be found. This appears to be a change from his earlier view that paranormal and religious beliefs were driving humanity down a road of irrational self-destruction (Schumaker, 1990).

These ideas are closely related to the motivation for efficacy and control. Placebo effects are basically self-healing by the body. It has long been thought that expectation has a major role in placebo effects (Hyland, 2003; Shapiro & Morris, 1978; White, Tursky, & Schwartz, 1985). Certain modern medical practices may reduce expectations. In particular, legal obligations for full disclosure and informed consent can be expected to reduce optimism and expectations. The circumstances of psychic, spiritual, or alternative healing techniques may optimize self-healing in ways that are difficult to achieve in the standard medical profession.

However, placebo effects have always been controversial. After decades of research and experience, some investigators question whether placebo effects exist at all (e.g., Hrobjartsson & Gotzxche, 2001). Placebo effects and their relationship to other variables are inconsistent and unpredictable, even when procedures and subject populations are as similar as possible (Hyland, 2003; Shapiro & Morris, 1978). Conditions for reasonably reliable results have not been identified. Hypnosis also has a long history of controversy, including whether it actually exists and whether responses to suggestion are primarily limited to individuals with certain personality characteristics, notably fantasy proneness (Baker, 1990; Spanos & Chaves, 1989).

The controversies about placebo and hypnotic effects raise questions about whether they are sufficiently powerful to have the role in evolution McClenon proposed. It may be difficult to distinguish the evolutionary role of healing beliefs from other factors such as the motivations for meaning and purpose, efficacy, and superiority. It is also possible that healing beliefs have a role primarily for certain personality types, such as fantasy proneness.

Placebo effects have many parallels with psi effects. Both have inconsistent experimental results and controversy about whether the effects are real. The mechanisms of action for both effects are not known, resulting in negative definitions based on what they are not rather than what they are. Also, the initial research efforts on placebo effects were focused on identifying the characteristics of certain individuals who were "reactors"; however, those efforts were not sufficiently successful to maintain the interest of researchers (Shapiro & Morris, 1978; White, Tursky, & Schwartz, 1985), which is similar to the experience with efforts to identify special subjects for psi experiments (Rao, 1965).

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Despite their similar properties, placebo effects have become much more widely accepted among scientists than psi effects. In fact, controlling for possible placebo effects is a standard design criterion for medical research. A more comprehensive comparison of the characteristics and scientific acceptance of placebo and psi effects might be revealing.

# FEAR OF PSI

The usual explanations in parapsychology for the inability to obtain reliable psi effects involve speculations about unconscious, instinctive fear of psi (e.g., Batcheldor, 1984; Braude, 1997; Ehrenwald, 1978; Eisenbud, 1992; Radin, 1989; Tart, 1984) and suppression of psi to prevent information overload (e.g., Bergson, 1914; Ehrenwald, 1978; Koestler, 1972).

However, the widespread interest in psi and the extensive efforts of some people to cultivate psi abilities are not consistent with these speculations about fear of psi. It may be true that some people fear psi, but there is strong evidence that many others do not, and, in fact, some people desire to develop useful psi abilities, as evidenced by the perpetual popularity of books and courses on developing psi abilities (e.g., Robinson & Carlson-Finnerty, 1999) and the continuing existence of commercial psychics. Similarly, the speculations about information overload overlook the fact that instances of striking psi occur without information overload. These speculations do not explain why instances of striking psi do not occur more frequently and with greater control.

The speculations about fear and information overload, combined with the unreliable, unuseful nature of psi effects, imply that psi has more adverse effects than benefits. Experimental parapsychology assumes that psi is a widespread human ability; however, psi would not be expected to evolve as a human ability if it caused substantial adverse effects and little benefit.

The arguments about unconscious fear of psi have direct spiritual assumptions that are rarely acknowledged. Given the implausibility of evolution producing an ability that has the characteristics of psi, one possibility is that the source of psi is supernatural or external to living people. The instinctive propensity to fear snakes (Tallis, 2002, pp. 135-138) provides a useful comparison. Such instinctive fears make sense for reacting to external threats like snakes but do not offer a rationale for the evolution of an ability that appears to have negligible material benefit and serious adverse effects that need to be suppressed. Following this line of thought, an instinctive fear of psi would imply that the source of psi is external to people. Alternatively, psi could be a pre-existing, innate spiritual ability that is detrimental in the material world, as suggested by Bergson (1914). Either of these approaches identifies psi with a dualistic spiritual realm rather than as a human ability that emerged through evolution.

In terms of motivations, the lack of control of psi is the main theme emerging from empirical findings on fear of psi (Siegel, 1986; Tart, 1986; Tart & Labore, 1986). The need for research on various aspects of the motivation for control and attitude toward psi was noted earlier. Given the human need for control, fear of psi is probably a result of the lack of control rather than a cause, which is contrary to the rationale that fear causes psi effects to be unreliable.

#### CONCLUSIONS

The efforts to achieve control of psi in experimental parapsychology have not produced significant scientific progress. When psi phenomena are examined without the implicit bias for control, the relationship with spirituality emerges as the central organizing factor. The primary effect of psi experiences appears to be enhanced spirituality and meaning in life. Reliable use of psi for material self-interest in a manner that is scientifically convincing has not occurred and, at this point, does not seem likely.

It is not surprising that those who are by disposition materialistic, pragmatic, and rational find the evidence for psi not to be remotely convincing. If psi phenomena had a degree of predictability and usefulness, the scientific community could assign a label to the unknown process and begin developing methods for its control and practical application. That would not be noticeably different from the situation with the established physical forces. People with pragmatic, materialistic values cannot be expected to be interested in something that has no pragmatic, materialistic use.

People more attracted to transcendence continue to have experiences that they describe as providing absolutely certain knowledge that there is a spiritual realm (James, 1902/1982; Miller & C'de Baca, 2001; Ring, 1984). These people find substantial commonalities among their experiences and the after-effects. The fact that others with more externally focused, materialistic dispositions do not have such experiences and are skeptical is irrelevant to the interpretation of their experiences. They feel that they are dealing with direct experience and knowledge, not philosophical theories, academic rationalizations, or speculations. As William James (1902/1982) noted, there is no point in trying to convince them that their experiences are not real.

Paranormal and mystical experiences have several characteristics in common, including the ability to inspire a sense of meaning and purpose in life. Science, on the other hand, is often described as fulfilling the needs for control and efficacy but not the needs for meaning, purpose, values, and self-worth. However, this perspective may not fully take into account the diversity of motivations associated with different personality types. Some people may find meaning and purpose from scientific understanding, others from transcendent experiences, and others from enforcing the authority of tradition.

Objective scientists must recognize that they cannot prove scientifically that reports of subjective transcendent experiences do not have

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some validity that is beyond current scientific understanding. Paranormal phenomena that are viewed as miracles initiated by supernatural powers to inspire spiritual growth are largely outside the domain of science, as are many other religious beliefs. The extent to which attitudes toward such matters are based on personal dispositions rather than scientific knowledge deserves recognition.

Tensions among those with transcendent, authoritarian, and scientific dispositions have been common in the history of paranormal and religious beliefs. The motivation for superiority is not limited to authoritarian personalities and can contaminate both science and spirituality. This motivation can prevent proponents of science from being objective and rational, and it can prevent proponents of spirituality from being compassionate and ethical. The aggressive promotion of a particular belief system can be a form of competition and dominance similar to sports. Such aggressiveness can be seen on both sides of psi beliefs but is particularly strong for some of the skeptics. Persons on each side can see the irrational drive for superiority in their opponents, but they have difficulty acknowledging it in themselves.

Science can do much to sort out the web of motivations and to create better understanding among people with different dispositions. The ideas presented here provide a plausible beginning and have some initial empirical support.

A useful next step would be to develop measures that address various factors, including motivations for transcendence, connectedness, control and efficacy, superiority, authority, and healing. Measuring exposure to basic social and cultural factors related to belief in the paranormal would also be useful, particularly for identifying people who do not have strong personal motivations and tend to go along with social and cultural influences. The mix of factors could be characterized for an individual and for different types of paranormal experiences and beliefs. For example, it would be useful to measure the mix of factors associated with (a) experiences that could be actual psi, (b) experiences that appear to be misinterpreted as psi, and (c) skepticism about psi. The motivation for superiority, in particular, has been underappreciated in research, perhaps because many scientists prefer to overlook that aspect of their own personality.

Exploring factors of humility and gratitude versus efficacy and superiority may be particularly valuable. The tangible lesson from the failure to develop useful applications of psi is that motivations for efficacy and superiority may not be applicable in this domain. Successful research strategies in this area must identify and adapt to the properties of the phenomena. The evidence for psi and its association with transcendent experiences may hint that there is a spiritual realm that tentatively encourages development in a transcendent, humble, non-self-serving, nonmaterialistic direction.

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# APPENDIX

# SUMMARY OF THE MYERS-BRIGGS PERSONALITY MODEL

The Myers-Briggs personality model (Keirsey, 1998; Myers & McCaulley, 1985; Myers & Myers, 1995) was developed for practical use in occupational settings and interpersonal relationships, and has been widely used in those contexts for several decades. The magnitude of the genetic component is similar to that of other personality models (Bouchard & Hur, 1998).

The Myers-Briggs model utilizes 16 personality categories based on the combinations of four factors. The summary below was taken from Keirsey (1998), whose concepts are largely the same as the original Myers-Briggs model but more clearly separate the E/I and S/N factors that conceptually overlap in the original model.

*Extraverted/introverted* (E/I) indicates whether a person feels energized (E) or drained (I) from being with a group of people;

Sensing/intuitive (S/N) indicates whether a person focuses his or her awareness and attention more on the external, material world and prefers concrete, observable facts (S) or focuses internally on the self and imagination and prefers abstract ideas (N);

Thinking/feeling (T/F) indicates whether a person tends to value rational thinking and self-control (T) or emotional expression (F);

Judging/perceiving (J/P) indicates whether a person prefers setting and achieving goals and having a sense of closure (J) or spontaneously exploring open-ended possibilities and keeping options open (P).

For example, ESTJ is one personality type and the most different type from that is INFP.

The primary difference between the sexes in personality types is on the T/F factor. About two-thirds of males are T (thinking) and about two-thirds of females are F (feeling) for U.S. data (Macdaid, McCaulley, & Kainz, 1986).

The Myers-Briggs model describes all personality types as being valuable in some circumstances. Presumably, the different personality types have been maintained throughout evolution because they had adaptive value or at least did not inhibit reproductive success. This positive approach may be a significant reason for the widespread use of the Myers-Briggs test in occupational settings. Most personality models have factors that measure neuroticism or similar negative traits that imply a superiority/inferiority ranking of people. When organizations are experiencing tensions between departments that tend to have people with different personalities (e.g., between a sales-marketing group and a data processing group), joint meetings that discuss the existence and value of different personalities may be helpful. However, interjecting a dimension of superiority is counterproductive and inappropriate in these situations. The Myers-Briggs model works well in such cases. The Myers-Briggs model has been subject to criticism because it was developed over 50 years ago by persons without academic credentials and without fully utilizing the methods and theories of academic psychology (e.g., Pittenger, 1993). The fact that the model is based on types (categories) rather than traits (continuous measures) is one of the more tangible technical criticisms.

A review and meta-analysis of a large number of reliability and validity studies concluded that the Myers-Briggs test performed well and was comparable with other personality tests (Harvey, 1996). In addition to convergent, divergent, and predictive validity, the studies included confirmatory factor analyses. To my mind, the best indication of the validity of a psychological test is useful, practical application for real-world behavior. In that regard, the Myers-Briggs model has good standing because it has been widely used in organizational settings for decades. In addition, consistent, meaningful research results, including studies with large, noncollege student samples, provide further evidence for the usefulness of the Myers-Briggs test (Hammer, 1996; Kroeger, Thuesen, & Rutledge, 2002; Macdaid, McCaulley, & Kainz, 1986). The fact that it may not be fully optimal from an academic, mathematical perspective (e.g., types versus traits) does not mean that it lacks useful validity and reliability.

Although the Myer-Briggs test has been the most frequently used general personality test in research on paranormal and related beliefs, it would be useful to carry out research with other personality models. As noted in the conclusion, the optimal strategy for research on the role of personality in paranormal beliefs may be to develop personality tests that directly measure certain personality factors, including mystical, authoritarian, and scientific dispositions. The value of such a personality test may apply beyond paranormal beliefs and may be helpful for understanding many conflicts among people.

# PARANORMAL BELIEF AND RELIGIOSITY

BY ANDREAS HERGOVICH, REINHARD SCHOTT, AND MARTIN ARENDASY

ABSTRACT: The findings of past research on the relationship between paranormal belief and religiosity are inconclusive. The aim of this study was to examine the relationship based on a sample from Austria and also with respect to different aspects of paranormal belief as well as religious belief. A sample of 596 students completed a measure of paranormal belief and a questionnaire on various indices of religiosity. The results revealed rather low but significant correlations between paranormal belief and religiosity. Intrinsic religiosity and self-reported religiosity were much more strongly related to paranormal belief than was extrinsic religiosity. For subjects without religious affiliation, the relationship between religiosity and paranormal belief was higher than for Catholics and Protestants. These results suggest a modified version of the substitution hypothesis indicating that paranormal belief can be, but must not necessarily be, a substitute for traditional religion.

A number of studies have examined the relationship between paranormal belief and religiosity. In accordance with the hypothesis that paranormal belief functions as a substitute for religious belief, some authors have reported a negative relationship between paranormal belie and measures of religious belief (Emmons & Sobal, 1981; Persinger Makarec, 1990; Beck & Miller, 2001). However, this negative relationshi could also be interpreted as a manifestation of rejection of at least some paranormal beliefs (precognition and superstition) by the Catholic Church (Goode, 2000; Sparks, 2001). In contrast to the substitution theory, there exists the hypothesis that people who believe in angels or wondrous healings also believe in other paranormal phenomena such as ghosts and voodoo (Irwin, 1993; Rice, 2003). Thus, the paranormal is undoubtedly a common characteristic of both religion and parapsychology, although in our times the paranormal is probably losing its importance in most religions. Related to the fact that the paranormal is common to religion and parapsychology is the theory of a common worldview (Zusne & Jones, 1989). Religiosity and paranormal belief imply a belief in the existence of phenomena that currently cannot be explained by science, be it phenomena such as psi (extrasensory perception and psychokinesis) or the belief in life after death or God. The acceptance of these phenomena allows the believer to have a different worldview, one that shows the world as being more humane and having greater meaning. Such an animistic world does not obey mechanical scientific laws and is not reducible to materialism. In line with this reasoning, some studies indicate a rather small (around r = .20) but positive relationship between both constructs (Haraldsson, 1981; Irwin, 1985; Goode, 2000). Thalbourne (2003) even

describes the substitution theory as an "urban myth" because in seven out of nine studies he found positive correlations between paranormal belief and religiosity (the coefficients were between r = .20 and r = .55). For a German sample, Thalbourne and Houtkooper (2002) reported a correlation of r = .54 between the Australian Sheep-Goat Scale and religiosity.

Orenstein (2002) concluded that past studies could not clearly show whether religious belief is related positively, negatively, or not at all to paranormal belief.

A study by Thalbourne and O'Brien (1999) on Australian participants shows that the direction of the relationship may depend on the measurements selected. They obtained an almost significant negative correlation (r = -.17) between the Australian Sheep-Goat Scale (Thalbourne & Delin, 1993) and the Religion-Puritanism Scale from the Wilson-Patterson Attitude Scale (Wilson, 1975), a correlation close to zero with the subscale traditional religiosity (r = .07) from the Paranormal Belief Scale (PBS, Tobacyk & Milford, 1983), and a significant and positive coefficient with the religiosity scale of Haraldsson (derived from Haraldsson, 1981).

Another reason why the previous results for the relationship between religious belief and paranormal belief are difficult to compare or generalise is the heterogeneity of the samples that were examined. he samples differ not only with respect to ethnicity or nationality but lso, most importantly for this question, with respect to their religious affiliation. For example, in the study by Thalbourne and O'Brien (1999), the sample consisted mainly of Protestants; in a study by Thalbourne and Hensley (2001), which reported a correlation of .30 between a religiosity scale and the Icelandic Sheep-Goat Scale (Haraldsson, 1981), nearly one third of the subjects from Washington University in St. Louis were Jewish, Protestant, and Catholic, respectively. Other studies do not include information concerning the religious affiliation of their sample, although in some instances it can be guessed (e.g., Beck and Miller, 2001, who found a negative relationship between paranormal belief and religiosity, hinted that they recruited their subjects from a "Christian affiliated institution"). Thalbourne and O'Brien (1999) analysed the influence of current religious affiliations and showed that, aside from Spiritualists, participants without religious affiliation had the highest belief in the paranormal.

One aim of the current study was to assess the relationship between religiosity and paranormal belief in a larger sample from Austria, controlling for religious affiliation. The larger sample was used to ensure that the different religious affiliations were represented, although it is clear that in Austria, with its largely Catholic society, we would not get an equal number of participants with a random sample. The other purpose was to include not only different aspects of paranormal belief but also different aspects of religious belief, such as intrinsic religiosity and extrinsic religiosity, as was suggested by Sparks (2001). We had not derived specific hypotheses for all variables investigated, but generally we assumed that for participants without religious affiliation the relationship between intrinsic religiosity and quest on the one hand and paranormal belief on the other hand would be higher than for participants with religious affiliation.

#### METHOD

# **Participants**

A total of 596 participants were selected for this study. They were 422 (70.8%) female and 174 (29.2%) male students from two universities in Vienna: the Technical University (n = 126) and the main University of Vienna (n = 470, of whom the majority, 64.8%, were psychology students). The mean age of the total sample was 22.29, ranging from 18 to 65 (with a standard deviation of 6.12). With respect to religious affiliation, 421 participants (70.6%) were Catholic; 92 (15.4%) were without religious affiliation; 53 (8.9%) were Protestant; 20 (3.3%) were unspecified, other, or single denominations (Taoist, Buddhist, Adventist, etc.); and 10 (1.7%) Moslem.

# Procedure

All participants completed a questionnaire containing the PBS (Tobacyk & Milford, 1983), the Intrinsic/Extrinsic Religiosity Scale of Gorsuch and McPherson (1989) and the scale "quest" by Batson and Schoenrade (1991) in German translation (Kupper & Bierhoff, 1999). The PBS assesses paranormal belief across a wide domain, including the subscales traditional religious belief (e.g., "There is a devil"; "There is heaven and hell"), psi (e.g., "A person's thoughts can influence the movement of a physical object"), witchcraft (e.g., "Black magic really exists"; "There are actual cases of death from Voodoo"), superstition (e.g., "Black cats can bring bad luck"; "If you break a mirror, you will have bad luck"), spiritualism (e.g., "It is possible to communicate with the dead"; "Reincarnation does occur"), extraordinary life forms (e.g., "The Loch Ness monster of Scotland exists"; "Big Foot exists"), and precognition (e.g., "Some people have the ability to predict the future"). The scale consists of 25 items that are assessed on a 5-point scale. The scale intrinsic religiosity is supposed to measure religiosity from inner conviction with 8 items on a 9-point Likert scale (sample item: "It is important for me to devote time to personal thoughts and prayers"). Extrinsic religiosity has an instrumental function as a source of well-being and consolation and is measured with 6 items on a 9-point Likert scale (sample item: "I go to church mainly to meet people I like"). Quest measures the degree to which participants pose to themselves existential questions. The quest scale consists of 12 items that are assessed on a 9-point Likert-scale (sample item: "I persistently scrutinize my own religious convictions").

Moreover, the sample was asked to specify socio-demographic variables (age, sex) and attendance at church/religious gatherings. The questionnaire also contained two single questions on 5-point Likert Scales with regard to religious belief and paranormal belief ("How religious would you describe yourself as being?" and "Do you believe in paranormal phenomena?").

#### RESULTS

First, descriptive statistics and reliabilities of the scales were calculated. The mean of the PBS was 71.01 (SD = 19.17) with a range from 25 to 121. The internal consistency (Cronbach's Alpha) of the PBS was .91 for the whole sample. For the quest scale the mean was 59.47 (SD = 17.33) with a range from 20 to 101. The internal consistency for quest was .83. Intrinsic religiosity had a mean of 30.93 (SD = 13.21) with a range from 8 to 70. Cronbach's Alpha was .81. For extrinsic religiosity the mean of the scale was 17.15 (SD = 7.93), ranging from 6 to 43. The internal consistency was .70. The correlations between the scales of religiosity (intrinsic religiosity, extrinsic religiosity, quest, and traditional religiosity of the PBS) were not significant except for the correlations between traditional religiosity and quest, r (594) = .52, p < .01, and between traditional religiosity and quest, r (594) = .23, p < .01. For all variables, the assumption of normality was satisfied, because the skewness of all variables was under 2 and the kurtosis under 7 (Curran, West, & Finch, 1996).

A multivariate analysis of variance (MANOVA), with religious affiliation (which contained only groups with a sufficient number of people in our sample, i.e., Protestants, participants without religious affiliation, and Catholics) as the independent variable, and the subscales of the PBS (without traditional religious belief) as dependent variables, was calculated. Although BOX M's Test of multivariate normality was significant and the number of participants in the groups was highly unequal, Mardia's test (DeCarlo, 1997) was not significant, suggesting that the violations are not extreme. As a precaution, following the argumentation of Stevens (1996), we selected the interpretation of the Pillai-Bartlett trace because of its greater robustness against violations of the assumptions of multivariate normality (Stevens, 1996). The results of the MANOVA revealed no significant differences between the different religious affiliations, F(12, 1112) = 1.21, p > .05.

Next, correlations between measures of religious belief and paranormal belief were computed for the total sample (Table 1).

SAMPLE $(N = 590)$								
Quest	Intrinsic	Extrinsic	Religiosity	Church	Tradit			
5**	.12**	.06	.20***	04	.43***			
12**	.10*	.03	.18***	02	.35***			
10*	.09*	.02	.13**	05	.31***			
)4	.05	.10*	.07	.01	.25***			
6***	.11*	.04	.21***	04	.38***			
)6	.04	.07	.06	01	.20***			
3**	.13**	.04	.15***	02	.33***			
)7	.14**	.05	.22***	03	.37***			
	Quest 5** 2** 0* 04 6*** 06 3** 07	Quest         Intrinsic           5**         .12**           2**         .10*           0*         .09*           04         .05           6***         .11*           06         .04           3**         .13**           07         .14**	Quest         Intrinsic         Extrinsic           5**         .12**         .06           2**         .10*         .03           0*         .09*         .02           04         .05         .10*           6***         .11*         .04           06         .04         .07           3**         .13**         .04           07         .14**         .05	QuestIntrinsicExtrinsicReligiosity5**.12**.06.20***2**.10*.03.18***0*.09*.02.13**04.05.10*.076***.11*.04.21***06.04.07.063**.13**.04.15***07.14**.05.22***	QuestIntrinsicExtrinsicReligiosityChurch5**.12**.06.20***042**.10*.03.18***020*.09*.02.13**0504.05.10*.07.016***.11*.04.21***0406.04.07.06013**.13**.04.15***0207.14**.05.22***03			

TABLE 1 Correlations Between Religiosity and Paranormal Belief for the Total Sample (N = 596)

\**p* < .05,\*\**p* < .01,\*\*\**p* < .001

*Note.* PBS\_w: PBS total score without the traditional religiosity subscale; Belief: single question regarding paranormal belief; Church: frequency of attendance of church/religious gatherings; Religiosity: single question regarding religiosity; Tradit: traditional religiosity.

As can be seen, paranormal belief has substantial correlations with self-reported religiosity (single question: "How religious would you describe yourself as being?"). The correlation with the total score of the PBS (without traditional religious belief) amounted to r (594) = .20, p < .001, and the correlation with self-reported paranormal belief was r (594) = .22, p < .001. For the PBS, the highest coefficients were found with the subscales psi and spiritualism. Even higher correlations were recorded between traditional religious belief (as part of the PBS) and the other PBS subscales.

 Table 2

 Multiple Correlations Between Religiosity Indices and Paranormal Belief

 for the Various Religious Affiliations (N= 566)

	Quest	Intrinsic	Extrinsic	Religiosity	Church	Tradit
Protestants	.24	.30	.40	.27	.28	.57*
Without	.38	.43*	.16	.41*	.15	.60***
Catholics	.14	.19*	.12	.26***	.11	.46***
*p < .05, **p < .01, ***p < .001						

*Note.* The multiple correlations result from regression analyses with each index of religiosity as criterion and all subscales of paranormal belief as predictors. Church: frequency of attendance of church/religious gatherings; Religiosity: single question regarding religiosity; Tradit: traditional religiosity.

Multiple correlations between the different indices of religiosity and all aspects of paranormal belief revealed interesting results. (In Table 2, notice that the multiple correlations give no information on the direction of the relationship, as the coefficients are necessarily positive.)

Not surprisingly, the relationship of paranormal belief to traditional religiosity (which is part of the PBS) is the highest, and this is true for all religious affiliations. For people without religious affiliation, paranormal belief seems to be related to self-reported religiosity and intrinsic religiosity (both coefficients are significantly higher than those of Catholics, p < .05; the statistical comparison of the correlations follows Clauss & Ebner, 1982). For Protestants, on the other hand, the relationship with extrinsic religiosity is stronger than for Catholics, multiple R (566) = .40 versus R (566) = .12, p < .05. Apart from that, no differences are significant.

Regression analyses further clarified the type of relationship between paranormal belief and religiosity with respect to religious affiliation. For the regression analyses the criterion was the total score of the PBS (without traditional religiosity). Predictors were self-reported religiosity, church attendance, quest, and intrinsic respectively extrinsic religiosity. For the total sample (n = 590), only self-reported religiosity (Beta = .24, p < .001) and church attendance (Beta = .17, p < .01) were significant predictors of paranormal belief, R(584) = .26,  $R^2 = .067$ , Durbin Watson = 1.84. For Catholics (n = 419), as can be expected, the results were quite the same (self-reported religiosity and church attendance were the only significant predictors of paranormal belief). For Protestants (n = 52), self-reported religiosity (Beta = .53, p < .01) and intrinsic religiosity (Beta = -.59, p < .01) were significant predictors of paranormal belief, R(46) = .51,  $R^2 = .26$ , Durbin Watson = 2.26, with intrinsic religiosity negatively related to paranormal belief. In contrast, for participants without religious affiliation (n = 91), intrinsic religiosity was the only, although positively related, significant predictor of paranormal belief: Beta = .35, p < .05, R(85) = .45,  $R^2 = .20$ , Durbin Watson = 2.14.

	Quest	Intrinsic	Extrinsic	Religiosity	Church	Tradit
PBS_w	.11*	.14**	.07	.20**	02	.45***
Psi	.12*	.13**	.04	.21**	.00	.36***
Witchcraft	.08	.07	.01	.11*	07	.31***
Superstition	.01	.00	.12*	.04	.02	.26***
Spiritualism	.13**	.15**	.04	.22***	-01	.41***
ExtraLife	.03	.02	.06	.07	.01	.21***
Precognition	.10*	.17**	.03	.14**	.00	.30***
Belief	.10*	.16**	.03	.23***	04	.35***

TABLE 3

Correlations Between Religiosity and Paranormal Belief for Catholics (N = 421)

\*p < .05, \*\*p < .01, \*\*\*p < .001

			(N = 53)			
	Quest	Intrinsic	Extrinsic	Religiosity	Church	Tradit
PBS_w	.04	21	.17	.18	07	.59***
Psi	.10	17	.07	.10	03	.53***
Witchcraft	.01	17	.12	.16	11	.52***
Superstition	.09	07	.03	.08	.01	.18
Spiritualism	.02	15	.12	.22	07	.57***
ExtraLife	.04	10	.35*	01	.00	.33*
Precognition	10	23	.09	.15	11	.48***
Belief	01	05	.08	.12	04	.48***
		O I skalesk	0.01			

TABLE 4 Correlations Between Religiosity and Paranormal Belief for Protestants (N = 53)

\*p < .05, \*\*p < .01, \*\*\*p < .001

TABLE 5 CORRELATIONS BETWEEN RELIGIOSITY AND PARANORMAL BELIEF FOR SUBJECTS WITHOUT RELIGIOUS AFFILIATION (N=92)

	Quest	Intrinsic	Extrinsic	Religiosity	Church	Tradit
PBS_w	.23*	.42***	.13	.39***	.01	.58***
Psi	.12	.25*	.05	.29**	.04	.44***
Witchcraft	.17	.35**	.11	.27*	.03	.49***
Superstition	.10	.21	.05	.22*	.01	.31***
Spiritualism	.21	.36***	.12	.39***	.02	.54***
ExtraLife	.04	.32**	.09	.18	.05	.27**
Precognition	.27**	.24*	.05	.28**	04	.50***
Belief	.03	.28**	.03	.27*	.07	.47***
Sector Se						

\**p*<.05,\*\**p*<.01,\*\*\**p*<.001

*Note.* PBS\_w: PBS total score without traditional religiosity subscale; Belief: single question regarding paranormal belief; Church: frequency of attendance of church/religious gatherings; Religiosity: single question regarding religiosity; Tradit: traditional religiosity.

Tables 3-5 show in detail the correlations between the different aspects of paranormal belief and religiosity for Catholics, Protestants, and participants without religious affiliation, respectively.

Because the sample size was greater, many coefficients for the Catholics are significant. Nevertheless, apart from traditional religiosity (which possibly reflects response style, because these items were provided within the questionnaire concerning paranormal belief), the relationship between religiosity and paranormal belief seems not to be very high for Catholics and Protestants. Confirming the results of the regression analyses, for Protestants paranormal belief is to some extent negatively related to intrinsic religiosity, and for participants without religious affiliation it is the opposite. Participants without religious affiliation also reveal the highest relationship between paranormal belief and intrinsic religiosity as well as with self-reported religiosity. The correlation of the total score of paranormal belief with intrinsic religiosity is r (90) = .42, p < .001 and with self-reported religiosity, r (90) = .39, p < .001. Naturally, church attendance or extrinsic religiosity plays no role for them.

In short, a moderate positive relationship was found between paranormal belief and religiosity. The relationship was much stronger for indices such as intrinsic religiosity or self-reported religiosity than for measures of extrinsic religiosity (which show no correlations with paranormal belief). If one compares the different religious affiliations, the relationship between paranormal belief and religiosity is much higher for participants without religious affiliation than for Catholics and Protestants. (Protestants even show a negative relationship to paranormal belief, which means the higher the intrinsic religiosity of Protestants, the lower is the paranormal belief.) For these participants, intrinsic religiosity and selfreported religiosity were, above all, strongly related to paranormal belief.

# DISCUSSION

Studies previously undertaken to examine the relationship between religiosity and paranormal belief have already been able to establish some evidence of a positive relationship between these two constructs. The aim of the current study was to consider different aspects of religiosity as well as different aspects of paranormal belief. Another aim was to compare the results with regard to religious affiliation. In contrast to some studies (Beck & Miller, 2001; Emmons & Sobal, 1981), our results suggest an overall positive relationship between traditional religiosity and the other subscales of the PBS among Austrian students, especially with belief in psi, spiritualism, and precognition, confirming the results of Haraldsson (1981). Therefore, we conclude, contrary to Thalbourne and O'Brien (1999), that the association between paranormal belief and religiosity is not restricted to Iceland. However, it is necessary to exercise caution in interpreting this result, as the high correlations among all subscales of the PBS could also indicate the presence of answering in accordance with response style. Aside from these results, for the entire sample, paranormal belief is mainly related to self-reported religiosity (this is in line with Thalbourne & Hensley, 2001) and to some extent also with the quest scale. However, for Catholics the relationship to paranormal belief is small, as it also is for Protestants, who even exhibit a negative correlation between

intrinsic religiosity and paranormal belief. Although participants without religious affiliation report themselves as less religious, and although they have the lowest values on all the religiosity scales (note, however, that only extrinsic religiosity is significantly lower in comparison to Protestants and Catholics), if they do believe in paranormal phenomena to some extent, this belief is accompanied by religiosity (primarily intrinsic religiosity). These results concerning the participants without religious affiliation are partly in accordance with the hypothesis that paranormal belief functions as a substitute for religious belief (Persinger & Makarec, 1990; Thalbourne & O'Brien, 1999).

Perhaps past inconclusive results with respect to the relationship between paranormal belief and religion can be explained by the fact that most researchers either report correlations to support the thesis of a relationship between paranormal belief and religiosity (such as Thalbourne & Brien, 1999; Thalbourne & Hensley, 2001) or they report differences between religious and nonreligious participants (such as Williams, Taylor, & Hintze, 1989), but not both of the analyses (Tobacyk & Pirttilae-Backman, 1992, are an exception). But from lower religiosity for believers in paranormal phenomena it does not necessarily follow that on average there is no relationship to paranormal belief. Thus, our results suggest a modified version of the substitution hypothesis: for participants without religious affiliation, paranormal belief is a possible substitute for traditional religion, and if they report themselves as religious they believe across the board in religion and the paranormal. But most of them believe neither in paranormal phenomena (as is the case of people with a religious affiliation) nor in a traditional religion; in all indices of religious belief, participants without religious affiliation have the smallest values. In any case, it can be assumed that people without religious affiliation do not differentiate much between the contents of the paranormal and those of religion.

The results of our study underline that it is necessary to compare different religious affiliations with regard to the relationship to paranormal belief. They also show that both religiosity and paranormal belief are multidimensional constructs that do not allow a simple answer to the question of whether paranormal belief and religious belief are related.

Although we believe that our results can be generalized to some extent, at least within Western societies, in some respects the validity of our results is restricted to young students in Austria, who, despite the country's predominantly Catholic history, nowadays live in a rather secularized cultural context and are not very religious in the traditional sense. It would be interesting to see whether these results also hold for highly religious people in the traditional meaning of the word. One other obvious limitation of our research is that the group with a different religious orientation was not of equal size to the others and that our sample did not contain enough people of other major religions (e.g., Jews, Moslems, or Buddhists). Further research is needed to accomplish this goal.

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# A PRELIMINARY SURVEY OF PARANORMAL EXPERIENCES WITH PSYCHOACTIVE DRUGS

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ABSTRACT: The occurrence of transpersonal experiences with psychedelic substances is well attested, and several surveys have consistently found a small relationship between paranormal experiences and the use of such drugs in general. Isolated investigations of experiences with specific drugs exist, but no surveys have systematically examined whether particular experiences relate to particular drugs. In an online survey, 139 respondents were recruited through parapsychology or psychedelic interest groups and completed a questionnaire detailing psychoactive drug-use behaviour and the frequency of occurrence of a number of paranormal, shamanic, and mystical type experiences. Patterns of drug-induced transpersonal experiences reported elsewhere were mostly corroborated, particularly the proclivity for telepathic experiences with cannabis, out-of-body experiences with ketamine, entity encounter experiences with N,N-dimethyltryptamine (DMT), and plant-spirit encounters with a host of psychedelic plants. Several small correlations were found between drug-use frequency and experience frequency with certain drug and experience types, particularly those termed mystical. As expected, alcohol and opiate/opioid-use did not correlate with any transpersonal experiences although. surprisingly, no sizable correlations were found for psi experiences and the use of any one type of drug, possibly due to the high rate of occurrence of psi experiences among both drug users and non-drug users with this particular sample.

Since the earliest anthropological reports began relating the traditional use of psychoactive plants with shamanism, witchcraft, and magic (e.g., see Schultes & Hofmann, 1992), there has been an association between such substances and paranormal phenomena. Following the discovery of the psychoactive effects of LSD by Albert Hofmann in 1943 and the subsequent boom in interest in so-called "psychedelic" substances, a body of anecdotal reports of paranormal experiences began surfacing among researchers (Luke, 2006) and, beginning in the 1950s, several experimental research projects were conducted to investigate the utility of psychedelic drugs in inducing ESP (for a review see Luke, in preparation). For the purpose of the present paper, a psychedelic drug is

one which, without causing physical addiction, craving, major physiological disturbances, delirium, disorientation, or amnesia, more or less reliably produces thought, mood, and perceptual changes otherwise rarely experienced except in dreams, contemplative and religious exaltation, flashes of vivid involuntary memory, and acute psychoses. (Grinspoon & Bakalar, 1998, p. 9) The dated medical term "hallucinogen" has not been favoured here because the clouded notion of hallucinations in relation to psychoactive drugs obscures far more than it explains (see Shannon, 2003). The term "paranormal," defying a good consensus definition, is here used to include a number of apparent phenomena beyond current scientific explanation that are commonly researched by parapsychologists—such as psi (ESP, psychokinesis), mediumistic communication, out-of-body experiences (OBEs), and near-death experiences (NDEs). Several apparent phenomena not so commonly investigated within parapsychology but which are of interest are also included here under this rubric—such as entity encounters, perception of auras, past-life experiences, and several mystical-type experiences.

Following political and legal sanctions in the industrialized nations, by the 1970s most experimental research with psychedelics had ceased whereas popular use of these substances continued, albeit illicitly. Consequently, research investigating the relationship between the use of these substances and the ostensibly paranormal has since been conducted largely through surveys, though often indirectly with psychoactive drug use as just one of many co-variables within surveys of paranormal experience.

Conducting a postal survey of paranormal experiences, Palmer (1979) created a questionnaire that included several items relating to drug use, which was randomly distributed within the state of Virginia. The questionnaire was subsequently adapted for use with members of the Association for Research and Enlightenment (Kohr, 1980) and Indian students (Usha & Pasricha, 1989a, 1989b). Palmer found a relationship between the reported use of "mind-expanding" drugs and being an ESP agent, having recurrent spontaneous psychokinesis (RSPK) and haunting experiences, having aura vision, and having OBEs, with some differences between the student and townspeople samples. The special sample surveyed by Kohr did not show any such relationship, most likely due to the diminished use of drugs among this group, whereas the Indian research found, similarly to Palmer, an association of drug use with ESP and OBEs, and additionally with apparitions and déjà vu. Furthermore, 18% of the Indian sample and 28-29% of the Virginian sample reporting the use of such drugs also had psi experiences while under their influence.

More recently, Kumar, Pekala, and Gallagher (1994) developed a drug-use scale to complement their measure of paranormal belief, ability, and experience, along with a measure of fear of the paranormal, which were combined to create the Anomalous Experiences Inventory (AEI). A number of subsequent surveys conducted exclusively with convenience samples of university students have consistently found a positive but weak correlation between the drug-use subscale and two of the AEI's other subscales, paranormal experiences (r = .13 to .29) and paranormal belief (r = .16 to .25) (Gallagher, Kumar, & Pekala, 1994; Houran & Williams, 1998; Pekala, Kumar, & Marcano, 1995a, 1995b; Simmonds & Roe, 2000;

Thalbourne, 2001). That these correlations were small, although significant, may be due in part to the generalized nature of the drug-use items in the AEI, which utilizes nominal yes-no answers rather than ordinal response categories. Additionally, the AEI drug-use subscale combines items relating to the use of heroin, cocaine, and alcohol, along with psychedelic drugs (LSD and marijuana). Yet, where the results were specified, the relationship between paranormal experiences and belief and the use of nonpsychedelic drugs was either negative or nonsignificant, or, where positive, was reduced in comparison to the positive relationship found with psychedelic drug use (Gallagher et al., 1994).

A handful of other surveys have targeted drug users as respondents, most often through discreet snowball sampling. The exception to this is an incidental survey by White (1997) that occurred through the collation of unsolicited responses to a "frequently asked questions" (FAQ) article about a particular drug, dextromethorphan (DXM), that was posted on a drug information site. White received so many reports of paranormal experiences with DXM, a dissociative drug commonly found in cough remedies, that a summary of the reports was published on the site, and is independently supported in part by a psychiatric-admission reportpublished elsewhere (Price & Lebel, 2000). DXM users reported OBEs—most often to noncorporeal locations—NDEs, and a loss of the sense of causality, as well as a sense of presence, encounters with entities, and the occasional experience of ESP but not PK.

In a survey of 1970s Californian marijuana (hereafter called cannabis) users, most of whom had also tried LSD, Tart (1993) found that the majority reported psi experiences occurring under the influence of cannabis, most often telepathy (69-83%) or precognition (32%) but occasionally PK (13%). This latter finding is unique to Tart's survey. Seeing auras while under the influence was reported by 50% of the respondents, and 44% reported having OBEs, although not necessarily while "stoned." Elsewhere, a survey of kundalini-type experiences with users of psychedelic drugs also reported the experience of psychic powers, intuition, and an increased sense of empathy (DeGracia, 1995). In a similar survey, psychedelic drug users reported OBEs, telepathy, empathy with other organisms, psychogeographic traveling, and contact with entities, with heavier users reporting more experiences overall (Kjellgren & Norlander, 2000-2001).

Survey research solely investigating the occurrence of OBEs has likewise found these to be related to the use of psychoactive drugs, such as LSD and cannabis, with 18-37% of OBEs occurring through the use of such drugs (Blackmore, 1982, 1984; Blackmore & Harris, 1983). These findings are further supported by the results of the surveys already mentioned and led Blackmore (1992) to conclude that what she terms "hallucinogenic" drugs undoubtedly helped induce the OBEs and were more useful for this than other drugs (e.g., stimulants, tranquilizers, sedatives, and alcohol).

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Although these surveys indicate that psychoactive drugs in general and psychedelic drugs in particular are associated with reports of paranormal experiences, it is unclear from this research which drugs are primarily related to which experiences. However, when we turn to anthropological, clinical, and even experiential research a picture of the possible taxonomy of such subjective paranormal experiences with differing substances begins to emerge. For instance, OBEs are occasionally reported to occur with most every type of psychedelic drug (Luke, in preparation) although such an experience is reported to occur most reliably with dissociatives such as ketamine (Department of Health, 2004; Jansen, 2001). In his ketamine model of the NDE, Jansen (1997) has proposed that this drug mimics the neurochemical process that occurs naturally during an NDE. Alternatively, Strassman (2001) has suggested that the endogenous psychedelic N,N-dimethyltryptamine (DMT) is fundamental to the NDE. Nevertheless, NDEs also seem to occur with the use of 5-methoxy-DMT (Roney-Dougal, 2001; Shulgin & Shulgin, 1997), a tryptamine that is very closely related to DMT. The NDE also occurs with other dissociatives besides ketamine, such as DXM (White, 1997). The occurrence of entity encounters and a sense of presence are also associated with these two groups of psychedelic drugs-dissociatives and the dimethyl group of tryptamines-the latter in particular. These experiences may also occur with other tryptamines, such as LSD, but not so prominently as with DMT and its related substances.

There is also a healthy body of folklore and first-person reports of encounter experiences with plant spirits or intelligences-what Letcher (2004) calls "animaphany"-with the use of naturally occurring plant psychedelics such as Psilocybe mushrooms, Salvia divinorum, and peyote, to name a few (e.g., Atkinson, 2004; Letcher, 2004; Luke, 2005; Vayne, 2001). Similarly, certain plants, such as datura and other members of the Solanaceae family, or certain decoctions-such as ayahuasca, which contains DMT-are known in folklore to supposedly enable communication with the dead. Ayahuasca, known as either "vine of the dead" or "vine of the soul" (Dobkin de Rios, 1972), is also said to produce shamanic death-rebirth experiences as well as telepathy, clairvoyance, and OBEs. Furthermore, Roney-Dougal (1991, 2001) has proposed that the psychoactive harmala alkaloids also found in ayahuasca, such as harmaline (once called telepathine), are responsible for producing ESP-like experiences. However, reviewing the complex neurochemistry involved, Roney-Dougal (2001) submits that it may be the DMT also present in such brews that induces the ESP experience (for a summary, see Luke, in preparation).

This paper aims to build on previous surveys by verifying past findings and investigating the relationship of certain substances to particular subjective paranormal experiences. Primarily, it seeks to identify possible psi-conducive substances or classes of substances and to establish the veracity of folklore and first-person accounts.

#### Method

#### Participants and Recruitment

There were 139 self-selecting respondents who completed the questionnaire online. Respondents were drawn from several groups, and it was requested that the questionnaire be completed by anyone who had had a paranormal experience or who had taken psychoactive drugs, and particularly by those of both categories. A request for respondents was included in an article about psychoactive drugs and parapsychology that was published in the Bulletin of the Multidisciplinary Association for Psychedelic Studies (MAPS) (Luke, 2004b). Requests for respondents were also made during talks on the topic at a conference on Consciousness (Luke, 2004c) and also at an invited lecture for the Society for Psychical Research (Luke, 2004a), both in the UK. Furthermore, notices were posted on parapsychology e-mail forums (the Parapsychology Research Forum, the Psi Society, Parapsychology Students, and Psipub), on psychedelic discussion forums (Psychonauts UK), and on a popular psychedelic-trance music forum (Psy-forum). A link to the questionnaire was also made available on the Parapsychology Association Web site. One third of the respondents (48) indicated that they found the survey through surfing the internet, almost certainly via the sources mentioned, with approximately another third (45) responding to the request through an interest in psychedelics and the remaining third coming by request from sources interested in parapsychology (31) or from unidentifiable sources (15). Responses were collected between June 2004 and February 2005 by convenience. The mean age reported was 32 years, with 62% male and 35% female respondents (3% no indication).

# Questionnaire

Simple demographic details were requested and were followed by the frequency of use of 10 classes of psychoactive drugs, ranging from "never" to "excessively" on a 7-point scale (see Appendix). Psychedelic drugs—as distinct from alcohol, prescription drugs, stimulants, opiates, and opioids—were subdivided into categories of cannabis, relaxants (e.g., GHB), empathogens (substances—usually phenethylamines such as 2CB, 2CI, and MDMA, which is known as "ecstasy"—that are characterised experientially by empathic emotions), dissociatives, and other psychedelics. A list of 18 (1 was removed prior to analysis as it was considered irrelevant, leaving 17) different types of paranormal, shamanic, and mystical-type experiences followed, with the same 7-point response scale for frequency of occurrence as was used for the frequency of drug use. The statements were generated by the authors to represent the kinds of experiences reported with these drugs, based on previous research (e.g., Tart, 1993; White, 1997). Each of these types of transpersonal experience was accompanied by a request to specify the influence of any psychoactive drugs and the corresponding frequency of experience while under the influence of such drugs, again on a 7-point scale. A final open-ended question asked if respondents had actively taken any substances to obtain any of the listed experiences.

# Procedure

Due to the imperative of maintaining the complete anonymity of drug users and to the geographically remote distribution of potential respondents, the questionnaire was made available online, which, in the circumstances, was considered to provide the most candid forum for such research (Hewson, 2003). The questionnaire was accessed via a short article about psychoactive drugs and parapsychological research that had appeared in the MAPS Bulletin (Luke, 2004b), and the author's e-mail address was made available for contact. Before the questionnaire, a notice informed respondents that their responses would remain anonymous and confidential.

# **RESULTS AND DISCUSSION**

# Data Treatment

To ascertain whether any of the questionnaires had been completed randomly, the data were inspected for contradictory responses, such as higher frequencies for experiences with drugs where no drug was specified. No such data were found so none were discarded. Of the 10 drug categories (see Appendix for examples), the few responses given in the "other" category were examined and recoded into one of the other nine drug categories.

Table 1 shows the percentage of respondents who reported the use of different classes of drugs in varying frequencies. Alcohol was by far the most common drug, followed by cannabis and then by psychedelic drugs, which were used occasionally or more often by about half of the sample. Respondents using one type of drug tended to report the use of other types as well, with the frequency of drug use correlating reasonably well (Pearson's r > .4) across all types with the exception of psychoactive prescription drugs—which did not correlate well with cannabis, psychedelics, or empathogens—and conversely the use of alcohol, which only correlated well with these latter three substances and with stimulants. The strongest correlations (r > .7) of the frequency of use were between psychedelics and both empathogens and cannabis.

	Percentage of	ercentage of respondents using the drug ( $N = 139$ )					
	At least once	More than once	Often or more frequently				
Alcohol	90.6	87.1	42.4				
Cannabis	77.7	69.8	43.2				
Psychedelics	56.8	49.6	28.8				
Stimulants	51.1	40.3	12.2				
Empathogens	43.9	36.7	16.5				
Prescription	36.0	29.1	12.2				
Dissociatives	35.3	24.5	7.9				
Opiates/oids	31.7	16.5	5.8				
Relaxants	27.3	20.9	7.2				

TABLE 1	
THE USE OF DRUGS OF DIFFERENT TYPES AMONG	RESPONDENTS

Table 2 shows the percentage of drug users and non-drug users reporting each of the 17 transpersonal experiences. The drug users category was intended to include all prolific illicit-drug users and was defined as anyone using any psychoactive drug except alcohol and prescription drugs more than once or cannabis more than just occasionally, given its mild effects and widespread use socially. Non-drug users were those remaining. Except for precognition, there was a clear trend for a greater proportion of drug users than non-drug users to report experiences, particularly OBEs, telepathy, encounters with beings of all types, and mystical-type experiences. Furthermore, in all cases a sizable proportion of the drug-using respondents also reported these experiences occurring while they were under the influence of such drugs, whereas this was not the case with those in the non-drug group, who used marijuana only occasionally or less frequently, and/or alcohol or prescription drugs. The most widespread occurrences among drug users under the influence were experiences of being out of the body, telepathy, becoming part of universal consciousness, and seeing auras of light. Caution is raised that the sample was not representative of the general population and that, relatively, the number of reported experiences is somewhat elevated in both the drug and non-drug groups of this paper in comparison to most general surveys (see Stokes, 1997).

The percentage of respondents who had tried an illicit drug even once (N = 110) and who reported a psi experience while under the influence (47%) was somewhat higher than the 28-29% and 18% found previously (Palmer, 1979; Usha & Pasricha, 1989a, 1989b), as might be expected from this sample. In comparison to the previous report by Tart (1993) of paranormal experiences among most users while under the influence of cannabis, this survey found that somewhat fewer experienced cannabis users (those using it often or more frequently, N = 60) than in Tart's study reported the occurrence of telepathy (20%), precognition (12%), psychokinesis (12%), and auras (22%) while under the influence. Yet, in this group the number reporting OBEs either with or without cannabis (62%) was larger than in Tart's study (44%).

I RANSPERSONAL EXPERIENCES								
	Drug user	Non-drug u	users $(N = 54)$					
Reported experience	% reporting experience once or more	% reporting experience while on drugs**	% reporting experience once or more	% reporting experience while on drugs***				
OBE								
(a) OBE <sub>1</sub> - on the material plane (b) OBE <sub>2</sub> – on	64.7	44.7	40.7	9.3				
another plane ESP	52.9	43.5	27.8	3.7				
(c) Telepathy	67.1	50.6	46.3	1.9				
(d) Clairvoyance	61.2	36.5	55.6	1.9				
(e) Precognition	48.2	21.2	51.9	1.9				
(f) Communication with the dead	36.5	18.8	33.3	3.7				
(g) Influence "other" with my mind	41.2	22.4	25.9	1.9				
Causality (h) Lost sense of causality	37.6	35.3	18.5	1.9				
Death								
(i) Death, rebirth, or past life	50.6	31.8	29.6	1.9				
(i) Entity encounter	38.8	318	14.8	1.0				
(k) Mythical being	50.0	51.0	14.0	1.5				
encounter	27.1	18.8	5.6	1.9				
Mystical (1) Plant/substance	45.9	42.4	7.4	0.0				
entity encounter (m) Divine being encounter	40.0	28.2	18.5	0.0				
(n) Powerful religious	48.2	38.8	25.9	1.9				
awakening (o) Sceing an aura of light	60.0	45.9	35.2	1.9				
(p) Universal consciousness	65.9	56.5	27.8	3.7				
(q) Dissolving into pure energy	48.2	42.4	14.8	3.7				
At least one listed experience	95.3	83.5	77.8	29.6				

TABLE 2 THE PERCENTAGE OF DRUG USERS AND NON-DRUG USERS REPORTING TRANSPERSONAL EXPERIENCES

\* Drug users were defined as anyone using psychoactive drugs, except alcohol and prescription drugs, more than once, or marijuana more than just occasionally.

\*\* Does not include alcohol or prescription drugs.

\*\*\* Includes alcohol, prescription drugs, occasional marijuana use, and LSD - tried once.

However, Tart's initial survey was conducted in 1970 among Californian cannabis-using students, epitomizing psychedelic drug culture at its height, a different sample from the one used in this study. Nevertheless, similarly to Tart's study, telepathy, clairvoyance, and OBEs on the material plane were the experiences most often reported to occur while under the influence of cannabis (Table 3).

Investigating reports of specific transpersonal experiences with particular drugs, we believe it is logical to consider which experiences are reported to occur most frequently under the influence of particular drugs rather than to consider which drugs most frequently are reported to coincide with particular experiences. This is because certain drugs may be more popular and thus more widely and more frequently used than other drugs. Certainly this is the case with alcohol and cannabis, yet no specific breakdown for the use of other drugs was available in this limited survey, which was intended to be as concise as possible. Further research of this type would benefit from an indication of the frequency of use for each drug so that a direct comparison of the prevalence of experiences can be made between drugs, though such questions are complex.

Table 3 shows the types of experience that occurred with particular drugs and the number of respondents who reported such an experience with that drug. With the exception of alcohol and cannabis, no direct indication is given of how many respondents have used each of the particular drugs, so the experiences presented only give an indication of which experiences are the most widespread among users of particular drugs (how many people in the overall sample report them) but not how prevalent they are (i.e., how often they occur with each user and each use). However, respondents also provided an indication of how frequently the experiences occurred under the influence of such drugs, but generally where at least several data points (five or more) could be compared, these tended to give a mean frequency of occurrence of "occasionally" for most experiences with most drugs. The exceptions to this are marked with an asterisk and represent a mean reported frequency of experience with the drug of between 4 and 5, or between "often" and "regularly."

It is apparent that the majority of specified drugs prominent in accompanying experiences come under this survey's classification of either psychedelic or dissociative, with the exception of alcohol, cocaine, and prescription drugs. In any case these later substances were associated with very few experiences, despite the widespread use of alcohol. A number of isolated experiences were also reported in conjunction with the use of other substances not reported in Table 3, namely the synthetic phenethylamine compounds 2CT7, 2CB, and 2CI (see Shulgin & Shulgin, 1991), with which aura experiences were most widespread; amphetamines, opium, ether, iboga, coleus, and 5-MEO-DiPT, which were reported but were exceedingly limited in any type of experiences; and finally datura, which accompanied one report of communication with the dead as expected from the literature.

Considering that LSD and *Psilocybe* mushrooms are no doubt among the most common psychedelic drugs, it is not surprising that they

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provided the most widespread reporting of experiences although the far more common substance cannabis was shown to exhibit equally widespread experiences but to a much lesser degree, indicative of this substance's milder psychedelic effects. On the other hand, the relatively rare psychedelic substance DMT and its even more obscure relative 5-MEO-DMT were shown to produce quite widespread experiences, probably indicating the reliably powerful effect of these two substances.

Considering those experiences that typify each drug across a spectrum of users, we found that the results corroborate many of the observations made in previous research. Largely supporting Strassman's (2001) observations, DMT was widespread in inducing entity contact experiences and OBEs, although primarily to other dimensions, and like 5-MEO-DMT, DMT commonly gave the experience of dissolving into a universal energy. The hypothesis that DMT is fundamental to the NDE (Strassman, 2001) was partially borne out by the relatively widespread reporting of death-like experiences (dying, rebirth, or memory of a past life) although such experiences seemed to be relatively more widespread with 5-MEO-DMT, as observed elsewhere (Luke, 2005; Roney-Dougal, 2001; Shulgin & Shulgin, 1997). However, the death-experience scale used in this study was too generalized, and a more specific measure of NDE would clarify this issue in the future.

Nevertheless, DMT, its close relative 5-MEO-DMT, and ayahuasca, the decoction in which DMT is found, all shared the same characteristic transpersonal features, although relatively more ayahuasca users reported contact with the plant/substance spirit than they did with the specific chemical compounds, as might be expected because the notion of sentience is more easily related to living organisms, though not exclusively (e.g., see Harvey, 2005).

Reports of communication with spirits of the dead were also relatively widespread with avahuasca, as expected. Interestingly, none of these 3 tryptamine substances were accompanied particularly by psiexperiences save the odd report with DMT, a finding somewhat counter to Roney-Dougal's (2001) later proposition that DMT might induce the ESP experiences prevalent with ayahuasca. Furthermore, the dearth of ESP experiences with ayahuasca in this sample failed to support the widespread reports of such experiences (see Luke, in preparation), and consequently Roney-Dougal's (1991) earlier proposition that the harmala alkaloids in ayahuasca induce ESP experiences was not supported here either. Indeed, the findings here might suggest that ayahuasca is, experientially, largely akin to the dimethyl tryptamines, though no firm conclusions can be made with this subsample that has so few people reporting the use of such substances. Variations in experience between reports may be due a variety of factors such as set (the experiencer's mindset prior to the drug experience), setting (the environment in which the experience occurs), expectation, intention, and so on, during the consumption period-factors that have

PSYCHEDELIC TRYPTAMINES						Dissociative	ES
	Psilocybe		5-MEO-				Nitrous
LSD	Mushroom	DMT	DMT	Ayahuasca	Ketamine	DXM	Oxide
Unity 21 Aura 21 Telep 14 Cause 14 OBE, 14 Relig 13 OBE, 12 Energ 11 Death 9 Clair 8 PK 5 Precog 4 Divine 4 Myth 4 Entity 3 Plant 3 Medium 2	*Plant 20 Unity 17 Relig 14 *Aura 13 Entity 12 Divine 10 *Clair 10 Telepath 9 OBE <sub>1</sub> 8 OBE <sub>2</sub> 7 Myth 7 Precog 7 Death 7 Energy 7 Medium 5 PK 5 Cause 5	OBE <sub>2</sub> 14 Entity 13 Energ 10 Divine 7 Plant 7 Relig 7 Cause 7 Death 6 Unity 6 Medium 3 OBE <sub>1</sub> 3 Myth 2 Clair 2 Telepath 1 Precog 1	Energy 4 Death 3 Cause 2 OBE <sub>2</sub> 2 OBE <sub>1</sub> 1 Medium 1 Entity 1 Myth 1 Unity 1 Relig 1	Plant 5 Entity 3 Medium 3 Death 2 Myth 2 Unity 2 OBE <sub>2</sub> 2 OBE <sub>1</sub> 1 Energy 1 Divine 1 Relig 1	OBE <sub>2</sub> 9 OBE <sub>1</sub> 6 Death 4 Cause 4 Unity 4 Energy 4 Clair 2 PK 2 Relig 2 Divine 1	Telep 2 Clair 1 PK 1 OBE <sub>1</sub> 1 Unity 1 Energy 1 Relig 1	OBE <sub>1</sub> 3 OBE <sub>2</sub> 1 Unity 1

 Table 3 (a)

 The Sum of Respondents Reporting Experiences With Different Drugs

\* mean of frequency of occurrence  $\geq 4$  ("often") where  $N \geq 5$ 

	THE SUM OF RESPONDENTS REPORTING EXPERIENCES WITH DIFFERENT DRUGS								
	Other psyche	delic plants		Other common drugs					
	Salvia	Mescaline	Amanita				-Prescribed		
Cannabis	Divinorum	Cacti	Muscaria	MDMA	Alcohol	Cocaine	Drugs		
*Telep14	Plant 10	*Aura 6	Plant 1	*Aura 8	Mediu 2	Mediu 1	Medium 1		
Clair 8	Entity 3	*Plant 5	Death 1	*Telep 6	Telep 1	Clair 1	Precog 1		
OBE, 8	Cause 2	*Unity 5	OBE, 1	*Unity 5	PK 1	PK 1	PK 1		
*Mediu 6	OBE, 2	Energy 3	-	Energy 4	OBE, 1	OBE, 1	OBE, 1		
*Plant 6	OBE, 2	Relig 3		Relig 4	Cause 1	Cause 1	OBE, 1		
Energy 6	Unity 2	Clair 2		OBE, 3			Death 1		
*Unity 6	Divine 1	PK 2		OBE, 2			Entity 1		
Aura 6	Myth 1	Entity 2		Clair 2			,		
Death 4	Relig 1	Divine 2		Death 2					
Divine 4	Death 1	Causality 2		PK 1					
Cause 4	Telepath 1	OBE, 2		Divine 1					
Relig 3		OBE, 2		Entity 1					
Precog 3		Telep 1		Cause 1					
PK 3		Precog 1							
Entity 2		Death 1							
Myth 2									
OBE 2									
-									

TABLE 3 (B) IF SUM OF RESPONDENTS REPORTING EXPERIENCES WITH DIFFERENT DRUG

\* mean of frequency of occurrence  $\geq 4$  ("often") where  $N \geq 5$ 

been shown to be fundamental to the nature of the psychedelic experience (Leary, Litwin, & Metzner, 1963).

Examining the experiences associated with ketamine, we found that OBEs of both kinds, but particularly to other dimensions, were the most widespread, as has been suggested elsewhere (e.g., Department of Health, 2004). Furthermore, somewhat supporting Jansen's (1997) ketamine model of NDE, death-related experiences were quite prominent with this drug although these do not necessarily equate to NDEs because of the generality of this item. Nevertheless, death-type experiences were also found to occur quite widely with DMT substances, as already noted, and with LSD to some extent, as also noted by Grof (1990).

In line with previous accounts (e.g., Atkinson, 2004; Letcher, 2004; Luke 2005; Vayne, 2001), reports of "sensing an intelligence or spirit being in an ingested plant or substance" were found to be most widespread while respondents were under the influence of the plant substances: psilocybincontaining mushrooms, ayahuasca (a mixture of plants), mescalinecontaining cacti, and Amanita muscaria, but especially with Salvia divinorum. Such plant-spirit experiences also occurred with the use of the cannabis plant, although the most widespread experiences with this drug were clairvoyance and OBEs on this plane and, primarily, telepathy, making this substance a prime candidate for ESP research, as has already been advocated by Tart (1993) for a number of reasons. The dissociative DXM is also a potential candidate for further ESP research, with some reports of psi occurring with its use both here, albeit with few specific reports, and elsewhere (Price & Lebel, 2000; White, 1997). There were also relatively widespread reports of telepathy with LSD and particularly with MDMA, a drug that is characterized by its capacity to induce empathic experiences and that has elsewhere been reported to induce telepathic experiences (Eisner, 1989; Saunders, 1993). *Psilocybe* mushrooms too demonstrated some relatively widespread capacity to accompany psi experiences of all kinds, particularly clairvoyance but even PK to some extent. However, possibly because of the more infrequent experience of PK, there did not seem to be any one substance that was related to it, with the possible exception of Psilocybe mushrooms, mescaline, and LSD, although none of these convincingly.

As expected (e.g., see Smith, 2000), most of the psychedelic drugs listed (including the dissociatives) also featured many mystical-type experiences, particularly "unity consciousness" experiences, but also lasting religious awakenings and experiences of "dissolving into the pure energy of the universe." Seeing auras of light was also quite widespread and reported to occur frequently with a number of drugs, particularly mescaline cacti (as also noted by Tart, 1972) and MDMA, but also with LSD and to a lesser degree with cannabis and *Psilocybe* mushrooms. That auras were not reported at all with DMT is not surprising because this substance is best experienced with the eyes closed, although interestingly no auras were reported with 5-MEO-DMT or ayahuasca either.

EXPERIENCES BY TYPE								
	Reported type of experiences (N = 139)							
Drug type	OBE	ESP	PK.	Causality	Death	Entity	Mystical	
Alcohol	.05	14	07	.09	.00	01	.06	
	(.548)	(.104)	(.427)	(.307)	(.963)	(.869)	(.501)	
Prescription	.02	03	05	.10	.19	.02	.09	
	(.801)	(.692)	(.576)	(.231)	(.026)†	(.821)	(.278)	
Stimulants	.20	.11	.09	.24	.16	.19	.26	
	(.016)'	(.182)	(.317)	(.004)†	(.066)	(.028)†	(.002)††	
Opiates/oids	.07	.02	.09	.19	.07	.11	.19	
	(.442)	(.786)	(.282)	(.028)†	(.399)	(.195)	(.024)†	
Cannabis	.17	02	.05	.11	.035	.1 <b>7</b>	.30	
	(.048)'	(.812)	(.530)	(.187)	(.679)	(.051)	(.0003)*	
Relaxants	.36	.20	.21	.25	.22	.33	.35	
	(.0001)*	(.016) '	(.011)†	(.003)''	(.098)"	(.0001)*	(.0001)*	
Empathogens	.25	10	.13	.22	.11	.12	.26	
	(.003)**	(.226)	(.125)	(.009)††	(.194)	(.175)	(.002)**	
Dissociatives	.26	.05	.19	.20	.24	.23	.29	
	(.002)"	(.524)	(.023)†	(.018)'	(.004)††	(.006)††	(.0006)*	
Psychedelics	.30	.03	.20	.23	.19	.20	.44	
	(.0004)*	(.689)	(.017)'	(.008)"	(.026)†	(.020)'	(.0001)*	

TABLE 4 CORRELATIONS BETWEEN THE FREQUENCY OF DRUG USE AND THE FREQUENCY OF EXPERIENCES BY TYPE

 $^{\dagger} p < .05$ ;  $^{\dagger\dagger} p < .01$ ;  $^{\ast} p < .0008$  all probability figures (in parentheses) are two-tailed

Table 4 shows the Pearson correlations for the frequency of use of each drug type with the frequency of experiences. For ease of interpretation and statistical power, the 17 transpersonal experiences were amalgamated into seven categories comprising OBE (a, b), ESP (c, d, e, f), PK (g), non-Causality (h), Death (i), Entity (j, k), and Mystical (l, m, n, o, p, q) (see Appendix for items a-q). To justify these categories, cross-correlations of the frequency of occurrence were inspected to ensure that items complemented each other. By this means, the ESP category contains the items relating to precognition, clairvoyance, telepathy, and also communication with the dead but not PK, which was seen as being independent from the other psi-type experiences. Encounters with plant spirits and divine beings were seen to relate best with other Mystical experiences, although they were also reasonably well associated with Entity experiences. On the whole, the occurrence of most experiences intercorrelated to some extent, so groupings are statistically quite arbitrary but are valid in indicating general conceptual differences.

In all, 61 correlations were calculated, so the alpha value was corrected to p < .0008 (identified by \*) to keep the .05 overall Type 1 error

value. As expected, alcohol, prescription drugs, stimulants, and opiates/ opioids did not significantly correlate with any transpersonal experiences, although, surprisingly, neither did empathogens (which include ecstasy, MDMA). Contrary to expectations, no significant correlations were found for ESP or PK, although some small nonsignificant correlations in the expected direction were found between PK and the frequency of use of dissociatives, psychedelics, and relaxants, and this latter group also correlated marginally with ESP. A post hoc analysis of the individual ESP-item correlations with the frequency of use of relaxants gave small significant correlations with telepathy, r(137) = .26, p = .002 and clairvoyance only, r(137) = .25, p = .003. However, these findings have not been reported anywhere else in the literature, and when asked to indicate which drugs had been associated with specific experiences, none of the respondents in this survey mentioned the influence of any relaxants, somewhat contrary to what might be expected from these correlations, so these results are possibly artifactual. Most likely, the general trend in the data for non-drug users to have fewer experiences than drug users has influenced the figures in relation to relaxants because only 27.3% (see Table 1) of the sample had actually used these substances. Further post hoc analysis shows that the removal from the sample of those who hadn't used relaxants eliminated the correlational trends between relaxants and the types of experience in all categories except for Entity-encounter experiences, r(36) = .33, p < .05, which may be a genuine relationship.

The lack of correlations between psi and drug-use frequency was surprising given previous findings and the greater number of drug users reporting telepathy, clairvoyance, mediumship, and PK (Table 2), as well as the relative number of psi experiences being reported with certain substances, such as cannabis (Table 3). Perhaps the most likely possibility is that the sample consisted largely of either psychedelic drug users, who tended to report the whole range of experiences, or nonpsychedelic drug users who, in this sample, had an interest in parapsychology and had paranormal experiences, as was requested in recruitment, but which were only really of the psi type commonly studied in parapsychology. Indeed, non-drug user figures in Table 2 exceed psi-type experiences reported in most general surveys (Stokes, 1997). In any case, the sample used in this study was very unlikely to be representative of the general population or directly comparable to previous samples, which exclusively used either drug users or students or persons responding to random mail-outs.

As was predicted, OBEs correlated significantly with relaxants and psychedelics, near-significantly with dissociatives and empathogens, and tentatively with cannabis and stimulants, supporting Blackmore's (1992) assertions about the efficacy of "hallucinogenic" drugs in inducing the OBE. Further post hoc analysis revealed that these correlations were due entirely to Type 2 OBEs, to another dimension. Furthermore, as expected, Mystical experiences correlated significantly with the use of psychedelics, relaxants, cannabis, and dissociatives and near-significantly with empathogens, and, surprisingly, with stimulants too. Of note, there were also varying degrees of near-significant correlations between Death, non-Causality, and Entity-experiences with the frequency of use of relaxants, dissociatives, and psychedelics. Of particular interest, a near-significant (p<.004) correlation was found between the use of dissociatives and Death experiences as might be expected from Jansen's (1997) ketamine model of NDE.

In keeping with the previous findings of correlations, ranging from r = .13 to .29, between the occurrence of paranormal experiences (including mystical experiences) and the use of all drugs (excluding prescription drugs) as measured with the AEI, the present study also found a positive correlation of r = .46 (p < .001). The greater correlation in this study was probably due to the use of different sample types, and variations in the questions used. In addition, an overall correlation was calculated between the frequency of paranormal experiences and the frequency of drug use (excluding alcohol and prescription drugs) that gave a small positive value of r = .31 (p < .001).

# **Open-Ended Responses**

In response to the open-ended question, several respondents indicated that they had specifically taken drugs, almost exclusively psychedelic, to actively induce the aforementioned experiences. Many of these reported that the paranormal effects were largely unpredictable although some reported having success in inducing certain experiences. Notably, two respondents from different sources reported recurrent group telepathy experiences with DXM, and several others suggested that their psychic experiences, although unpredictable, had been activated or increased generally since taking psychedelics. However, others said that they had already had the experiences before they started taking drugs. Four respondents explicitly stated that DMT consistently induced entitycontact experiences, described in one case as elves. Several respondents also reported encounter experiences with angels (independently with ayahuasca, mushrooms, DMT, and ketamine), and several others reported the use of a range of psychedelics specifically to contact "the Divine" or plant spirits. Ritual, reverence, and the religious or sacramental use of these substances was emphasized by many of those who had actively sought transpersonal experiences.

# CONCLUSION

The findings of previous surveys and observations from other research presented earlier have been largely supported by this paper, except perhaps for the relationship between ayahuasca and psi experiences. However, beyond supporting previous work, this survey has also gone some way toward identifying a taxonomy of paranormal and mystical experiences that tend to occur with different psychoactive drugs. That such consistent experiential syndromes exist with different mindaltering substances would be expected from such chemically diverse yet similar acting psychoactive substances. Furthermore, although most of the psychedelic drugs mentioned here appear to produce some fairly generic transpersonal experiences, each substance also shows the propensity for quite unique effects, such as the widespread experience of entity contact with DMT. Some substances, such as cannabis, *Psilocybe* mushrooms, DXM, mescaline, and LSD also show promise in helping to understand the experience of ESP, and other substances, such as nitrous oxide, ketamine, or 5-MEO-DMT may prove valuable in understanding out-of-body and near-death experiences.

Nevertheless, it is important to note that relating any one substance exclusively to any particular experience would be an oversimplification because it is the states that the substances induce rather than the chemicals themselves that are probably most salient, so factors of set, setting, intention, and expectation are paramount, as well as idiosyncratic neurochemistry. Such nonpharmacological factors are expected to contribute considerably in shaping the nature of experiences with psychedelic drugs, and this should be considered when interpreting our findings. Further phenomenological research might profit from investigating which specific alterations to consciousness are concomitant with particular paranormal experiences.

Whether or not such chemically induced subjective experiences correspond to genuine paranormal phenomena is unknown and a matter of debate because the experimental research to date, although promising, is rather preliminary and inconclusive (Luke, in preparation). What is obvious from the findings of this survey, however, is that psychedelics have a clear propensity for accompanying a wide variety of transpersonal and psi experiences that are highly comparable to spontaneous events. This factor is valuable in studying the phenomenology of such experiences and exploring potentially psi-conducive states of consciousness in experimental psi research, though there are obvious practical, ethical, and legal considerations with this research. Regardless of whether these psi experiences can be shown to occur as actual recordable events under tight experimental control, this area of research can still be fruitful in informing us about the psychological experience of psi and the neurochemistry of the psi experience.

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## APPENDIX

## PARANORMAL EXPERIENCE AND DRUG USE QUESTIONNAIRE

1. Please indicate how frequently you have used each of the following classes of drugs:

[responses: Never, Once, Occasionally, Often, Regularly, Extensively, Excessively]

Alcohol

Psychoactive prescription drugs Stimulants (e.g. cocaine, amphetamines) Opiates/Opioids (e.g. opium, heroin, methadone) Cannabis (e.g. marijuana, hash, grass, skunk) Relaxants (e.g. kava kava, GHB, GBL) Empathogens (e.g. ecstasy, 2-CB, 2-CI) Dissociatives (e.g. ketamine, PCP, DXM, nitrous oxide) Psychedelics (e.g. LSD, magic mushrooms, mescaline, DMT) Others, not listed or of unknown category (please specify)

2. Please indicate which of the following experiences you believe you have had. If the experience also happened whilst you were under the influence of any psychoactive substance please also *list* which substances these were and indicate how frequently the experience occurred only under the influence of the substances.

[Three response columns: Total frequency (7-point scale), Under the influence of (insert name), Frequency whilst under the influence of (7-point scale)]

"Whilst not dreaming, and without any normal explanation I have had the experience of..."

(a) being located outside my physical body somewhere on this plane

(b) being located outside my physical body somewhere in another dimension

(c) knowing what somebody was thinking so much that it must be telepathy

(d) obtaining previously unknown information without any possible access to it

- (e) foretelling a future event by some kind of precognition
- (f) communication with a deceased person or spirit

(g) influencing the behaviour of objects or people magically with my mind

- (h) completely losing sense of causality
- (i) dying, rebirth, or memory of a past life
- (j) encountering a non-animal intelligent entity

(k) encountering a mythical being

(1) sensing an intelligence or spirit being in an ingested plant or substance (m) contacting a higher power or divine being

(n) a powerful religious awakening, which has had a lasting effect on me

(o) seeing fringes of coloured light around people, commonly called auras

(p) my consciousness connected with the universal consciousness of all things

(q) dissolving into the pure energy of the universe

3. Have you, or do you ever take any substances to actively create any of the above experiences? If so please elaborate (open answer)

# ANOMALOUS COGNITION IN HYPNAGOGIC STATE WITH OBE INDUCTION: AN EXPERIMENTAL STUDY

## GUIDO DEL PRETE' AND PATRIZIO E. TRESSOLDI"

ABSTRACT: The main question addressed with this experiment is whether the hypnagogic state is a special mental state conducive of anomalous cognitive processes. Twelve volunteers with high scores on the transliminality or the absorption scale participated in a guessing-like task alternating trials in hypnotic and relaxed states of consciousness. Each participant contributed to 10 trials in a hypnagogic state and 10 trials in a self-induced relaxed state. Participants were shown 20 different series of 4 emotionally neutral figures presented in sequence one at a time for about 1 min on a PC monitor and successively presented all 4 to guess which one could be the target. Before the participant's choice, the target, chosen by a pseudorandom algorithm, was simultaneously presented on a monitor in a different isolated room connected with the apparatus installed in the subject's room. With hypnotic induction emphasising OBE in the hypnagogic state, the mean hits score was 37.5% whereas in the self-relaxation state it was at chance level, 25%. Further support for the hypothesis that the hypnagogic state is psi-conductive was obtained by the significant correlation between ESP performance in the hypnagogic state and the score on transliminality (.71) and absorption scales (.76). Induced hypnagogic imagery associated with a high level of transliminality and/or absorption is proving to be a special mental state conducive to ESP phenomena.

Among the so-called altered states of consciousness, hypnosis is considered one of the psi-favorable states. In his review of the physical, physiological, and psychological psi-favorable conditions, William Braud (2002) considered the relaxed condition that accompanies it as well as the increased tendencies toward creative imagination, suggestibility, absorption, dissociation, and a cognitive style that combines psychological components favouring the capacity to experience a whole range of ESP phenomena (Braud, Wood, & Braud, 1975; Gertz, 1983; Rose, Hogan, & Blackmore, 1997; Schacter & Kelly, 1975). More specifically, hypnagogic/ hypnopompic imagery has been associated with reports of ESP, apparitions, communication with the dead, and out-of-body experiences (OBEs) (Glicksohn, 1989; Mavromatis & Richardson, 1984; Palmer & Lieberman, 1975). For a review of the anomalous cognitive processes associated with hypnagogic/hypnopompic imagery, see Sherwood (2002).

Alvarado's (1998) complete historical review of the relationship between ESP and altered states of consciousness presents the rise and fall of interest by parapsychological researchers in the role of hypnosis as a favourable condition for ESP. In 1969, Honorton and Krippner reviewed the existent literature and found that in 9 out of 12 studies in which the hypnotic condition was compared to a nonhypnotic condition, hypnosis yielded better results.

Stanford and Stein (1994) reviewed by means of a meta-analysis the literature investigating ESP using hypnosis from 1945 up to 1993. The main result drawn from 25 studies, 23 of which used forced-choice tasks, revealed an effect size  $\pi = .524$  (SD = .035), corresponding to a z score of 8.77 for hypnosis, compared to an effect size  $\pi = .505$  (SD = .031) in the control conditions, corresponding to a z score of .34 (MCE = .50).

This revision not only gives evidence that the hypnotic state is a promising mental state for ESP investigation comparable to the ganzfeld condition but also precisely analyzes flaws presented in the studies, such as agent and receiver in the same room, target knowledge by the experimenters, inappropriate scoring registration, shuffling instead of proper randomization, and lack of balance between the control and the experimental conditions.

Our experiment was an attempt to enhance the hit score in the hypnagogic state by eliminating all potential flaws and considering some new moderators not examined before.

As first potential moderators, we considered absorption (Tellegen, 1981; Tellegen & Atkinson, 1974) and transliminality (Lange, Thalbourne, Houran, & Storin, 2000; Thalbourne, 2000) two personality characteristics previously associated with ESP performance. Although Talbourne (1998) obtained a Rho = .72 correlation between the two scales, they are not measuring identical personality and experiential characteristics, so we decided to use them both.

Both scales have been used to explore paranormal experiences and paranormal capacity (i.e., Thalbourne, 1996, 2004). The transliminality scale, for example, comprises 14% of the items related to paranormal experiences. A significant positive correlation between transliminality scores and performance in telepathic transmission of emotional states was obtained by Sanders, Thalbourne, and Delin (2000) whereas highly transliminal participants were significantly more likely to score a hit in a psi experiment using the *J Ching* (Storm & Thalbourne, 1999).

Absorption scores correlate with OBEs (Dalton, Zingrone, & Alvarado, 1999) and anomalous experiences (Kennedy, Kanthamani, & Palmer, 1994) as well as with hypnotizability (Glisky, Tataryn, Tobias, Kihlstrom, & McConkey, 1991). For these reasons we decided to select participants according to their scores on these scales.

As described in the Methods section, all participants filled out the two scales and were selected as participants if their score in at least one scale was equal to or above a cutoff point.

As a second potential moderator, we considered a modification of the hypnotic induction procedure emphasising out-of-body experiences (OBEs). We took inspiration from Palmer and Leiberman (1975), who induced OBEs by means of a progressive relaxation technique followed by monotonous auditory stimulation and ganzfeld. Using a clairvoyance task similar to the one used in that study, we added post-hypnotic OBE suggestions in order to help participants collect more details of the target, either by means of a real OBE or by enhancing their confidence to be able to see the target mentally.

Unlike the Palmer and Leiberman (1975) study, but similar to what was used in most of the studies examined by Stanford & Stein (1994), we chose a forced-choice instead of a free response task.

## Method

## Participants

Twelve participants (9 male, 3 female; mean age = 35.08) were recruited from participants attending courses given by the first author. The Tellegen Absorption Scale (Tellegen & Atkinson, 1974) and the Revised Transliminality Scale (Lange, Thalbourne, Houran, & Storm, 2000) were distributed to the participants. They were selected if their scores were above 9 (corresponding to 25.7 of a maximum of 37.3 of the corrected scores) on the Revised Transliminality Scale' and/or above 23 (over 2/3 of the range, 0-34) on the Tellegen Absorption Scale, which were chosen as arbitrary cutoffs to select "ESP conducive" participants.

## Task

The task was devised as a simple gambling-like task. Twenty different series of four emotionally neutral figures<sup>2</sup> (representing landscapes, animals, buildings, flowers, etc.) were presented in sequence one at time on a PC monitor for about 1 min and successively presented simultaneously to let the participant guess which one could be the target. At the same time, the target, chosen by a pseudorandom algorithm,<sup>8</sup> was projected to a second monitor in an isolated room connected with the apparatus installed in the

<sup>1</sup> At the time of this study we were not aware of the methodological note of Houran, Thalbourne, and Lange (2003) in which it was suggested to use the 29-item scale even if the score has to be computed on the 17 items of the revised scale. However, for the purpose of selecting participants with high scores, the risk of imperfect differential item functioning is irrelevant.

<sup>2</sup> The level of emotionality of each figure was measured by asking 10 independent judges to rate each picture on a 10-point scale from 0 (no emotion) to 10 (high level of emotion). The mean score was 1.5, SD = .5.

<sup>3</sup> The randomisation procedure is a subroutine of the Delphi<sup>TM</sup> programming language used to create the software for this experiment. Briefly, this program returns a random number within the range 1-4 (corresponding to the four pictures) after an initialisation with a random value obtained from the system clock. The equality of the numbers 1 to 4 was tested using the  $\chi^2$  statistic and the result was nonsignificant.

room where the subject was located. During the experiment the two rooms were completely isolated. The experimental assistant and the participant could not see what was shown in the adjacent room.

## Procedure

Each participant was shown the room where the target was going to appear and was then invited to lie down on a couch in the main room, isolated from environmental noise. The task was explained as follows:

> When you will be in the desired mental state after selfinduced relaxation or induced hypnagogic state, you will see four pictures presented one after another for about 1 minute each, on the monitor. Then you will see all the four pictures and you will have to choose the target. Remember not to try to discover any rule because the target is chosen by a randomised algorithm. Before the target choice, we will suggest that you imagine going into the adjacent room where the target will appear on the monitor you saw before. Once you choose the target, you will point at it and tell me which one is it.

The experimenter then input the answer on the computer and the program recorded the choice in a file without any feedback.

Self-induced relaxation included mainly bodily and mental relaxation freely chosen by each participant. None of them was expert in this or other similar self-relaxation techniques. In this respect they are to be considered naïve.

The hypnagogic state was induced by the first author, an expert hypnotist. The procedure started with a modified Jacobson technique (20-30 min) followed by 15-20 min of real hypnotic induction with indirect flight suggestions, according to the Erickson procedure, to induce spontaneous OBE experiences, plus an element of expectancy or "mental set" whereby the participant was encouraged to want an OBE and to believe it could happen.<sup>4</sup> The attainment of the hypnagogic state was based on behavioral indices observed by the expert hypnotist. The main indices are: deep muscular relaxation, slow and regular breath, reports of spontaneous images, slow ocular movements, and a sensation of hand paralysis.

The participant was instructed to report every impression arising during the hypnagogic state. Following the reception period, participants were shown the four possible targets and asked to choose the real one using their impressions.

<sup>&</sup>lt;sup>4</sup> The detailed description of the hypnotic suggestions may be requested from the first author.

Anomalous Cognition in Hypnagogic State With OBE Induction

Each participant did 10 trials in the hypnagogic state and another 10 trials in a self-induced relaxed state on four or five different days in order to reduce fatigue or boredom. In every session there was the same number of self-relaxed and hypnagogic trials. To reduce possible carry-over effects, the order between the 2 experimental conditions was balanced in the following way: for each participant there were 5 self-relaxed followed by hypnagogic and 5 hypnagogic followed by self-relaxed sessions in alternating sequence (10 sessions of 2 trials each).

## Results

## Absorption and Transliminality Scores

Means and standard deviations on the absorption and transliminality scales were, respectively, 25.5 (6.3) and 9.8 (2.7).

## Hits Scores

Ten out of 12 participants obtained a higher score in the hypnagogic than in the self-relaxed state, 1 participant obtained an equal score, and the last 1 obtained a higher score in the self-relaxed than in the hypnagogic state (see Table 1).

There were no statistical differences in the hits obtained in the self-relaxed condition before and after the hypnagogic one (z = .26; p = .79; two-tailed) and in the hypnagogic condition before and after the Self-relaxed one (z = .42; p = .67; two-tailed).

Participant	Self-Relaxed	Hypnagogic	First condition
А	2	5	Self-Rel
В	1	4	Self-Rel
С	3	5	Self-Rel
D	3	2	Self-Rel
E	3	4	Self-Rel
F	2	3	Self-Rel
G	3	3	Hypnag
Н	2	4	Hypnag
I	2	3	Hypnag
L	3	5	Hypnag
м	2	3	Hypnag
N	3	4	Hypnag

TABLE 1
RAW HITS SCORES (MAX = 10; MCE: 2.5) OF EACH PARTICIPANT IN THE
SELF-RELAXED AND HYPNAGOGIC CONDITIONS

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The mean percentages of hits obtained by the 12 participants in the 2 experimental conditions are illustrated in Figure I (MCE = 25%).



Figure 1. Mean percentages of hits and corresponding 95% confidence intervals in the self-relaxed and hypnagogic mental states

The statistical comparison between the two conditions with a paired t test yielded a statistically significant result t (11) = 4.00; p = .002, two-tailed); Effect Size d = -2.41; CI 95% [-4.80 to -.71]. To test the reliability of this result, the data were reanalyzed using the bootstrap procedure of Simstat<sup>TM</sup> software (Péladeau & Lacoutre, 1993). The descriptive statistics of the t test after 100 resamples are, Mean = -4.45; p = .001 (two-tailed); CI 95% [-8.74 to -2.04].

If we would express the effect size using  $\pi$  (Rosenthal & Rubin, 1989), the result in the hypnagogic condition would be:  $\pi = .64$ ; CI: .55-.72; Contrast:  $\Delta \pi$  .14.

#### Correlations With the Absorption and Transliminality Scales

Correlations among the hits obtained in the self-relaxed and hypnagogic states and the scores obtained from the absorption and transliminality scales are presented in Table 2.

TABLE 2
CORRELATION VALUES R AND CORRESPONDING CI, 95%, BETWEEN HITS AND
Absorption and Transliminality Scores

.44] .19 [41 to .66]
.92] .71* [.23 to .90]

\* *p* <.01

Both the absorption and the transliminalityscoresshare almost 50% of the variance with the hits but only when participants are in the hypnotic state. This almost identical result of the two scales is partly a consequence of their moderate correlation, r = .70. These results are discussed further in the following section.

## DISCUSSION

The percentage of hits obtained in the hypnagogic condition is not only statistically significant but corresponds to a relevant effect size in the range of the best results obtained with the ganzfeld and hypnosis techniques. For example, the more recent revision of the studies using ganzfeld by Bem, Palmer, and Broughton (2001) yielded an overall hit rate of 30.1%, Stouffer Z = 2.59, p = .0048, one-tailed, whereas the Stanford and Stein (1994) meta-analysis yielded an effect size  $\pi = .524$  (SD = .035), corresponding to a z score of 8.77.

The increment of hits in the hypnagogic condition in 10 out of 12 participants is well above the mean expected by chance, and the high correlation between hits and scores on the absorption and transliminality scales seem to support the view that the hits difference between the hypnagogic and the control condition is due to the particular mental state induced in the hypnagogic condition. The nonstatistically significant correlations between the scores on the absorption and transliminality scales and the hits in the control condition are not a statistical artifact (the range is similar to the hits in the hypnagogic condition) and suggest that participants with relatively high scores on at least one of these scales may exploit their ESP capacity only if in a mental state similar to the one induced with hypnosis. To our knowledge this is the first evidence of this association, and it is evident that further replications are necessary before arriving at more precise interpretations.

We note that in the control condition we suggested simply that participants relax mentally and physically and choose the preferred means and level of relaxation. More structured procedures such as listening to special tapes or music are clearly more apt to induce a mental set potentially psi-conducive, as Honorton (1977) and Storm, and Thalbourne (2001) have documented. However, we think that psi-favouring post-hypnotic suggestions that the expert hypnotist can add after the hypnagogic state is obtained may enhance the results with respect to the ganzfeld or other more structured procedures.

As for the role of the OBE suggestions inserted in the induction procedure, even though only 2 participants reported specific OBE sensations, i.e., hearing a click while "leaving" the body and vibrations in the physical body, we think that the emphasis on suggesting that the participants have an OBE may have contributed to the overall result by enhancing their expectation and confidence to be able to see the target.

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To summarize, even if the hypnagogic induction requires more time than the ganzfeld condition and requires a specific experience to obtain it, we think that with some selected participants, i.e., those with high levels of absorption or transliminality, this special state of consciousness seems to facilitate psi because it may exploit the potentiality of these personality characteristics to

> cross the threshold to receive experiences whose sources are in preconscious or unconscious processes. Persons who manifest a medium to high degree of transliminality might then be expected to have erupt into consciousness, from the preconscious, experiences that we variously know at relatively low intensities as psychic, mystical and creative. (Thalbourne, 2000, p. 5)

An interesting discussion of hypnosis as a liminal phenomenon was recently presented by Krippner (2005), in which the author underlines the fact that hypnotized people often report hallucinations that confound their ordinary distinctions between reality and illusion, external and internal processes, and many other binary oppositions, including time and space as well as mind and body.

Furthermore, in the hypnagogic state the hypnotist may add special suggestions to enhance ESP performance. Our OBE induction seems promising and we are planning to exploit it in a future series of experiments.

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# DOES PRECOGNITION FORESEE THE FUTURE? SERIES 4: A POSTAL REPLICATION

## By FIONA STEINKAMP

ABSTRACT: The study reported here is a replication of a previous postal study examining the possibility of true precognition. The previous study (Steinkamp, 2000) revealed chance results for true precognition but significant results for the clairvoyance condition. However, a similar study in the laboratory (Steinkamp, 2001) yielded almost significant results for true precognition. The replication study reported here tried to emulate the conditions in the laboratory but in the setting of a postal study. For instance, this time participants were given a relaxation tape to help them get in the right frame of mind for the experiment and they were not sent their target pool until after they had submitted their mentation reports. Results from the study were at chance. There was no obvious indication that participants' putative lack of motivation might have influenced the outcome. Also, participants who reported having had psychic experiences did not perform any better than those claining no such experience. It appears that either postal experiments are not suitable for eliciting evidence for true precognition, or, if true precognition is possible, it can occur only with a much shorter precognitive interval than these experiments have allowed.<sup>1</sup>

A methodological issue early on in precognition research has been to devise a procedure to rule out real-time alternatives in experimental tests for precognition. Even in the very early tests for precognition, it was soon understood that good results in tests could be explained through real-time psi. Thus, the initial experiments by Rhine (1938), in which participants tried to guess the order in which the ESP cards in a deck would be after the pack had been shuffled, could be interpreted as successful due to a "psychic shuffle" performed by the person shuffling the deck. That is, the shuffler may shuffle the cards so that they conform to the pre-existing guesses rather than the guesses predicting the future state of the deck of cards (see Rhine, Smith, & Woodruff, 1938). Traditionally, Mangan's (1955) procedure, in which a complex calculation using square roots and sines on the outcome of a dice throw is used to determine the future target, was thought to be sufficient to rule out real-time psi explanations. The Honorton and Ferrari (1989) meta-analysis of forced-choice precognition experiments indicated that studies using this procedure still obtained overall significant results. Earlier, however, Morris (1982) had noted that studies using stock market figures on a prespecified future date tend not to obtain significant results. Also, he had conducted an experiment in which it appeared that someone could psychically ascertain which dice numbers they would have to throw in order to obtain the correct target after the Mangan-type calculations had been performed (Morris, 1968). Thus, contrary to the previously held views, the

<sup>&</sup>lt;sup>1</sup> I would like to thank the Bial Foundation for financing this research.

Mangan procedure may not have ruled out real-time psi because, according to Morris's experiment, it may be possible to use real-time psi plus deduction via the Mangan method. The closing price or volume of stock market sales is arguably less likely to be able to be determined by real-time psi than the Mangan method. First, even if real-time PK could be used to influence the purchasing patterns of stocks and shares, people whose livelihoods depend on the stock market would collectively have more of an incentive to use their PK than a single person in an experiment who has no financial gain to make. Second, it would be difficult for anyone telepathically to know real-time what all the different people were likely to bid in the next few days; indeed many people may not know themselves until minutes before bidding. Consequently, real-time psi appears to be unlikely to operate on the stock market and if experiments using stock market figures to determine a future target are generally unsuccessful, it may be that true precognition is not possible.

The three previous studies in this series examined this issue in some detail by comparing results from trials using a clairvoyance protocol, in which the target had already been selected at the time of the participant's guess, with results from trials using a true precognition protocol, in which the target was determined by the performance of the stock market on a prespecified date a few days after the participant had made his or her guess. If true precognition can occur, it should be possible to gain significant results in the true precognition condition. Each participant in each study did two trials, one in each condition, with the belief that both trials were precognition ones. One study was conducted through the mail (Steinkamp, 2000), another in the laboratory, and the third through the World Wide Web (WWW) (Steinkamp, 2001). The results were contradictory, with promising results in the clairvoyance condition for the laboratory experiment, and a tendency for psi-missing in the precognition condition in the WWW experiment. The results are summarised in Table 1.

SUMMARY OF PREVIOUSLY PUBLISHED RESULTS FROM SERIES 1-3								
		Precog				Clairvoyance		
	Ν	z	<i>p</i> *	ES (z/√N)	N	z	p*	ES (z/√N)
1. Postal	75	-0.67	.50	08	74	1.72	.08	.20
2. Lab 3. Web	80 100	1.85 -1.74	.06 .08	.21 17	80 100	0.15 0.85	.88 .39	.02 .09

	TABLE 1				
MARY OF PREVIOUSLY	PUBLISHED	RESULTS	FROM	SERIES	1

\*two-tailed

These results raised the question of whether the tendencies toward significance in each experiment were indicative of real effects or whether the findings were due to multiple analysis. Moreover, if the findings were suggestive of real effects, why did each experiment produce such radically different results?

On a post hoc basis, it is easy to think of reasons why the difference in experimental setting may have produced different results. In the laboratory experiment participants listened to a relaxation tape suggesting that they were in a timeless zone in which they could see past, present, and future at once. After listening to this tape, they listened to white noise for 20 min and said aloud any thoughts that came to them about a picture they would later receive through the post. Afterward they were shown four target possibilities (all postcard-sized pictures) and they rated each picture as to its similarity to their mentation. Thus in the laboratory experiment participants were helped by strong suggestions about the possibility of precognition. However, in the postal experiment participants were sent a sealed envelope with four target possibilities and were asked to take time at home to gain impressions about what picture they would later receive through the mail. They subsequently opened the sealed envelope and rated all four pictures in terms of similarity to their impressions. Participants then mailed back their ratings and the pictures. Thus, because participants already had the four target possibilities in their possession at the time they gained their mentation, and because they had no relaxation tape, participants may have been focusing more on the envelope already in their possession rather than on the picture they were later to receive. This may be why the laboratory experiment gained promising results in the precognition condition whereas the postal experiment gained better results in the clairvoyance one.

Series 4 reported here, a replication of the postal experiment, was designed to examine these issues by making the new postal experiment resemble more closely the laboratory experiment. Thus the following changes were made:

1. Participants were furnished with the same relaxation tape as those in the laboratory received.

2. Participants were not sent the target materials until they had submitted their mentation.

3. Experimental power was increased so that an effect, if present, could be detected.

4. Each participant did only one trial.

It was hoped that these four changes would turn the previous chance results for true precognition to a positive one.

## METHOD

## Materials

Target materials. Before the experiment started, 200 target sets of four pictures each were created. Thus there were 800 pictures in total. Around 60 sets consisted of pictures that had been used successfully in previous

studies (e.g., Delanoy, Morris, Watt, & Wiseman, 1993; Steinkamp, 2001); the others were printed out from the WWW or were picture postcards. Their themes were varied—some were cartoons, some were abstract art, some were photographs or realistic art, and some were pencil drawings. They could be black and white or coloured. Each picture was mounted on  $9" \times 6"$  grey cardboard and was identified on the back by its own unique, randomly assigned, four-digit number. Each set of four was placed in numerical order in a sealed opaque brown envelope.

First information pack. This pack included:

- a letter welcoming participants to, and explaining, the experiment
- an empty, unsealed envelope
- a relaxation tape

The tape talked participants through a relaxation routine in which they were led to think of themselves going up into the sky, which was a timeless zone, until they got to a point where they had access to all times. The routine ended with them imagining that the picture in their envelope was coming towards them. The tape ended with 10 min of silence.

- a sheet of paper on which the participant could write down their mentation
- a questionnaire

The questionnaire was optional. It contained questions about the spontaneous psychic experience that the participant may have had and also included Eysenck and Barrett's (1985) abbreviated neuroticism scale.

• a stamped, addressed envelope for their reply

Second information pack. This pack included:

- a letter explaining what the participant had to do next
- a sealed envelope containing their set of four target possibilities
- a ratings form
- a prepaid envelope for return of the materials

# Participants

One hundred and forty participants were recruited to take part in the experiment by (1) placing letters in various British local newspapers; (2) calling for participants in the *Paranormal Review* (a publication of the Society for Psychical Research); (3) advertising on UK newsgroups on the internet; and (4) calling for participants on the UK paranormal (e-)mailing list. In order to be eligible, participants had to have access to a tape recorder, and those who thought they had had a psychic experience at some point in their life were told that they were particularly welcome. Recruiting and the experiment took place from September 2001-December 2002. Of the 140 participants recruited for the experiment, 80 (57%) completed it, of whom 32 were men and 48 were women. Their age ranged from 17 to 74 years, although a number of participants opted not to give this information. Fifty-seven participants (71%) reported having had a psychic experience at some point in their life.

## Procedure

When a participant wrote in to ask to take part, a computer program generated five random numbers between 1 and 50 and stored them in an electronic file for that participant. These numbers indicated which five stocks (the same stock could be selected more than once for one participant) should be used on a prespecified future date (explained below) from a list of 100 stocks in the *Financial Times*. The experimenter then sent the participant his or her first information pack.

On receiving the pack, participants were asked to personalise the empty envelope (e.g., write their name on it, draw a picture, etc.). Participants were informed that this was to help them bond with the envelope in some way because it would later contain a picture that the experimenter was going to send them through the mail. At a convenient time, participants listened to the relaxation tape, attempted to gain impressions about the picture they would later find in their empty envelope, and then wrote down or drew their impressions on the sheet provided. Participants then returned the tape, their mentation, their personalised envelope, and optionally the questionnaire in the prepaid envelope. Results from the survey will be reported in a separate paper as analyses have not yet been conducted on the questionnaire data. When the experimenter received the returned materials, they were given to a colleague (IS) unopened.<sup>2</sup> IS opened the participant's returned materials, checked that the participant had completed the task, and then photocopied the enclosed mentation report and added it to the second information pack so that the participant could be reminded of his or her impressions. The second information pack was then posted to the participant. The experimenter saw neither the photocopy nor the original report of the participant's mentations.

On receiving the second information pack, participants opened the enclosed sealed envelope containing the target set of four pictures, described on the ratings form how well each picture matched the impressions they had gained, and gave a percentage rating for each picture as to how closely it matched their impressions. The picture to which they gave their highest rating was the picture they thought they would later receive through the

 $<sup>^2</sup>$  I would like to thank Jo Smith (JS) for photocopying and storing the mentation reports. She also performed all the double-checking at the end of the study, for which I am also very grateful.

mail. Participants were requested to give no two pictures the same rating and to return the ratings form and the pictures in the prepaid envelope.

The postmark on the envelope containing the returned ratings and pictures determined the date for retrieving the stock market figures. The date used was two days after the postmark; if the envelope arrived before two days had elapsed from posting, the envelope was set aside until the relevant day. The envelope was not opened. A relevant day was a day on which the stock market figures were published in the *Financial Times* i.e., Tuesday through Friday. Thus, if an envelope arrived on a Thursday, Friday, or Saturday the day for retrieving the stock market figures would be Tuesday.

On the relevant day, the five stocks to use were retrieved from the computer and their closing prices were looked up in the newspaper. The last digit of these five closing prices determined an entry point into a random number table, and the number from this table in turn determined which of the four pictures the participant should receive. The number obtained from the table was independently double-checked by a colleague, and the colleague also checked that the returned envelope was still sealed and that the participant number on the outside of that sealed envelope coincided with the number of the participant whose stock market figures were being checked. A colleague retained the obtained target number on file.<sup>3</sup>

Once the target number had been double-checked and stored, the participant's envelope was opened and his or her enclosed rating of the target picture was converted to a rank. Thus, if the participant gave the target picture the highest percentage rating of the four pictures, the rating of the target picture was converted to a rank of 1; if the target picture had been given the second highest percentage rating of the four pictures, it was converted to a rank of 2, etc. The target picture was retrieved from the participant's returned envelope and placed in the participant's personalised envelope.

The participants were then sent the target picture in their personalised envelope and a feedback letter telling them whether the picture selected was their 1st, 2nd, 3rd, or 4th choice. They were asked to return the target picture in a prepaid envelope. Thus each participant did only one trial for this experiment and all trials were testing for true precognition. It was prespecified that the study would end when participants who had not completed the experiment had been sent a maximum of three reminders. All participants who completed the study were sent feedback of the overall results of the experiment.

JS double-checked the data in the colleague's possession with the data on the experimenter's database; she also checked that the ratings were accurately transferred to the database from the participants' forms and that the ranks to the targets had been correctly assigned.

<sup>&</sup>lt;sup>3</sup> I would like to thank Paul Stevens and Caroline Watt, who did most of this checking; and especially the latter, who was also responsible for storing the target numbers.

#### RESULTS

#### **Descriptive Statistics**

Originally, the study was planned to comprise 200 completed participants. Also, we had initially hoped to conduct the experiment as a dream study in which participants gained their impressions about the picture during sleep after listening to a relaxation tape in bed. Participants were also to be selected on the basis of having had a precognitive experience. Thus to take part participants needed to (1) have good dream recall; (2) have had a precognitive experience; and (3) have access to a tape recorder in bed. After 6 weeks and a large recruitment drive, only 7 participants had been recruited and 3 of those had dropped out. It was clear that the experimental conditions were not realistic for the time available, so the requirements were changed to those described in the Method section (i.e., 140 participants were recruited, those reporting psychic experiences were preferred but others were also welcome, and the experiment took place in a waking state). These changes had the advantage of making the present study closer in style to the previous laboratory study. The statistics reported throughout this section include the 4 participants who took part in the early dream-study design (of whom 3 scored a rank of 4 and 1 scored a rank of 3.5).

The response rate in this study (57%) is similar to the response rate in the previous postal study (55%). A total of 27 (34%) of the 80 participants needed at least one reminder before they completed the experiment. Of those who needed reminders, 18 participants needed one, 7 needed two, and 2 needed three.

#### **Preplanned Analyses**

The main aim of the study was to see if evidence could be obtained for true precognition. The study yielded no such evidence. The sum of ranks (SOR) for all 80 participants was 202.5 (MCE = 200), z = -0.2, ES  $(z/\sqrt{N}) = .02$ , p = .42 (one-tailed). The results remained nonsignificant even with the 4 dream trials excluded from the total: SOR = 177 (MCE = 190), z = 1.28, ES = .15, p = .10).

#### Post-Hoc Analyses

1. Because about a third of all participants needed to be sent at least one reminder before they completed the experiment, there was some concern that perhaps they had lost the motivation to do the experiment. If this were the case, one would expect there to be a correlation between the number of reminders a participant needed and the rank to the target. No such correlation was found, r (78) = -.03, n.s.

2. Due to the changes from the original experimental design, it is possible that the participant population in this study may differ slightly from that in the previous postal study because in this study not all participants reported having had a psychic experience. Thus an analysis was performed to see if those reporting a psychic experience performed better than those who reported no such experience. No difference in performance between the two groups was found (U = 627, N = 80, z = -0.31, n.s.)

3. A survey of precognitive experiences by Hearne (1984, 1989) found that women over 40 years of age who reported their first precognitive experience earlier on in life went on to have more children. This correlation was subsequently replicated in the work of the current author using women aged over 45 years. Hearne hypothesised that women who had such experiences only later in life were meant to be "seers" for the community rather than to have children. Thus, according to Hearne, women aged over 40 years with fewer children should be more psychic. There was a promising trend in my last postal study for women over the age of 45 years with fewer children to perform better, so this analysis was performed here. The correlation in the survey findings was again upheld, with women aged over 45 years reporting their first precognitive experience earlier on in life having more children, r(9) = -0.58, p < .05, indicating that the general effect was still there in the population used for this study. However, no correlation was found between the number of children among women aged over 45 years and performance at the psi task, r(21) = -0.27, n.s. Hearne's survey findings are more likely to be due to social factors than to Hearne's hypothesis. For example, religious women may be more likely to report experiences early on and be more likely to have children, thus creating the correlations in the survey findings. However, these issues will be discussed more fully in a later paper devoted to the results from the survey. The experimental findings went in the reverse direction to those from the previous postal experiment, so there is no particular experimental support for Hearne's thesis.

4. Participants who completed the optional questionnaire before taking the test also completed Eysenck, Eysenck, and Barrett's (1985) reduced neuroticism scale. A correlation was performed between the neuroticism scores and the ranks obtained in the experiment. An almost significant negative correlation between neuroticism and precognition scoring wasfound, indicating that those who scored high on the neuroticism scale performed slightly better in this experiment, r(60) = -0.22, p < .1, two-tailed. This finding is contrary to Palmer's (1978) review, which indicated that high neuroticism correlates with bad scoring in forced-choice experiments. It is unclear whether the findings from Palmer's (1978) review also hold for free-response studies. Nevertheless, the correlation found in the study reported here might support Schmeidler's (1988) later observation that those scoring high on neuroticism scales will perform well when in their own environment but worse when in the laboratory. Evidence

for this hypothesis is, however, somewhat conflicting (see Schmeidler 1988 for a review). Moreover, the previous postal study found a slight trend in the reverse direction (N = 69, r = .07, n.s.) from the one in this new postal study. Thus it is more likely that the significant correlation between high neuroticism scores and good precognition results in the current experiment is an artifact of multiple analysis.

5. Haraldsson (1993) found a significant relationship between religiosity and forced-choice ESP scoring. The optional questionnaire in the postal study reported here included an item asking participants if they currently belonged to a religion. Although this question does not fully address the idea of religiosity, a Mann-Whitney U-test was performed to see if those who responded positively to this question performed better. They did not (U = 398, N = 58, z = -0.33, n.s.).

#### DISCUSSION

Neither this postal study nor the previous study yielded any evidence for true precognition. Several changes were made in the current study in the hope of improving on the results from the previous one, but these changes failed to have the desired effect.

The first change was the use of a relaxation tape. This tape was almost identical to that used in the previous laboratory study, which gained results approaching significance for true precognition. The use of this relaxation tape did not improve the results in this most recent postal study. Thus, if the relaxation tape was useful in the laboratory study, it must have been useful only in conjunction with other aspects of the laboratory experiment (e.g., the experiment not taking place at home, the tape being followed by white noise, etc.).

The second change was to place more emphasis on the precognitive aspect of the task by not giving participants their target pool until after they had submitted their mentation. Thus participants did not have a target set in their possession at the time they gained their impressions of the target and, therefore, participants should have been less likely to be side-tracked to thinking about their target set rather than about the picture that would be in their personalised envelope. This change in procedure also does not appear to have helped results.

Participants who needed to be reminded several times about the experiment did not perform any worse than those who completed the experiment straight away. Consequently, there do not appear to be immediately obvious motivational reasons to explain why participants were unable to select the correct target more often than by chance.

Although the original postal experiment included only those who had reported having had a precognitive experience and who had filled out a questionnaire about it, in the postal experiment reported here, there was no difference in performance between those who had reported psychic experiences and those who had not. Thus the chance results from this experiment cannot easily be explained by claiming that this postal study used a different population or that participants in this study had confided less in the experimenter.

Results from the previous experiments did not indicate that participants were in any way trying to gain precognitive information by inferring the future through using real-time psi. For instance, in the previous studies the volatility of the participants' stocks did not make any difference to participants' scoring, whereas, if one thought that participants were trying to work out psychically what the future stock figures would be, participants with stocks that were less volatile should have fared better. This was not the case. Similarly, in the previous studies there was no indication that participants tended to guess the target according to what it would have been had the stock market figures been used from the day of their mentation rather than from a few days later.

However, it may be that true precognition is possible only for very short precognitive intervals. If this is so, in this and the previous experiments one would not expect participants to score any better by using real-time means, because a two-day precognitive interval or more is impossibly long anyway. Alternatively, it may be that postal experiments are particularly unsuited to a true precognition protocol. Perhaps participants need the support of an experimenter and the comfort of a laboratory setting in which they feel that anything might be possible. Additional experiments have been conducted to explore further the laboratory and WWW settings as a means of gaining evidence for true precognition. The results from these studies may provide some indication as to where a possible answer may lie.

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# TOWARD A REPLICATION OF THE "FINGER-READING" EFFECT

## By YUNG-JONG SHIAH

ABSTRACT: The "finger-reading" effect refers to successful identification by touch of apparently flat target numbers, colours, words, or symbols on paper in conditions where the participant is unable to see, or feel, or have any normal sensory cues to assist tactile identification. Studies of this have been running for over a decade in Taiwan. Nearly a quarter of children, after several finger-reading "training sessions," have appeared to be able to determine the identity of targets by means of directly touching a 2-digit number or a complex character varying in 4 different colours printed by an ink printer on paper. Training procedures developed by Si-Chen Lee appeared to yield exceptional tactile recognition or extrasensory perception via the fingertips of children. However, these results may be unreliable due to a lack of rigorous controls to rule out possible fraud. It is thus not yet safe to assume that parapsychological abilities were in fact successfully measured. In this paper, pilot trials are considered that would develop empirically and assess controls on the fingerreading training processes. Modifications to training procedures are proposed. If the finger-reading effect can be replicated under robust and credible conditions, then perhaps more research resources could be attracted to investigating the possibility of exceptional and parapsychological finger-reading abilities in children.

The present paper builds on work described in previous papers on the finger-reading effect (Lee, 1998, 1999, 2002, 2003; Lee & Chang, 2001; Lee, Chen, & Tang, 2000; Lee, Tang, & Kuo, 2004; Tang, Lee, & Hsu, 2000). The detailed finger-reading literature review can be seen in the author's paper (Shiah & Tam, 2005). This paper will focus on the finger-reading training paradigm developed by Si-Chen Lee. There, the average success rate in recognition (by a p < 0.05 criterion) by means of directly touching a two-digit number or a complex character varying in four different colours printed by an ink printer on paper was 24% (41 out of 173 participants) (Shiah & Tam, 2005).

Children for whom the techniques seemed to be successful reported that distinctive visual images had accompanied their successful trials. These visual images appeared as if seen in the real world. The children subjectively reported seeing answers on a "transparent" screen, sometimes an "opaque" screen (Lee, 1998, 1999; Lee, Chen, & Tang, 2000; Shiah & Tam, 2005; Tang, Lee, & Hsu, 2000). Children appeared to easily recognise complex characters or other complex symbols after seeing an opaque or distinct screen masking their normal vision. Having this visualising experience of an opaque screen in the mind correlated highly with correct recognition of targets. One approach would involve using more complex characters that would in turn produce more complex visual imagery in the children's minds.

The possible existence of finger-reading ability gives rise to three important issues. First, the results of extrasensory perception (ESP) have generally been found elusive, weak, unreliable, and lacking in quality (Kennedy, 2001). ESP is a general term used for all paranormal abilities that cannot apparently be explained in "rational" terms (Irwin, 2004). Many researchers (Alcock, 2003; Burns, 2003; Jeffers, 2003; Milton & Wiseman, 1999, 2001) have concluded that there has not been sufficient evidence to support the existence of ESP. However, according to Lee's findings, nearly a quarter of unselected participants were capable of showing finger-reading ability after training. This is a decisive effect, suggesting that a strong and reliable finger-reading ability might exist.

Secondly, it has been claimed that ESP ability could be trained by repeated practice with positive results (Braud & Wood, 1977; Honorton, 1970; McCallam & Honorton, 1973; Ryzl, 1962, 1966; Ryzl & Pratt, 1962; Targ & Tart, 1985; Tart, 1966, 1975, 1977, 1986; Tart, Palmer, & Redington, 1979). On the contrary, this assumption has not been supported in other studies (Beloff, 1967; Delanoy, 1986; Fourie, 1977; Gissurarson, 1990; Jackson, Franzoi, & Schmeidler, 1977; Morris, Robblee, Neville, & Bailey, 1977; Stanford, 1977; Utts, 1995; Vitulli, 1983). If ESP phenomena are real, we still do not have a reliable method for eliciting them, so it might be worthwhile investigating how this training procedure might work.

The third issue is that the quality of the subjective visual imagery reported by participants plays a key role in successfully identifying targets. This might indicate that vivid imagery is a good predictor of fingerreading ability. As described above, there are two reported levels of visual imagery. One is that seeing a transparent screen indicates some successful recognition of targets. Another is that seeing an opaque screen indicates a still higher success rate at recognizing targets. If finger reading is real, one would expect its manifestations to be predictable.

However, we can formulate clear but basic questions: Is the fingerreading effect real/replicable? Were all the successful studies merely replicating errors and vulnerable to fraud? To date, the results of the fingerreading effect are subject to criticism (Du, 2005). For instance, the fingerreading effect may have involved merely normal tactile ability or may have resulted from fraud due to a lack of stringent safeguards (Shiah & Tam, 2005). Thus, more stringent safeguards need to be considered for these procedures.

Before additional finger-reading experiments are conducted, this paper aims to make the finger-reading training procedures more stringent. The development of the ganzfeld technique provides a good model for finger-reading training procedures. The ganzfeld technique involves participants experiencing target-related imagery under sensory deprivation conditions (Irwin, 2004). The ganzfeld technique is regarded as providing a good research tool to produce replicable evidence of psi ability (Utts, 1991). This is because much effort has been made to modify the procedure and safeguards to meet strict standards (Goulding, Westerlund, Parker, & Wackermann, 2004). Thanks to the ganzfeld technique developments of the 1970s (Braud, Wood, & Braud, 1975; Honorton & Harper, 1974), the procedure is now highly shielded against sensory leakage (Morris, Summers, & Yim, 2003). The technique was tested and modified in more than 100 studies over the last three decades (Palmer, 2003; Parker, 2003). ("Sensory leakage" occurs when participants obtain information sensorily rather than extrasensorily [Irwin, 2004].)

Following the example of the ganzfeld technique, the author proposes three stages to develop a well-controlled paradigm of fingerreading training. The first stage is to examine the original finger-reading training procedures in order to obtain sufficient information to design "temporary" training procedures. In the second stage, this temporary training paradigm will be empirically tested. Finally, a well-modified finger-reading training paradigm will be proposed for future research. An experienced parapsychologist, the late Professor Robert L. Morris, was involved in suggesting modifications to this training paradigm.

## METHODOLOGICAL PROBLEMS WITH FINGER-READING TRAINING PROCEDURES

The major problems with ESP experimental designs are: interpretations as coincidence, poor observation, deception, and sensory leakage (Hansen, 1990; Milton, 1996; Morris, 1999; Steinkamp, Milton, & Morris, 1998). In order to eliminate those problems, the original fingerreading procedures were initially examined in a recent study (Shiah & Tam, 2005). The procedures and issues associated with inadequate controls are outlined briefly below. In addition, pilot trials will be conducted to develop procedures empirically and examine controls on the finger-reading procedures. Modified procedures are proposed.

## Material

The stimuli consisted of  $5 \times 8$  cm rectangular pieces of paper. In the middle of each piece of paper was a two-digit number from 11 to 99 in one of four different colours (black, green, blue, and red) printed by an ink printer. Confounding numbers, or "double chance numbers," such as 16 and 91, 19 and 61, 18 and 81, 66 and 99, 69 and 96, 68 and 89, 86 and 98, were excluded, so there were 75 numbers used in all. The trial samples were always prepared by a research assistant who did not participate in the finger-reading training process. They were folded twice and all put into a big envelope. Each sample was used only once in all procedures. In Training

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2, the digits were replaced by a Chinese character. Sometimes, for example, in some special conditions, the stimuli were drawn on a  $5 \times 10$  cm or  $3 \times 10$  cm rectangular piece of white paper (Lee, 1998; Lee, Chen, & Tang, 2000). Written or printed on the paper was a Chinese character or an English word or a symbol or a mathematical formula.

## Barrier

The barrier (see Figure 1) is a black bag normally used for handling or changing photographic negatives (double-lined changing bag,  $45 \times 60$ cm, Hakuba Photo Industry Co., Ltd.). Two cuffs are snugly fitted around the participant's forearms and the bag has two layers, each with its own zipper. Hardly any light could enter the bag, as was empirically shown by a light detector. The participant's hands could be moved freely within the bag. The purpose of the bag was to prevent the participants, experimenters, and coexperimenters from seeing the targets.



1a. The bag has two layers, each with its own zipper.



1b. The participant's two hands are fitted into the bag.

Figure 1. The experimental bag

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# Warm-Up Training Before Finger-Reading Training

Participants were first required to watch a 30-min videotape describing this "touch reading" phenomenon, including how to identify the target. First, participants were required to sit, close their eyes, and breathe deeply with a calm and peaceful mind for at least 10 min. Then participants were required to practise image-making. The experimenter showed an object, such as a red apple, to the participants, who were asked to look at the apple very carefully and remember every detail of it. Then they closed their eyes to visualise the apple exactly as they perceived it. Next, they visualised the apple changing its colour three or four different times, e.g., to green, then to blue, and finally to black.

# Training Procedure 1: Directly Touching a Two-Digit Number

The experimenter usually drew 10 samples randomly from the big envelope and put them on the coexperimenter's chair. Then the co-experimenter clenched one sample in his or her fist, put it into the bag, and closed the zippers. Participants must not see the target during this process. Next, participants put their hands into the two sleeves of the black bag and the sleeves were tied up. Participants were then required to open the folded samples and use their fingers to feel the targets. Participants were asked to focus on touch and to imagine that they could see the numbers while touching them. There were no time restrictions and participants were free to use whatever scanning pressure and speed they chose. They removed their hands to write down the answer after they had told the coexperimenter what they saw and the coexperimenter had recorded their response. The coexperimenter then took out the training item from the black bag and showed the target number to the participant. Thus, the participants received feedback and the coexperimenter recorded whether each participant's response was correct. Usually, children would attempt 20 items in one session, lasting 2 hr.

## Training Procedure 2: Directly Touching a Complex Target (a Chinese Character)

Participants who had a statistically significant performance level were invited to attend this further session. Most of these reported experiencing a subjective visual experience when recognising the targets, and many of them described seeing a transparent or opaque screen in their mind. This training procedure was the same as the training procedure above for directly touching a target (involving two-digit numbers), but the stimulus was now a Chinese character. The purpose of the training was to help children to have the superior imagery function that tends to be associated with experiencing an opaque visual screen. It was found that an opaque screen occasionally occurred in this training session. This might account for the better ability to correctly identify targets. Sometimes, in special conditions, one experimenter and several coexperimenters carefully watched the participant in Training Procedures 1 and 2.

#### Methodological Problems

There are three obvious methodological problems with these procedures as pointed out in the past (Shiah & Tam, 2005). The first is randomisation. A target may not have been randomly selected from the target pools. The second problem regards sensory leakage. For example, the detailed information on how targets are obtained was not described. The production of stimuli was not standardized in all procedures. Third, fully detailed information of safeguards was not provided. Usually, one coexperimenter worked with two or sometimes three participants. The coexperimenter could not therefore reliably observe each participant's responses and behaviour.

## **Pilot Trials**

A pilot study ought to be conducted before a formal experiment, not only to maximize the possibility for participants to show their ESP ability but also to assess the efficacy of the controls that will be used in the formal experiment (Wiseman & Morris, 1995). In this regard, the author has carried out pilot trials of finger reading in Taiwan. One of the main purposes was to check the entire training procedure in order to develop effective barriers against possible fraud in later experiments. The other purpose was to examine whether Lee's finger-reading effect had any potential for use in further work. Twenty-two participants aged from 7 to 11 were recruited. They were trained to feel directly a two-digit number or a Chinese character on paper printed by an ink printer. In response to the inadequate controls described above, modifications to overcome these shortcomings in the author's pilot trials were made.

Although the overall results of the author's pilot trials indicate a significant result, it should be noted that the finger-reading procedure was vulnerable to cheating. For example, peeking behaviours might occur when the participant touched the target in the black bag. Participants might have seen the samples through an opening created by pulling at the two tight cuffs of the bag. Moreover, during the process of touching a target, the participants were allowed to remove their hands from the bag to write down their answer; then they could put their hands back in the bag. This would increase the possibility of peeking behaviours. For these two reasons, the author will not report the results of these pilot trials in this paper.

# TOWARD A REPLICATION OF "FINGER-READING": MODIFYING THE TRAINING PROCEDURES

Before the modified finger-reading training procedures are proposed, two problems need to be solved. This first is the peeking problem. To solve this problem, the author suggests adding eight new strategies. First, the author has designed an effective barrier, which is an 80 x 80 cm black screen with two cuffs snugly tied around the forearms. The barrier has two holes for the forearms to be inserted through before they then enter the black bag. The two holes of the screen are 8 cm in diameter and are 1.5 cm from the bottom. The distance between them is 15 cm. This screen can be set up on the table between the participant and the bag (see Figure 2). Second, the author suggests that at least one experimenter and one coexperimenter should closely monitor the participant, with one positioned on each side of the barrier. Third, experimenters and coexperimenters should make sure that the hands are properly inserted into the cuffs and that the barrier and bag are snugly tied/fitted around the forearms. Peeking can only take place if any gaps in the barrier-cuff and the bag-cuff are lined up exactly, as the participant could then conceivably peer through any small gap, although this would be impossible to achieve without the observers immediately noticing the participant contorting his or her body in order to see through the gap. Fourth, a part of the participant's arms should be exposed (see Figure 2b). Thus, any attempts at lining up gaps in the cuffs of the bag and barrier will be easily observed. These modifications should make peeking impossible, but in addition, fifthly, the author suggests using a video camera to record the whole process. Thus, the possibility of unnoticed peeking, perhaps as a result of the experimenters and the coexperimenters not observing closely enough, could be ruled out. The ideal view for recording the process must include the cuffs of the bag and the screen (see Figure 2b), as these are the only possible areas where gaps could be lined up. The recorded data should be viewed by a different researcher to check whether any peeking took place.

Sixth, the trial should be considered invalid when participants pull at the tight cuffs of the bag or the screen to make openings. Seventh, participants should not move their arms unnecessarily or pull at the bag or cuffs during touching, to minimise possible peeking in terms of causing any openings of the cuffs of the bag and the screen. Finally, the sample should be placed in a sealed opaque envelope to ensure that the experimenter/ coexperimenter and participants cannot see it and that the envelope is not opened until it has been inserted into the double-zipped bag. The sealed envelopes can be put into an opaque plastic bag. The purpose of a sealed opaque plastic bag is to avoid the envelope's being rendered transparent by the application of water, alcohol, or oil. The opaque plastic bag can be put into a big envelope, which should be signed by the research assistant and be sealed with tape at both ends so that any tampering would be detected. The envelope or plastic bag should be tested under sunlight or strong light to prove that the targets cannot be seen. Under this condition, it is impossible to see any targets in the big envelope containing envelopes. Participants should not have a chance to see envelopes containing targets before or during the experiment. Under these arrangements, experimenters and coexperimenters too should not be able to see any targets.

The other question to be addressed is whether tactile cues might account for the finger-reading effect. The tactile task used in the fingerreading studies and the author's pilot trials involved ink-printed text, which is in a range of 1-20 microns (0.001-0.02 mm) in elevation. It is hypothesised that the paper absorbs most of the ink, implying a near zero elevation. To verify this hypothesis, the surface topology of the printing in terms of four different colours was investigated by means of the novel 3D surface profiler instrument Dektak 3, (Veeco Instruments, Inc.). The remarkable features of this instrument are its wide range of scanning area ( $\sim 50$  mm) and high vertical resolution ( $\sim$ 0.01 nm). The horizontal and vertical axes of the printing were scanned to measure distance and vertical height, respectively. The printing in terms of a two-digit number or a three-letter English word was on a  $5 \times 8$  cm rectangular piece of paper (A4 white 75 g/m<sup>2</sup>; H. E. Copier). Each digit or English letter size was 24 points in Times New Roman printed by a Hewlett Packard Officejet G85 colour printer. The result indicates that ink elevation and paper roughness cannot be distinguished, indicating a zero elevation.

## The Modified Finger-Reading Training Procedures

In view of the peeking problem and inadequate controls described above, many safeguards will be used in the finger-reading processes in order to prevent possible fraud. The detailed materials and precise procedures for researchers to explore the finger-reading effect will be provided as an example.

## Participants

According to Lee's findings, participants aged 7 to 13 are promising recruits. Participants who have a history of nerve or brain injury, finger trauma, or learning disability (including dyslexia), diabetes (because of associated peripheral neuropathy), and calluses on their finger pads should be excluded. These factors might affect tactile and learning results (Goldreich & Kanics, 2003; Vega-Bermudez & Johnson, 2004).

## Prespecifications

Experimenters have the right to declare a trial invalid if any of the following occurs:



2a. The screen with two tight cuffs 2b. The screen set between the participant and the bag

Figure 2. The experimental screen
- 1. A participant takes the stimulus out of the black bag
- 2. A trial is interrupted
- 3. The tight cuffs of the screen or bag are pulled at by a participant to cause an opening
- 4. A participant is unable to successfully open the envelope and extract the target under these "blind" conditions

Hypotheses and analyses should be specified in advance.

# Barriers

The author suggests three kinds of barriers. As described before, the first is the screen, the second is the black bag, and the last is the video recorder.





# Experimental Room

To guard against peeking, the room should be isolated and without windows, mirrors, or holes. One experimenter, one coexperimenter, and one participant should be in the room when the experiments are being conducted. The coexperimenter should give the participants the stimuli and record their responses with a video recorder as well as observing them. The experimenter should only record and observe participants' responses and behaviours. The author suggests that one experimenter and one coexperimenter stand on each side of the screen (see Figure 3). The participant's behaviour should be clearly monitored. Thus, the general guideline for the positions of an experimenter, a coexperimenter, and a video camera is that the frame of observation must include a clear view of the participant's hands, the cuffs, and the bag. The best view for a video camera can be seen above in Figure 2b. All participants' responses should be videoed in case the need for checking any details arises.

# The Procedure of Touching the Two-Digit Number Directly

Touching stimuli. All experimental samples should be prepared in advance by a research assistant who will otherwise not be involved in the experiment. The coexperimenter who handles the target envelopes should have no relationship or contact with the assistant who prepared the targets.

The target stimuli should be produced in a strictly standard way: A two-digit number from 11 to 97 varying in four colours (e.g., red, green, blue, and black) should be printed in the middle of the paper. Numbers and their colours should be randomly generated by a computer generator designed by Paul Stevens, a research fellow of the Koestler Parapsychology Unit at Edinburgh University. The stimuli should be generated using a pseudorandom sort routine (based on the Microsoft Visual Basic RND function, seeded by the computer timer at the start of the program). The 75 numbers used should be the same as Lee's. A number with a colour should be randomly selected as a replacement; thus, the same targets could possibly be repeated. This is the most unpredictable randomisation, having no patterns that participants could possibly predict. Each trial will be independent from every other. For example, in each trial, each target with a particular colour always has a 1 in 300 chance-mean chance expectation (MCE)—to be randomly selected by the computer programme. Subsequent trials will be chosen from the original pool, meaning these also have a probability of 1 in 300.

Based on previous experience, a participant could usually try 20 samples in a section within 2 hr. Thus, the computer generator should be set to generate a certain number of sets of 20 targets at once. However, note that researchers can decide the number in each set as needed. All targets prepared for all participants will be generated in a single run by the computer generator. This means that the planned targets for all participants will be generated after running the computer generator in a single run.

The sample can be made up of  $5 \times 8$  cm rectangular pieces of paper (A4 white 75 g/m<sup>2</sup>; H. E. Copier). Each digit's size can be about  $0.6 \times 0.5$  cm (Times New Roman, 24 points) printed by a Hewlett Packard Officejet G85 colour printer, which was confirmed to produce a zero elevation. It has

been suggested that there is a close parallel spatial relationship between tactile character recognition and visual recognition (in millimetres) (Loomis, 1990). The size of the character is not crucial for a successful tactile identification but the bandwidth, namely visual legibility, is important. The digit size used here was very easy for visual identification; accordingly, it was presumed to be relatively good for tactile identification.

Each sample should have a fold with a 1.5 cm length on the top left corner (see Figure 4) as a cue for participants to touch the target exactly. The person who prepares the samples should use a meter scale to make sure of the right length. Sheets should be folded before the numbers with colours are printed on them to avoid possible frauds. Specifically, note that the fold should be made before the target is randomly selected by the computer generator. If not, for example, the fold might be made slightly bigger if the number is higher, giving participants a cue to make a comparable judgment. Likewise, one corner of the paper could be cut to indicate which way is up. Participants were informed by other means to help the orientation in pilot trials before. They were told that the printing on the paper faces the front of the envelope, that the bag and target are not upside down, and that the front of the envelope faces the front (zipper side) of the bag. However, some of the participants were confused about the orientation of the target in the "blind" condition. This might lead to a psychological effect on participants' performance and is the reason why a fold is suggested to avoid such confusion.



Figure 4. The target sample and its fold

Each stimulus is put into a sealed opaque envelope of  $15.2 \times 8.9$  cm size (Niceday envelopes, manila plain 70 gsm, gummed, product code 182543, Guilbert Company). The 20 envelopes in a pile are put into an opaque plastic bag. Each envelope is discreetly numbered to aid double-checking of results. The opaque plastic bag can be put into a 22.9 x 16.2 cm opaque envelope (Niceday envelopes, manila plain 90 gsm, gummed,

product code 183422, Guilbert Company). This big envelope should be signed by the research assistant and be sealed with tape at both ends so that any tampering would be detected by the coexperimenter who cuts open the envelope during the experiment. The big envelope should not be opened until the experiment. These two types of envelopes and plastic bags were tested under sunlight to prove that targets cannot be seen. It was found to be impossible to see any targets in the big envelope within the plastic bag containing the 20 envelopes. Each set of envelopes should be numbered faintly 1-20 (for experimenters' recording procedure only) by pencil on the outside, which is not detectable by touching. Each small envelope can be sealed with its gum, yielding no different feeling between envelopes. Each piece of paper needs to be placed exactly in the middle of each small envelope. The short side of the paper needs to contact the bottom of the envelope. The printing on the paper needs to face the front of the envelope, ensuring that the printing is not upside down (see Figure 5).



Figure 5. The target sample and its envelope

The stimuli, small envelopes, plastic bags, and big envelopes should be used only once. Thus, participants cannot receive any target feedback marked on those materials by previous participants. The stimuli should be stored in a different room, to which neither participants nor the coexperimenter has access. Participants should not see any targets or their containers until receiving feedback. The research assistant who prepares the samples should save detailed information about the list of the stimuli in a secure computer and a copy on a disk in a sealed opaque envelope. Only the research assistant should have access to the computer and the sealed envelope containing the disk. This sealed envelope should be opened only after the experiment has been conducted. A double check of the stimuli after the experiment can be done to find possible recording errors or cheating by replacing samples.

Finger-reading procedure. Before the experiment, participants should be asked to show that their hands are empty and especially not concealing any trial samples used in the experiment. The coexperimenter should

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make sure that the black bag is empty between trials. The purpose of these checks is to prevent conjuring tricks being used to conceal trial samples. Additionally, the participants should not be allowed to carry any mobile phones or radio equipment to guard against communication with any possible accomplice.

*Warm-up training before the finger-reading training.* The training period should not exceed 2 hr a day due to children's limited attention. There can be a 15-min break each day, during which participants can be rewarded with drinks or snacks.

The process begins with warm-up practice. First of all, the experimenter turns the light off. Participants should be required to sit, close their eyes, and breathe deeply with a calm and peaceful mind for at least 3 min, after which the light should be put back on. Then participants should be required to practise "image making." The experimenter should show a simple object such as a red apple to the participants, who should be asked to look at the apple very carefully and remember every detail of it. Then they should close their eyes to visualise the apple exactly as they perceive it. In Lee's and the author's pilot trials, all of the children seemed to be able to perform this task. Once they can do this, they should try to visualise the apple changing its colour three or four times, i.e., through green, blue, and black. Participants should also see a demonstration describing the "touch reading" phenomenon, including how to identify the target.

# Procedure for Touching a Two-Digit Number

Participants can be given three to five practice tries. The experimenter should give the coexperimenter one big envelope containing a plastic bag inside which are 20 small envelopes. The coexperimenter should open the sealed big envelope, take one small envelope from the plastic bag, put it into the black bag, and then close the zippers. The rest of the small envelopes should be kept in the plastic bag until required. Thus, participants should not see any envelopes during this process. Participants tended to avoid calling previous targets in the guess sequence in ESP tasks (Ertcl, 2005), although this guessing strategy cannot raise the probability of hit rate. Participants should be clearly informed of the meaning of randomisation.

Next, participants should put their hands into the two tight cuffs of the screen and the black bag. They should be required to open the sealed envelope to take out a target sample to scan using their fingers. According to the participants' experience in pilot trials, it was found to be easy and quick to open the envelope to remove the target paper without tearing the paper or adding additional folds. Participants should be taught to tear the very end of right or left side of the envelope to remove the target paper because the target paper will be in the middle of the envelope. During the finger-reading training procedure, the participants should be required to focus on touch and to imagine that they can see the numbers while touching the target. They should be told that there is a fold in the top left corner as a cue for them to touch the target exactly. Participants should be told not to add any additional folds or any marks on the target paper to keep targets intact so they can be checked later if necessary by another independent researcher to see if any obvious patterns were made by the person who prepared the targets.

There are no time restrictions, and participants are free to use whatever scanning pressure and speed they choose. They should be asked to inform the coexperimenter about whatever they see and feel. They cannot take their hands out of the black bag during the touching procedure. Participants should be told that pulling at the bags or cuffs is not allowed, and to avoid any unnecessary movement of their arms. They can take their hands out of the black bag only after they tell the coexperimenter their final response. In the meantime, the coexperimenter and the experimenter should record the participants' responses and response times.

After the participant finishes the trial, the coexperimenter takes out the item from the black bag and shows the number with its colour to the participant. Participants therefore get feedback and the coexperimenter is able to record whether the participant's response was correct. The reason for giving feedback is so that participants are able to learn whether their judgments are accurate. It is hoped that this will help to induce and improve any finger-reading ability in terms of permitting a target-related image to come to mind. According to previous experience, children could try around 20 items within 2 hr. Each participant should try at least 80 samples in this experiment over 4 different days, or more if time allows.

If participants want to have a break during the experiment, the coexperimenter should seal the big envelope containing the plastic bag holding the rest of the samples and put it into another isolated room. The experimenter should lock the room so that no one can access the room and the samples.

It should be noted that the sequence of targets presented to participants should not be changed. If a set of 20 targets cannot be completed by a participant, the next participant can use the rest of them. Statistically, this action cannot affect hit rates since the targets are selected randomly. The big envelope containing the plastic bag holding the unfinished samples should be signed by the coexperimenter and sealed with tape at its opened end. The experimenter should store the big envelope in another locked room.

If participants succeed in three consecutive correct recognitions of numbers with their colours, in addition to giving their verbal reports, they should be asked to describe and draw how they visualised their correct answers. This might provide possible answers as to how children decide

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their responses in their minds and about the details of mental imagery. Three hits reach a significance (p < .05, binomial, one-tailed, MCE = 1/300) when total trials are 245 for each participant. As a result, 3 hits could be a good score when total trials of a participant do not exceed 245.

It has been suggested that the light might reduce the chances of recognising colours (Tang, Lee, & Hsu, 2000). Consequently, the author suggests using light while conducting the finger-reading studies, but the issue of whether light is necessary for recognising colours should be further explored in later studies.

# Procedure for Touching an English Word Directly

Earlier it was noted that seeing a "screen" played an important and common role in successfully recognising targets while touching stimuli; the screen was reported by the children to last for several seconds. There are two reported forms of screen: transparent and opaque. The transparent screen was frequently activated when the children directly touched a twodigit number, and the opaque screen was more often activated as children directly touched a complex target. The author suggests that in future studies a complex target should be used, such as an English word.

Participants who report having seen a transparent screen with a positive result in the first experiment should be invited to take part in this experiment. The safeguard considerations, touching stimuli, barriers, and procedures should be the same as described for touching a two-digit number directly. However, the warm-up procedure can be omitted in this study.

The target stimuli should be replaced by a three-letter meaningful English word in capitals. The data pool can include 1,002 different three-letter English words derived from MRC Psycholinguistic Database (http://www.psy.uwa.edu.au/mrcdatabase/uwa\_mrc.htm). A computer programme, again designed by Paul Stevens, can randomly choose the target words for producing samples using a pseudorandom sort routine.

Similarly, if participants succeed in three consecutive correct recognitions of numbers with their colours, they should be asked to describe and draw how to get answers afterward. Three hits reach significance (p < .05 binomial, one-tailed, MCE = 1/4008) when total trials are 3,270 for each participant. As a result, three hits could be a good success rate when the total trials of a participant do not exceed 3,270.

The safeguards against possible frauds in the finger-reading studies are summarized in the Appendix. This summary also can serve as a checklist while conducting finger-reading studies.

# CONCLUSION

This paper presents a modified finger-reading training paradigm under stringent conditions. The author proposes this standard paradigm in

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the hope of attracting more researchers and resources to use its safeguards and investigate the finger-reading effect. However, these finger-reading training procedures might still have limitations even under perfect safeguards. Three sources affecting ESP performance cannot be entirely eliminated. The first is the psi ability of the participants or the experimenters. Psi is a general term including both ESP and psychokinesis (PK), an ability to achieve movement by mind alone (Irwin, 2004). Participants and/or experimenters might influence each other by using their psi abilities. Given the unknown nature of psi, concerns regarding the aspect of psi influence do not appear to be of immediate importance. The second source that could affect participants' ESP performance is the experimenter's attitude of believing in psi or not (Smith, 2003; Watt & Ramakers, 2003). However, the details of how this could happen are still unknown. One possible strategy that allows this possibility to be monitored is that the experimenter's and coexperimenter's beliefs in psi should be measured. These data might later be used to develop possible explanations of the finger-reading effect. The final possibility remains of experimenters or coexperimenters cheating, whether deliberately or unconsciously. Experimenters or coexperimenters could cheat in a variety of ways, such as making detectable marks on the targets, allowing or helping participants to cheat, or even changing the records. Possibly the best way to rule out potential fraud is via replication studies by different researchers (Alcock, 2003). This is another major reason for additional finger-reading studies to be undertaken, with a more universally agreed-upon methodological approach.

The finger-reading procedures were developed from Chinese culture. One might ask whether it can be found in Western culture. Needless to say, no studies about this issue have yet been undertaken. To answer this question, the author would like to make the initial assumption that if there is such a thing as ESP, it would be a universal possibility and not culturespecific. The author is now attempting to replicate the finger-reading effect in Edinburgh. It is considered a positive effort toward cooperation for the mutual benefit of both Western and Eastern research.

Finally, although this finger-reading training paradigm has been proposed, it may have to be modified in the future due to undiscovered possibilities of fraud or newly developed machines for detecting cheating. Although such changes might be inevitable, the proposed model will still be advantageous for finger-reading studies in the long run.

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# APPENDIX

Possible frauds	Suggested safeguards
Peeking	L Black bag
	9 Barrier
	<ul> <li>3. A video camera should record the whole process and the recorded data should be examined by a different researcher to check for any peeking.</li> </ul>
	4. Experimenters and coexperimenters should make sure the cuffs of the barrier and bag are snugly tied/ fitted around the forearms.
	5. At least one experimenter and one coexperimenter should closely monitor the participant, with one positioned on each side of the barrier.
	6. Sections of a participant's arm should be exposed between the cuffs (see Figure 2b.).
	7. Participants should be told that moving the arms and pulling at the bags or cuffs are not allowed during the touching process.
	<ol> <li>8. The trial is invalid when a participant takes the stimulus out of the black bag or pulls at the tight cuffs of the barrier or bag, possibly causing openings.</li> </ol>
	9. Participants should not see any targets or their containers (small envelopes) until receiving feedback.
	10. The samples should be placed in a sealed opaque envelope to ensure that the experimenter/ coexperimenter and participants cannot see them and the envelope should not be opened until it has been inserted into the double-zipped bag.
	11. If participants want to have a break during the experiment, the coexperimenter should seal the plastic opaque bag containing samples and put it in another locked room.
	12. The experimental room should be isolated and should contain no windows, mirrors, or holes.
Experimenters – knowledge of targets	<ol> <li>Experimenters and coexperimenters should not know the contents of the target envelopes until after each trial.</li> </ol>
	2. Targets should be prepared by another researcher who will not take part in the experiment.
Randomisation	1. A target should be randomly selected as a replacement from target pools and the procedure should be specified.

Toward a Replication of the Finger-Reading Effect

Recording

Replacement

- Both experimenters and coexperimenters should keep written records of participants' responses.
- 2. All participants' responses should be recorded by a video recorder in case the need for checking any details arises.
- Before the experiment, participants should be asked to show that their hands are empty, and especially not carrying any samples used in the experiment.
- 2. The coexperimenter should always check to be sure that the black bag is empty between trials.
- 3. After the experiment, the recorded data should be checked against the original data kept by the research assistant who prepared the samples.
- 1. The production of samples should be in a standard way to minimise any tactile cues from the targets.
- 2. The stimuli, small envelopes, plastic bags, and big envelopes should be used only once.
- 3. If necessary, the samples can be checked later by another independent researcher to see if any obvious patterns were made by the person who prepared the targets.
- 4. Samples should not be used if a trial has been interrupted.
- 5. The person who prepares the targets should not have any relationship or contact with the participants or coexperimenters and should not take part in the experiment or be further involved with it in any way beyond the initial preparation of targets.
- 6. Only the research assistant who prepares the samples should be able to access the detailed information about the list of the stimuli. The information of the stimuli should be revealed only after the experiment has been conducted.
- 7. The participants should not be allowed to carry any mobile phones or radio equipment to guard against communication with any possible accomplice.

# Possible tactile cues or other cues

# NOTE: A SHORTHAND TERM FOR "PSYCHOPRAXIA"

# By Michael A. Thalbourne and Lance Storm

When Robert H. Thouless and B. P. Wiesner (1947) suggested the 23rd letter of the Greek alphabet—"psi"—to denote so-called "paranormal" phenomena, the suggestion fell on fertile ground, and "psi" is now perhaps the premier term in all of parapsychology, constantly being used as a noun or adjective (though admittedly it has never caught on among the general public).

Thouless and Wiesner divided psi  $(\psi)$  into two categories: psi-gamma  $(\psi_{\gamma})$  for mental phenomena and psi-kappa  $(\psi_{\kappa})$  for physical phenomena. Despite the advantage of a certain desirable neutrality, these two terms never caught on but rather were, we suggest, simply overshadowed and crowded out by the more famous Rhinean terms "ESP" and "psychokinesis"; "ESP" enjoys currency also among most of the general public, though the meaning of "psychokinesis" is still a mystery to most laypeople.

The senior author has been at pains to conceptualize psi as being a unitary phenomenon, to the extent that he rejects "ESP" and "psychokinesis." In their place he suggests the word and process "psychopraxia" ("the self achieving") to refer to transactions between the self and its own mind and body (endosomatic) and the self and the external environment (exosomatic). To say "psychopraxia" and leave it at that is, strictly speaking, insufficient, since it should rightly be qualified as endosomatic or exosomatic.

However, it is a huge understatement to say that the monosyllabic word "psi" is much shorter than the unwieldy expression "exosomatic psychopraxia." Moreover, "psi" has a long history, which we acknowledge. But it would be unfortunate indeed if the entire theory of psychopraxia (Thalbourne, 2004, 2005) were rejected *simply* on the grounds that "psi" (and not "psychopraxia") is the briefer term in parapsychological discourse.

In the circumstances, and initially as a form of shorthand, the second author proposed a Thouless-Wiesner type neologism which at first the first author did not accept (Thalbourne, 2005, p. 200) but which he is now seriously reconsidering. That term is "psi-pi" ( $\psi_n$ ), which neatly abbreviates the letters of the word "psychopraxia" and retains the hallowed term "psi" while suggesting a  $\pi$  relation between the self and its own mind and body (endogenous psi-pi) and between the self and the external environment (exogenous psi-pi), just as Thouless and Wiesner suggested a "gamma-relation" and a "kappa-relation" between these entities. The pirelation would imply the hypothesis that the same "self achieving" process

operates both endogenously and exogenously, no matter whether in mental contexts or in physical contexts.

We intend to use the term "psi-pi" in our future studies in the hope that its partial familiarity and relative brevity will make it considerably more attractive to parapsychologists.

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# **BOOK REVIEWS**

UNLEASHED. OF POLTERCEISTS AND MURDER: THE CURIOUS STORY OF TINA RESCH by William Roll and Valerie Storey. New York: Paraview Pocket Books, 2004. Pp. 309. \$14.00 (paperback). ISBN 0-7434-8294-8.

The long-awaited book describing the Tina Resch poltergeist case was published in 2004, 20 years after the outbreak occurred. Although reports of the case had been presented much earlier at conventions of the Parapsychological Association (e.g., Roll, 1993), to my knowledge no reports have appeared in professional journals. Much of the book consists of detailed accounts of the numerous poltergeist events, which Roll labels as *recurrent spontaneous psychokinesis* (RSPK), including the viability of conventional interpretations of many of them. It thus comes close to providing the level of detail found in journal reports of previous cases Roll has investigated (with the exception of exact measurements of the distances objects traveled, and the like). At the same time the book is obviously intended for a lay audience, and toward this end Roll collaborated with a popular writer, Valerie Storey. The result is a book that is quite readable and entertaining as well as informative, despite several instances, mentioned below, where more information would have been desirable.

The events surrounded one Tina Resch, the 14-year-old adopted daughter of Joan and John Resch, a middle-class couple from Columbus, Ohio. Tina had five adult siblings, who were no longer living regularly at the house, and Joan had taken on four much younger foster children as well. The events began on March 1, 1984, and a few days later Roll was informed of the case by Mike Harden, a news reporter for a major local newspaper. Roll, accompanied by an assistant, began his investigation on March 12. Dates and times of events are given only sporadically and it is sometimes difficult to keep track of the timeline. Particularly difficult to place is a 3-day period during which the family escaped the house to live in a motel. According to the location of this section in the text, one would think the absence occurred sometime toward the end of the 1st week of activity, but reports of disturbances in the house covered more than 3 of these days. The last day of Roll's investigation is also not stated, although the duration of the "turmoil" is given on p. 163 as 2 weeks. If this refers to the turmoil that occurred during Roll's visit, we can estimate the departure date as March 26 and the duration of the outbreak as 25 days. Tina left with Roll for the first of three visits to North Carolina, and when she returned home, there were no further disturbances.

Prior to Roll's arrival, events were witnessed (according to my count) by 17 persons (excluding the foster children), most (at least) of

whom Roll subsequently interviewed. In addition to Joan, John, and Tina, they included three of the older siblings who were visiting the house, Harden and his photographer, an electrician, two preachers, and Tina's caseworker. Events were witnessed by several more persons during two of three visits Tina made to North Carolina, including parapsychologists James Carpenter and Steven Baumann.

The case is similar to previous RSPK cases investigated by Roll in a number of respects, including, of course, the age of the focal person. I also found it strikingly similar to two published cases I investigated myself in my younger years, in both of which the focal person was not living with his or her biological parents (Palmer, 1974; Pratt & Palmer, 1976). Another dimension of similarity was the nature of the disturbances. As was true in both of my cases, movements of objects over a distance were not the first events to occur. In the Resch case, the initial disturbances were what I call "electromechanical" events, such as appliances turning on and off by themselves. The first event was the numbers on a digital clock rapidly changing on their own. There were also a couple of sightings of an apparition, described as a "dark shadow." However, the case was dominated by the usual panoply of object movements, often occurring in clusters with respect to time. Sometimes the objects were large; a particular favorite was a love seat that Tina liked to sit on. As in earlier cases, the object movements conformed to the principles of object and area focusing-the same objects and objects from the same location being repeatedly affected-as well as an inverse relation to the distance from Tina. (This, of course, is part of what defines her as being the focal person.) Roll arrived during the object moving phase and was able to observe a number of events in which Tina's whereabouts were established to be such that she could not have thrown the objects, pulled strings, or the like. In one especially hectic 52-minute period there were, in addition to 5 presumably independent sounds, 15 object movements, 6 of which Roll considered evidential. Before Roll arrived, a photographer from Harden's newspaper, Fred Shannon, accomplished the rare feat of capturing on film an object in motion, in this case a telephone receiver flying in front of Tina's body, with Tina not touching it. This photo, along with several others of Tina and other relevant persons, are included in the book.

Tina claimed that the events occurred when she was inactive but perhaps thinking of relevant things. She often complained of head or stomach aches either before or after events. RSPK did not occur when she was asleep, in locations covered by a video camera, or when she tried to produce them. In support of the latter conclusion, she failed to show significant results in a computer PK test conducted by parapsychologist Richard Broughton during her first trip to North Carolina, and she failed to produce object movements under controlled conditions during her third trip to NC. However, the authors note that this trip occurred long after the RSPK in Ohio had stopped and her motivation was poor. On the

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other hand, she seemed to show success influencing the firing rate of an in vitro snail neuron in an experiment by Baumann, but the results had to be discounted because of problems with the protocol. However, in the technical report the authors cite, Baumann reports that Tina did succeed in this task during a later visit, sans the protocol problems. I have no idea why the authors do not mention this second experiment in the book.

If Tina were the source of the disturbances, she apparently had a masochistic streak, as solid objects struck her body during one particularly active period prior to Roll's arrival and during two of her trips to North Carolina. One would expect several of these collisions to cause bumps, bruises, cuts, or other bodily injury. However, no such damage was reported. If the contact indeed caused no physical harm, this outcome itself would seem to be anomalous. It is a shame that this matter was not discussed in the book.

More than most investigators of haunts and poltergeists, Roll takes a process-oriented approach to his cases, seeking psychological and physical causes or correlates of the anomalous events. Several chapters in the book are devoted to such discussion and speculation. Roll is known for his position that RSPK is an expression of frustration felt by the focal person regarding circumstances in his or her environment. This case fits the pattern well. Joan and John Resch appear to be anything but model parents, at least with regard to Tina. First and foremost they clearly devoted more affection and attention to the foster children than to Tina. She actively rebelled against restrictions and chore assignments she considered unreasonable, and some clearly were. For example, she was forced to wear clothes to school that evoked merciless teasing and ridicule from schoolmates. Spankings by John were especially harsh and labeled by the authors as "beatings." Tina's anger was also reflected in Rorschach and TAT tests administered by psychologist Carpenter during one of Tina's trips to Durham, although it would have been better if Carpenter could have been blind to the fact that Tina was an RSPK agent.

There are also indications that Tina was dissociative. Such tendencies often result from parental abuse during childhood. In addition to the physical abuse described above, Tina was allegedly sexually abused by an older brother. I have suggested that RSPK events arise from dissociated states in which the agent is in effect a different personality. This allows the agent to create mayhem without having to feel personal responsibility for its consequences. It also helps explain why some cases are mixtures of fraud and genuine RSPK. When in the dissociated state, the agent seeks to produce mayhem by whatever means are available. RSPK is just another weapon in the arsenal, to be used along with more conventional weapons as circumstances dictate.

An EEG taken of Tina in Columbus at the early stage of the disturbances indicated no abnormalities recognizable on the surface of the brain. However, an examination by Baumann during one of Tina's trips

to North Carolina uncovered unusually fast EEG activity emanating from the pons, an area of the brainstem. The authors cite psychologist Michael Persinger's conclusion based on study of the earlier neurological reports that Tina may have suffered from Tourette's syndrome. Like the epileptic symptoms more commonly found in RSPK agents, Tourette's involves excessive spontaneous electrical discharges from the brain, which Roll sees as a cause of RSPK. Based on discussions Roll had with parapsychologist and physicist Hal Puthoff, the authors speculate further that the energy in the external environment used by the RSPK agent is something called "zero point energy," which has been found by physicists to exist in otherwise empty space.

No dramatic poltergeist case would be complete without a media circus. Harden had published a report of the case in his newspaper, followed by Shannon's photograph. At the request of the Resches, the name of the family was not mentioned. However, Harden leaked information that allowed other journalists to deduce their identity, which forced the Resches to hold a news conference in their home. The reporters hung around for several hours hoping to witness some action directly, but to no avail. Finally, Joan mentioned to Tina that the reporters needed to see something happen if they were ever to leave. Tina took the hint and clumsily faked two events, both of which were recognized as such by some of the reporters. One of them, the tipping over of a lamp, was even recorded on video. A similar fiasco occurred in one of my investigations (Pratt & Palmer, 1976). The damage such episodes do to the credibility of a case is hard to exaggerate. Although in both the Resch case and mine the fraud occurred before the investigators arrived, there is a message here for RSPK researchers: discuss with the family and/or local contact person how to handle possible media intervention during the very first phone or (e)mail communication.

Additional spice was added by the appearance of CSICOP's erstwhile debunker of things that go bump in the night, James "The Amazing" Randi. Several days after the news conference, magician Randi held an impromptu press conference of his own in front of the Resch's home, waving the eternally unclaimed \$10,000 check he offers to anyone who can show him a psychic event he considers genuine. He asked to conduct his own investigation of the case, along with two scientists from a local university. Joan was willing to let the scientists in, but Randi's usual abusive rhetoric dissuaded her from having him join them. In fact, such behavior makes one wonder if Randi expected and wanted to be denied an invitation. As the affair actually played out, he was able to make his point and garner the desired publicity without running the risk of seeing something in the house that he might not be able to explain. The scientists declined to go in alone. This is not surprising either, as Randi considers scientists to be particularly poor observers, who might not be able to detect fraud if such occurred. The scientists obviously were brought along solely to add scientific credibility to the escapade.

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Randi subsequently appeared on a panel devoted to the case at the 1984 Parapsychological Association Convention, and he later published his conclusions in *Skeptical Inquirer* (Randi, 1985). The latter was essentially a critique of Roll's investigation and Shannon's photographs. Roll and Storey devote several pages in the book to answering Randi's attack, accusing him of misrepresenting or ignoring facts that did not fit his interpretation.

An advantage of the delayed publication of the book is that it allowed for a follow-up of Tina after the disturbances in Ohio had ceased. Indeed, the book is as much a biography of Tina as the report of an RSPK investigation. As such, it resembles at times a Greek tragedy, as Tina's unhappy life got even worse after the disturbances in Ohio ceased. Several short and unhappy . marriages, sometimes with abusive spouses, culminated in the murder of her 4-year-old daughter after she had moved to Georgia to be closer to Roll, who had in the meantime moved there from North Carolina. Although the evidence clearly pointed to the father as the sole murderer, Tina was charged as well, and she actually got a longer sentence than the father did. The authors put most of the blame for this apparent gross miscarriage of justice on Tina's defense attorney, who seemed to put little effort into the case and persuaded Tina to accept the plea bargain that resulted in a life sentence rather than present in court what would seem to be a good case for her innocence. In defense of the attorney, he might have believed that the jury would not judge the case rationally, as the murder had gotten much bad publicity and stirred up a great deal of emotion in the local populace. From this standpoint, the book can also be seen as an indictment of certain American institutions that failed Tina at various times (not to mention countless other people). In addition to the well-chronicled abuses of the judicial system in the rural southern United States, one might also cite the failure of the school system in Ohio to protect Tina from the teasing and bullying she received at school. This kind of widely condoned abuse has been implicated as a motivating factor for the mass murders committed by disgruntled students at Columbine High School in Colorado and other high schools in the U.S.

A puzzling feature of the Resch case is a letter she wrote from jail shortly before the plea bargain, which suggests that she thought that if she accepted the deal she would be released in "four plus years." If that were indeed the case, the plea bargain might make sense. I was quite taken aback when I learned a few pages later that she got a life sentence. Were the terms of the plea bargain relayed to Tina before she entered her plea? Was she deliberately misled? This is another matter I wish had been addressed in the book.

However, it is the RSPK investigation that makes *Unleashed* of particular interest to *JP* readers. The evidence from well-investigated RSPK cases like this one tends to get short schrift from many parapsychologists because the events don't occur in a controlled laboratory setting. Personally, I find the evidence from such cases to be superior to that provided by various physical mediums and psychics in more controlled environments,

and on a par with that produced in the lab. This latter conclusion will strike some as surprising, but in the final analysis, the basis of decision about the evidentially of human observations (and lab experiments rely on human observation just like field investigations) is not what controls have been introduced but the likelihood of a conventional explanation of the phenomena in the context of whatever controls exist. I don't find these explanations any more plausible for good RSPK cases than I do for good PK experiments. However, in all these data sources the possibility remains of conventional explanations no one has thought of, and that is why I have taken the position that all these data should be viewed as anomalies—or "unsolved mysteries," to borrow the title of a popular American TV show that did a segment on the Resch case—rather than as decisive evidence for a paranormal process (Palmer, 1987). The latter will come only from a confirmed paranormal theory, a goal toward which Roll has made potentially important contributions.

For its part, the Resch case does not provide a whole lot that is new, but it does confirm previous observations and adds to the pool of genuinely anomalous PK data. Although from a scientific standpoint it would have been better if the report had appeared in a refereed scientific journal (which is still possible), the book is nonetheless a valuable addition to the parapsychological literature and a must read for anyone interested in scientific parapsychology.

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JOHN PALMER

Rhine Research Center 2741 Campus Walk Ave. Durham, NC 27705, USA john@rhine.org THE NEW PARADIGM: A CONFRONTATION BETWEEN PHYSICS AND THE PARANORMAL PHENOMENA by John O'M. Bockris. College Station, TX: D&M Enterprises, 2004. Pp. xxxiv + 503. \$34.95 (paperback). ISBN 0-9767444-0-6.

The New Paradigm is an encyclopedic romp through all things paranormal as well as things otherwise disturbing. Its author, John Bockris, is a physical electrochemist who has served on the faculties of the University of Pennsylvania, Flindeers University of South Australia, and most recently Texas A&M University. He has published 22 books and over 700 papers in fields related to physical electrochemistry.

The book opens with a foreword by Larry Dossey, a physician and well-known writer specializing in spiritual healing. Dossey laments the rise of scientism (the view that modern science knowledge and theories provide a more or less complete understanding of the universe). Dossey draws a distinction between logos, the practical and logical approach to understanding reality that he perceives as underpinning modern science, and mythos, the direct or mystical mode of understanding the nature of the universe and the purpose of life, which Dossey sees as underpinning the religious mode of understanding the world. Dossey notes that both logos and mythos derive from the common urge to understand the universe directly (in the case of mythos, the understanding is mystical, intuitive, and direct and is unmediated by religious authority). He observes that many important scientific discoveries have taken place during dreams, so that, in fact, science too relies on mythos. Dossey notes that under modern scientism, logos has been elevated to the lofty status once held by mythos during the era of widespread theocratic states.

In the main text of the book, Bockris notes that dissent from scientific orthodoxy is strongly suppressed, citing the examples of Ignaz Semmelweiss, Rupert Sheldrake, Wilhelm Reich, and his own firing by Texas A&M, which was prompted by his claim to have discovered an inexpensive process yielding hydrogen fuel, his support of claims of cold fusion, and his research on nuclear transmutation. He also cites Dean Radin's termination by the University of Nevada, which Bockris attributes to Radin's publication of a popular book on parapsychology.

Bockris provides a sweeping review of all things heretical to modern science, including cold fusion, intelligent design, UFOs, homeopathy, crop circles, morphic resonance, orgone therapy, and ESP, among many other topics too numerous to list here. The book includes discussions of sociological topics, such as teen pregnancy and affirmative action, as well.

He endorses Nietzsche's conclusion that "Science is the new Religion of the West" (p. 16). He predicts that many tasks now performed by humans will be taken over by computers in the near future. He further predicts that 90% of the human population will not have to work and that most of the remaining jobs will be at the top and the bottom of the income hierarchy, which will have a negative impact on the displaced workers.

He asserts that affirmative action has weakened American culture and that the general population's knowledge of science has declined. However, he still sees science as the dominant force in modern culture, and he concludes that science has led to a materialistic, amoral, and hedonistic culture.

He discusses the anthropogenic deterioration of the environment, putting his emphasis on the role of the "third world" in creating this environmental degradation (although he does acknowledge the role of technologically advanced countries).

He discusses the decline of family values, sometimes making sweeping statements while providing little in the way of hard evidence to back them up. He proposes that the sale of certain types of music that are contributing to the corruption of young people be outlawed.

Toward the end of the book, Bockris concludes that democracy is not conducive to reversing the decline of the environment and the depletion of natural resources.

Bockris next turns to evidence for Intelligent Design. He reiterates the claim that the flagellum of microorganisms and the mammalian eye represent cases of irreducible complexity (i.e., the removal of a part destroys the function of the whole), indicating that such organs could not have been evolved from chance mutations. However, one can rather easily imagine how, say, light-sensing cells could evolve into the more complex form of the eye over time (indeed the evidence indicates that the eye has evolved several different times independently in the course of evolution on Earth). Similarly, one can easily imagine a rudimentary flagellum serving as a "rudder" prior to evolving into a whip-like propulsion device.

Bockris also presents the somewhat lesser known example of the "backfire beetle," which possesses two sacs, one of which contains  $H_2O_2$  and the other anthroquinone. The two chemicals are harmless by themselves but when mixed upon expulsion become scalding hot as they are squirted at an enemy.

Somewhat later, Bockris essentially denies that species evolve from one another. Bockris asserts that there is no evidence of transitional forms in the fossil record. He notes that the accepted view is that modern humans have been around for only 100,000 years and disputes this by citing anthropological evidence that *homo erectus* existed millions of years ago. The obvious place where this argument breaks down is that modern humans are not members of the species *homo erectus*. He cites evidence put forth by J. D. Whitney that modern tools found in a California gold mine are 9,000,000 years old, noting that Whitney's paper was rejected for publication by establishment journals because his findings were inconsistent with the orthodox time line. On a related note, he states that the creatures known as Sasquatch (more popularly termed Bigfoot) "are surely the remaining Neanderthals," who have retreated into the wilderness to hide from modern humans (p. 84).

Bockris next directs his wrath at Einstein's theory of relativity. He appropriately laments the deification of Einstein at the expense of other leading physicists and mathematicians who made crucial contributions to the development of this line of reasoning. He notes that several experimental findings contradicting the Michelson-Morley experiment showing the absence of absolute motion have been suppressed by the scientific establishment. In his presentation of the mathematics of Einstein's theory, central equations are omitted and some equations occur out of order in the text.

He next rejects the Big Bang theory, noting that galactic redshifts can be accounted for in terms of the loss of photon energy produced by collisions with particles in "empty space." On page 137, he asserts that photons have mass, whereas photons are regarded as massless particles in modern theories of physics. He notes the establishment's denial of telescope time to Halton Arp, a prominent astronomer who challenges the Big Bang theory. Bockris also notes that the apparent age of many galaxies is greater than the amount of time since the Big Bang. This certainly was a problem for cosmological theory a few years ago (and possibly even in 2004 when Bockris wrote the book), although the most recent estimates indicate that the universe is slightly older than the galaxies that inhabit it (which is a good thing if you are rooting for the truth of modern astrophysics).

Bockris notes that there are many obstacles to a scientific explanation of the origin of life, claiming that the evolution of DNA by chance is impossible. He states on page 144 that DNA is constructed of chains of four types of amino acids. In this, he is incorrect. DNA is constructed of four types of nucleotides. A sequence of three nucleotides comprises a codon. Each of the 64 possible codons corresponds to an amino acid during the synthesis of proteins. He cites Chandra Wickramasinghe's argument that the age of the universe is too short for even a five-amino acid protein to evolve. Incidentally, Wickramasinghe's name is spelled as "Wickrisingam" on page 146, as "Wackrisingham" on page 147 and as "Wackrasingham" on page 150 (and to the best of my memory never spelled correctly). As discussed in more detail later, this is just one example of the numerous typos and other errors in this poorly edited and proofread book.

Bockris next turns to parapsychology. He cites favorably studies in which practitioners of transcendental meditation (TM) have ostensibly reduced death and crime rates and have enhanced quality of life in large populations, as well as claims that TM adepts can levitate. He cites favorably (and uncritically) research on psychic surgery, the alleged phenomena of Ted (PK-man) Owens, appearances of the Virgin Mary, the claims of Carlos Casteneda, electronic voice phenomena, the SORRAT minilab, the claims of astrology, and the materialization phenomena of Sai Baba (whom he compares to Christ on page 396). He presents the lesser-known case of the Brazilian pharmacist Thomaz Green Morton, who allegedly can change Brazilian currency into American currency or change the denomination of a bill (a handy talent indeed). Morton has also allegedly been observed to change a hunk of raw beef into a collection of live crickets.

Bockris describes his own personal encounters with a poltergeist. Among the phenomena observed were a ringing of Bockris's door chimes in Australia that coincided with the death of his wife's former husband, spontaneous fires breaking out on his property, strange jets of water, sightings of a strange large black dog, and, perhaps most ominously, the apparent materialization of a half eaten ham sandwich (complete with plate) on Bockris's bathroom floor. No ham was ever purchased for use in Bockris's house.

In describing the research on dream telepathy at Maimonides Medical Center, he states that the judges were asked to score every dream as either a 0 (a miss) or a 1 (a hit). In fact, the judges rank-ordered all the pictures in the target pool. In connection with out-of-body experiences (OBEs), Bockris proffers the unwarranted conclusion that "when a person says she had an OBE, she has control of an entity with the ability to read and bring back new data" (p. 304). Bockris hypothesizes that the purpose of OBEs and UFO sightings is to challenge us to reject materialism.

Bockris concludes that "Consciousness cannot be centered in the brain because of the finding that persons who have suffered removal of large portions of the brain retain memory and are intellectually able" (p. 463).

Bockris next turns his attention to cosmology. In connection with the Anthropic Principle (the notion that the universe was designed to support the presence of conscious observers), he cites a calculation by Roger Penrose that the probability that a universe with randomly selected properties could support life is 10<sup>-121</sup>. With regard to quantum nonlocality, he states that experimental results prove that "an immaterial entity" passes between correlated (i.e., quantumly entangled) electrons at the time of measurement (p. 441). However, the results on quantum entanglement are generally attributed to the nonlocal nature of the quantum mechanical wave function and the particles it governs. In fact, the "immaterial entity" proposed by Bockrisseems more material than does the by-now "orthodox" position that quantum objects have nonlocal properties (not that anyone really understands the ontological implications of this "orthodox" model).

Bockrisstates that the evolution of plants and the resulting emission of oxygen into the atmosphere leading to the formation of a protective ozone layer is a "significant example of purposefulness and design" (p. 446). Bockris concludes that the "Creation has the purpose of making an environment suitable for the development of human beings" (p. 446). However, not even the most ardent proponents of the Anthropic Principle (with the obvious exception of Bockris) subscribe to such a species-centered interpretation. On the last page of the text, Bockris states: "In writing rather overconfidently about such matters, I may be going a bit too far too fast" (p. 484). This sentence sums up the primary problem of his book. He endorses a great number of outlandish hypotheses in telegraphic fashion without thoroughly presenting the empirical evidence for them and, more importantly, without discussing the reasons why most scientists reject these claims. He states hypotheses baldly and expects the reader to accept their veracity solely on the basis of his word. He jumps from topic to topic throughout the text, often repeating himself. While he exhibits exposure to vast regions of knowledge, the evidence suggests that he has made too great a sacrifice of depth while expanding the breadth of his knowledge. A small sampling of the errors strewn throughout the book appears below:

- He systematically misspells biologist Richard Dawkins's name as "Richard Dawkin" (e.g., p. 75).
- He misspells the philosopher George Berkeley's last name "phonetically" as "Barclay" (e.g., on p. 122).
- The astrophysicist Martin Rees's last name is spelled "Reece" (p. 154).
- Cepheid variables are called "cephed variables" (p. 155).
- The hypothetical astrophysical entities called "branes" are misspelled as "brains."
- He uses "ECG" in his description of an OBE experiment by John Palmer, whereas "EEG" is clearly meant.
- Hubert Pearce, one of Rhine's most notable subjects, is called "Hunter Pierce" (p. 220).
- Alan Vaughn's first name is misspelled as "Allan" (p. 287).
- The Russian psychic Nina Kulagina's first name is given as "Galina" on page 377.
- He states that membership in the American Association for the Advancement of Science is open only to elite scientists with outstanding publication records, whereas this organization is open to anyone willing to cough up the modest membership fee; here, Bockris must be thinking of the National Academy of Sciences.

This list covers only a small fraction of the errors in this book. Bockris has obviously read far and wide, yet his knowledge seems stretched thin in places. He flits about from one topic to the next, with discussion of particular topics broken into pieces and strewn throughout the book. He telegraphically states the findings of paranormal research without much discussion of the possible weakness and shortcomings of this evidence. As a result, this book does not provide the reader with a well-balanced and detailed examination of the evidence for the paranormal claims being put forth.

The book contains footnotes for each chapter (in lieu of a bibliography) and provides a very sketchy index.

For the reader seeking a comprehensive introduction to paranormal topics, I would recommend looking elsewhere. For the scholar, Bockris's book does not delve deeply enough into the pros and cons of the hypotheses he discusses (and proclaims true by fiat), and the large number of errors render it an unreliable resource for the serious scholar.

DOUGLAS M. STOKES

424 Little Lake Drive, #3 Ann Arbor, MI 48103 dougstokes@sbcglobal.net Is THERE AN AFTERLIFE? A COMPREHENSIVE OVERVIEW OF THE EVIDENCE by David Fontana. Ropley, I lants, U.K.: O Books, 2005. Pp. 496. \$19.95 (paperback). ISBN 1 903816 90 4.

This book is subtitled "A Comprehensive Overview of the Evidence," and in some ways it is just that: All the major areas of survival research conducted over the past century are addressed. In other ways, however, it is not comprehensive. Authors, of course, must choose and emphasize the areas that they consider most important, and no one can fault David Fontana for doing that. But his disproportionate emphasis on the areas of research and individual cases that he prefers means that persons coming to this book with little or no prior acquaintance with survival research—the audience for whom this book was apparently intended—will not get a representative and balanced picture of the scope and quality of much of survival research. Moreover, although there are many good summaries, especially of individual cases, the numerous errors and misprints in the book—some trivial, some not—may undermine, justly or unjustly, the confidence readers are likely to feel in the overall quality of the presentations.

Fontana begins by appropriately defending the importance of spontaneous cases and the general reliability of eyewitness testimony, and he dismisses "the myth of eternal progress" (p. 8), that is, the assumption that the more recent some piece of evidence or research is, the better it must be. Throughout the book he discusses the ongoing controversy about super-psi versus survival interpretations, but in the introductory chapter he points out (as others have before him) that the evidence for psi from experimental studies supports the survival hypothesis indirectly by demonstrating that mind can operate beyond the normal boundaries of time and space. Regrettably, his brief review of the experimental evidence for psi suffers from a weakness encountered throughout the book, a lack of references to which readers can go for more information.

In the next chapter Fontana discusses apparitions, giving good summaries of some crisis cases, collective cases, and cases in which the apparition gives information not previously known to the percipient. Some of the cases are published, and some are more recent cases reported to Fontana (most of them previously unpublished). Similarly, in the chapter on hauntings and poltergeists, he concentrates on describing a few examples, particularly the interesting Cardiff case that he investigated. Unfortunately, in focusing on isolated cases, Fontana gives little indication of the volume and quality of the evidence from apparitions collected by the SPR. particularly as reported in Phantasms of the Living, in the Census of Hallucinations, and by Eleanor Sidgwick. Nor does one get a sense of the numerous reports of poltergeist and haunting cases, the complicated phenomenology of many cases, and the quality of some of the investigations, such as one finds in books such as Gauld and Cornell (1979), Owen (1964), Roll (1972), and Thurston (1953). Moreover, in these chapters we begin to encounter a problem that recurs throughout the book: There are frequent and irritating mistakes, including numerous misspellings of some of the most important names in psychical research. For example, on page 33 a citation to Phantasms reads "Sidgwick et al 1886" (it should be "Gurney et al. 1886"). Some citations in the text are missing in the reference list. The references for the Census on page 54 are to two brief preliminary reports by Sidgwick but not to the final and massive report by Sidgwick and his colleagues (Sidgwick et al., 1894); moreover, even the two references given are incomplete. Gurney becomes "Guerney," Frederic (or F. W. H.) Myers becomes "Frederick" (or "F. H.") Myers, Gauld becomes "Gould," Tyrrell becomes "Tyrell"; later McDougall becomes "MacDougal," and Michael Sabom becomes "Martin" Sabom. Even Fontana's own name is misspelled in the foreword!

In chapter 4 we find a sympathetic presentation of the Enfield poltergeist case, but there is practically no mention of the misgivings about the case raised not by uninformed and hostile critics but by highly informed, sympathetic, and experienced investigators such as Alan Gauld and Anita Gregory. Fontana may be right in his assessment of the case. I have no intention of entering into the fray myself, but a balanced presentation would seem to require some mention of the criticisms made by knowledgeable people.

The chapters on mental mediumship are more satisfactory. There are good summaries of the research on Mrs. Piper, Mrs. Leonard, and Mrs. Garrett. The cross-correspondences are illustrated by a description of the Palm Sunday case, and proxy cases by a good summary of the Bobbie Newlove case. The Edgar Vandy case, called by Fontana "one of the best examples" of a proxy case (p. 190), is indeed a great case, but not, for the most part, a proxy one. Drop-in cases are illustrated by descriptions of the

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Harry Stockbridge and Runki cases. Fontana also includes a discussion of the Patience Worth case under the heading of drop-ins, although Patience Worth has never been identified as a real person. The case better illustrates the difficulty, which Fontana briefly discusses, of deciding whether and when material is coming from a real deceased person and when it is coming instead from the medium's untapped reservoirs of creativity or other latent capacities (for a more complete discussion of this case and this issue, see Braude, 2003, chapter 5). Fontana's discussion of drop-in cases becomes problematic for me, however, when he turns to what he calls "misleading drop-in communicators" (pp. 166-175). These are the numerous instances in which the communicator has not been identified because no attempt was made, or the material given was insufficient for an attempt to be made, or the information given was for the most part erroneous, with perhaps a few scattered correct details. Here and elsewhere in the book Fontana raises the possibility that such "drop-ins" may be "mischievous earthbound spirits" who need to be "encouraged to move on" (pp. 170-175). Such speculation seems at best highly premature.

Fontana's primary interest, clearly, is in physical phenomena, and 150 pages are devoted to these. There is first a chapter on the direct voice phenomenon, with descriptions of four mediums for whom the phenomenon was claimed. The emphasis given this phenomenonalthough understandable in light of its connections with the electronic voice phenomenon, also of great interest to Fontana-seems unwarranted. Despite some interesting and puzzling details that have emerged during direct voice sittings, there is little compelling evidence for direct voice itself, as far as I am aware. Fontana says (p. 233) that "we have a large number of audio tapes of the [direct] voices" of Leslie Flint, but unfortunately he doesn't say who "we" are, where these tapes are, and who has listened to and evaluated them. And I am unaware of any other such recordings. More importantly, it is difficult to draw any conclusions about the origin of the voices without instrumentation that might help pinpoint this. Fontana refers (pp. 235-236) to a test in which a throat microphone was used and purportedly ruled out that Flint's vocal chords were involved in the production of the voices. Again, however, he provides no reference to any report of this test. There is also no good documentation for any of the claims that foreign languages have been spoken under these circumstances. Fontana would have done far better in this regard to discuss such xenoglossy cases as the Sharada casea case that has been heavily documented and moreover does far more to support the survival hypothesis than these direct-voice cases do. Nowhere in the book, however, is the Sharada case even mentioned.

In two additional chapters on physical mediumship, Fontana describes the well-known cases of D. D. Home, Eusapia Palladino, Florence Cook, Stella Cranshaw, Mina Crandon, Helen Duncan, and Indridi Indridason (whom Fontana calls "Indrid"), and he ends with a long summary of an investigation in which he participated, that of the Scole

circle. In some of these cases, it seems likely that something paranormal was going on, but is any of this evidence for survival? There is little evidence linking the phenomena to a known deceased person, and claims of materializations, whether of known or unknown persons, are questionable at best. Occasionally information is given that apparently goes beyond the knowledge of the mediums or others present, but this is mental mediumship. Fontana's primary argument for the relevance of physical phenomena to survival seems to be that because the physical phenomena produced at seances are not seen under other circumstances in the medium's life then "the phenomena were produced by energies other than her own" (p. 286). This argument seems spurious to me since it is likely that the atmosphere as well as the expectations generated at a seance are much more conducive to paranormal phenomena, including PK, than are most other circumstances in the medium's life. Fontana further argues that because the makeup of the group sitting with the medium usually varies, then the phenomena were not likely to have been generated by any individual sitter's PK abilities. Thus, the idea that they were generated by deceased persons "is not an unreasonable one" (p. 286). There is no mention, however, of Batcheldor and his suggestion that the success of his sitter groups in generating physical phenomena was not because of one individual but because of the group dynamic, a dynamic that can continue despite variations in who is present.

Fontana provides long discussions evaluating the pros and cons in cases of physical mediumship that have aroused much controversy, such as that of Mina Crandon ("Margery") or of Helen Duncan, and long discussions defending the paranormality of many individual events and phenomena, particularly in the Scole case. I must admit, however, that I have grown quite tired of and exasperated by such debates. They seem to get us nowhere and simply solidify the opposed positions. What is needed is not more debate over previous observations but better, and better documented, evidence. Fontana admits that he and his coinvestigators in the Scole case were unable to introduce the control conditions they wanted, such as infrared cameras, because "their [the circle members] primary purpose was not to satisfy us" (p. 326). The usual excuse given-that light is somehow damaging-raises suspicions and has also become quite wearisome to me. If Home could do it in good light, why not others? Fontana also laments the suspicion of thoselike me-"who have never experienced these phenomena for themselves" (p. 327). That, however, is exactly what science is for-to provide evidence sufficient to convince those who have not experienced something for themselves, whether that be a bending spoon or the Big Bang.

The chapter on electronic voice phenomena (now often called Instrumental Transcommunication, or ITC) is similarly inconclusive. The criticisms Fontana himself makes seem to summarize the current state of this research: First, experiments have not been carried out under conditions suggested and controlled by outside observers, and second, the available reports usually lack the details about procedures and results necessary for an informed conclusion. Perhaps the most pressing need is for independent observers to listen to recordings—without, of course, being told what is purported to be on the tape—and report what they hear.

The chapters on NDEs, OBEs, and reincarnation research seem almost an afterthought. They are brief, and virtually none of the citations in the text of the NDE and OBE chapters have corresponding items in the reference list, so readers new to these areas and wishing more information will have a difficult time. The short chapter on reincarnation research is also strangely skewed. Seven pages are devoted to hypnotic regression cases, but Fontana fails to point out that, although there are a few evidential and impressive regression cases, the vast majority lack any verified, or even verifiable, details. There are as many pages devoted to the single case of Jenny Cockell-a decidedly weak case, I think (for reasons there is not room to go into here)—as to the 45 years of research of Ian Stevenson. With regard to the latter, again the reader gets no sense of the vast quantity and quality of the research; for example, there is no discussion whatever of the important and large body of birthmark and birth defect cases documented in Stevenson's Reincarnation and Biology (1997).

The final chapter addresses the question of the nature of the afterlife, and for this Fontana draws on information he has derived from mediums, the various spiritual traditions, NDE experiencers, and ITC recordings. He may be right in concluding that there is a "marked degree of consensus" across the various accounts, although I suspect that the picture is far more complicated than this brief chapter suggests. Even if there is such consensus, however, it would seem that much more study and analysis must be done before we can conclude that the consensus derives from some reality above and beyond the known physical world rather than from the milieu or "zeitgeist" in which mediums and others operate, or from the interactions and influences of the various traditions on each other.

I do not mean to be unduly critical, and despite my harsh comments there is much to admire in this book. Survival research is a vast subject with an enormous literature, Fontana has clearly immersed himself in that literature, and in many areas he presents good and useful summaries of cases and lines of research. The gaps, the errors, and the lack of references will unfortunately make it difficult for readers new to the topic to judge the overall quality of survival research for themselves. For that they might consult, among many possibilities, Braude (2003), Gauld (1982), or Hart (1959).

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IS THERE LIFE AFTER DEATH: AN EXAMINATION OF THE EMPIRICAL EVIDENCE by David Lester. McFarland, 2005. Pp. 250. \$39.95 (paperback). ISBN 0786421169.

The back cover of this book informs us that the book objectively examines the large body of empirical research devoted to answering the question of whether there is life after death. This is professedly done by

> drawing together the observations of social science regarding such phenomena as reincarnation, near death experiences, deathbed visions, cases of possession by dead spirits, and apparitions of the deceased. It considers possibilities including survival of consciousness and survival of personality, and reflects on the logical problems inherent on any model of post-mortem survival.

Exclusive of notes, bibliography, and index, the book numbers 214 pages, of which the first 26 are preface and expositions on religious views of life after death, and who in fact believes in life after death. The next 63 pages are devoted to the near-cleath experience, followed by 53 pages devoted to the task of examining the case for and against reincarnation. The last 50 pages are all about assessing the relative strength of empirical data associated with apparitions of the dead, (16 pages), widow hallucination (3

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pages), deathbed visions (5 pages), possession (10 pages), mediumship (6 pages), poltergeists, (2 pages), and a concluding section entitled "Is there Life After Death?" (7 pages).

The author asserts that the major empirical sources of evidence for life after death are from near death experiences and research on reincarnation. Based on his analysis of both evidential sources, he concludes that the research reviewed fails to provide convincing evidence for the belief in life after death.

The lion's share of the work is devoted to assessing the relative merits of the empirical research associated with the near death experience and the research on reincarnation. The author, in his skeptical conclusion, asserts that both appear to be affected to a large extent by cultural factors and that both sets of research were instigated a long time after the events. He thinks this seriously weakens the results of the studies. With regard to reincarnation he is also skeptical because nobody has explained what the surviving personality does between reincarnations, how it can happen, and by what mechanism and for what purpose it happens. He also thinks the evidence from near-death experiences seriously undermines the hypothesis of survival because, among other things, the medical condition of the subject affects seriously the nature of the experience.

This is certainly not the place to enter into a detailed and critical assessment of the author's conclusion and the arguments offered for it. However, for several reasons, I found the work disappointing. The author has not read enough on either reincarnation or near-death experiences to focus on the best cases available. Nor are his analyses probing or careful. He has also misconstrued or ignored too much of what others have said about the force of the reincarnation and near-death cases. For example, the objections he raises to both major bodies of research have been posed and painstakingly answered elsewhere, and there are more interesting objections that have found their way into the literature (see, for example, Braude, 2003, and Almeder, 1992) but which are here neglected. In fact, some of the alternative explanations posed for the reincarnation data (Braude's super-psi hypothesis or Hales's ET hypothesis, for example) are considerably more interesting and important than any he brings up, and they are carefully discussed in the literature. This book does not advance the discussion of the evidence from either reincarnation or near-death experiences.

Very few will take seriously the author's objection to reincarnation based on the assertion that we do not know how or by what mechanism it occurs, or where the deceased personality goes in between reincarnations, or what exactly survives. One can frequently know that something occurs without knowing how or why. As for what survives, it is what is essential to a human personality (however we may ultimately characterize it) without being directly or indirectly reducible to some neuro-biological state or any other property of the brain. Moreover, the evidence does not imply
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anything about what personality is or that everybody in fact reincarnates. Nor does the evidence show why or how reincarnation occurs. It does not imply any form of karma. In addition, the author's so-called *cultural objection* to near-death or reincarnation evidence clearly does not apply in cases known to have occurred in America, England, or Australia. The author is also simply wrong for thinking that many others from different cultures have not reported cases similar in strength to the best cases offered by Stevenson and others. Further, with respect to the near-death experience, he might have instead taken a close look at the literature wherein near-death experiences co-relate with demonstrable knowledge the person has of events taking place elsewhere while he or she is in that state, knowledge that could not possibly be explained by the hallucination hypothesis. Finally, the evidence is actually quite strong in voluntary outof-body experiences as, for example, in the experiments performed by Osis and McCormick (Almeder, 1992).

This is neither a scholarly work nor a probing work. But, doubtless, some people will find it engaging as a readable description of much of what goes on in these two basic areas, bypassing the fact that the data are seriously incomplete and in spite of the fact that the author is not equipped to analyze with any logical rigour the various crucial objections and replies in the wider discussion of the data.

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THE RELUCTANT SPIRITUALIST: THE LIFE OF MAGGIE FOX by Nancy Rubin Stuart. Orlando, FL: Harcourt, 2005. Pp. xiii + 393. \$25.00 (hardback). ISBN 0-15-101013-7.

In 1848, in the town of Hydesville, New York, not far from Rochester, the sounds of disembodied rappings were produced in the presence of Maggie and Katy Fox, and then of their older sister Leah. These sounds were promoted as having been made by spirits telegraphing communications to the living and did more than anything else to precipitate "modern Spiritualism" from the religious atmosphere of the time. Recently three books have been published on the Fox sisters, suddenly filling in a gap of three decades since the last substantial biography of the Foxes appeared. Nancy Rubin Stuart's book is the latest, but the previous year saw the publication of Barbara Weisberg's *Talking to the Dead: Kate and Maggie Fox and the Rise of Spiritualism* and David Chapin's *Exploring Other Worlds: Margaret Fox, Elisha Kent Kane, and the Antebellum Culture of Curiosity.* All three appear to have been in production at the same time. None of them refers to the others.

The similarities between Stuart's book and Weisberg's are strong. The authors received help in their research from many of the same people and consulted many of the same sources. Each of these authors is a former television producer who felt drawn to one of the Fox sisters—in Stuart's case, to Maggie; in Weisberg's, to Katy. Nevertheless, each of the books portrays the Fox sisters and their relatives and friends in a different light. While Weisberg's book is focused on the entire Fox family and on the growth of spiritualism, Stuart's places Maggie Fox in the center and spends less time on the other members of the Fox family and on the larger history of spiritualism. In Stuart's book, Maggie (Margaretta) is the instigator of the rappings; in Weisberg's, it is Katy (Catherine). Stuart portrays Maggie as a tragic figure and has Katy as a clever but less sympathetic character. She describes the girls' mother, Margaret, as naïve, soft, and permissive. The girls' father John, she says, was a shiftless drunkard who deserted the family after Leah's birth but then reformed himself into a humorless, teetotal Methodist, rejoined his family, and sired Maggie and Katy.

In Stuart's book, the girls' older sister Leah (Ann Leah) is a relentless, ambitious impresario of her younger sisters, careless of their welfare, responsible not only for turning them into puppets under her control but also for being the "leading force behind the rise of American spiritualism." For Stuart, Maggie's story as a spirit medium is that of her struggle for autonomy against her older sister and against her enthusiastic public.

The particular strength of Stuart's book over all others is her detailed portrayal of the relationship of Maggie to her suitor and (perhaps) husband, Arctic explorer Elisha Kane. For previous biographers, Kane was simply a cad who compromised Maggie. He never had the courage or perhaps even the inclination to marry her but led her on because of his thoughtless fascination with the wild mystery of her powers and his insouciant conviction, born out of his family's social status, that he would tame her as if she were a wild animal.

Stuart, however, analyzing the same letters between the two lovers that other biographers have used, seesirony, playfulness, and mutual regard. She suggests that Maggie and Elisha were equally matched in some sense, pointing to Maggie's letters in which she counters Kane's disapproval of her mediumship by listing some of the intellectuals and scientists who had come out in favor of spiritualism. Stuart's treatment of the lovers' relationship is

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complex and persuasive, making it easy to understand why Maggie would have fallen in love with Elisha, as well as why his death left her unreconciled to her future without him. Stuart's assessment of character and motive is more complex and consistent than that of previous biographers. She also ventures into considering Maggie's conversion to Catholicism and how this affected her spiritualist practices.

Stuart's book, however, sometimes moves out of its narrative of the Fox sisters' lives into a broader picture of spiritualism and of the religious movements of the time, but when it does, it suffers from mistakes. Stuart says twice that Emma Hardinge married ex-Universalist minister and spiritualist author and editor Samuel Byron Brittan, and she gives Brittan's middle name as "Bryan." In fact, Emma married physician William Britten.

Stuart calls Charles Chauncey Burr "Reverend" but puts quotes around the word, as if his credentials were questionable. But he was indeed a Universalist minister, although no longer making his living as such when he began his anti-rapping crusade. She calls his brother "Raymond," but his name was Heman. She gives Daniel Dunglas Home's middle name as "Douglas." She refers to Ira Davenport as "John." She misspells Alfred Russel Wallace's middle name as "Russell." She mentions that Abraham Lincoln attended a séance given by medium Nettie Colburn Maynard, but Nettie did not become Mrs. Maynard until some years afterward. In the bibliography, Stuart links *Ballou's Pictorial* to Adin Ballou rather than to Maturin Ballou. She cites Benjamin Hatch's book as *Spiritualists' Inequities Unmasked* rather than *Spiritualists' Iniquities Unmasked*. She describes the spiritualists' memorial to Congress in 1854 asking for an investigation into the rappings but does not seem to realize that the petitioners believed they had been betrayed by Senator Shield's mockery of the subject.

Stuart needed a more attentive editor. Typos appear—there is one even in the first sentence of chapter 1. And there are points of imprecision. She writes that "to literalists, spiritualism's true spark came in 1848 from something no more or less powerful than a bored teenage girl." But "literalists" is surely not the right word. She writes that several doctors "who ascribed [sic] to the healing claims of Andrew Jackson Davis, had become spiritualist converts," but should have used "adhered" or "subscribed" instead of "ascribed."

Stuart repeatedly describes those who, beginning in 1848, were interested in the Fox sisters' rappings and in forming spirit circles as converting to "spiritualism" or as becoming "spiritualists." But, apart from John Bovee Dods's idiosyncratic use of the word "spiritualism" to designate the psychological states he induced in his mesmeric subjects in the early 1840s or the older use of the word to mean simply something like "religion," "mysticism," or the opposite of "materialism," the word "spiritualism" was not used before 1852. Only after the rappings had been linked with the evolutionary cosmology and "harmonial philosophy" of Andrew Jackson Davis and various radical Universalists and Quakers was this later amalgamation given the name "spiritualism" and its adherents called "spiritualists."

Unlike Weisberg, who sometimes seems diffident about her material, as if she were floating just above the narrative, presenting details but unwilling to say not only what we ought to make of the girls' characters but also what actually happened, Stuart places the reader into the characters she has struggled to understand and whose inner motivations she has sought to make coherent and lively. One may wonder, however, whether any biographer of the Foxes will ever have enough material about the girls' early years and the events at Hydesville to offer a completely confident assessment of them.

Has the key to the Fox girls' characters been found? Stuart, like Weisberg, is dissatisfied with earlier interpretations of the girls' motives and actions that blame them for simple fraud, although both admit that the girls, even when young, were high-spirited and mischievous. Stuart is not sympathetic to the spirit hypothesis but still warms to the girls as feminist heroes, as strugglers for personal autonomy under oppression.

Nevertheless, even if we simply take the evidence presented, Kate and Maggie and Leah's behavior appears to be inexplicable unless they were not just acted upon by others but were also-at least intermittently-vigorous, calculating actors in the dissimulation that their mediumship entailed, proud of their skills, coolly reserved about their methods, and willing to proselytize for the spirits, even from the beginning of the rappings in 1848. Stuart mentions that Maggie and Katy's confessions to their mother that the rappings were fraudulent affected her mind and hastened her death. But even this does not lead Stuart, perhaps in reaction to earlier biographies, to place much, if any, blame on the girls for perpetrating a colossal imposture; she prefers to excuse them on account of their immaturity, frozen and extended into their adulthood. She does not much ponder what evil may have been wrought in others by "lying spirits" contacted by the Fox girls, even though the girls themselves, rising out of drug and alcohol stupors later in their lives, were bold enough to do so and to struggle fitfully to make amends. The reader is left with the impression that the Foxes' recent biographers may admire the girls more than the girls admired themselves.

To be culpable for evil or praiseworthy for virtue requires a self that is a real agent which can inherit the consequences of previous acts. But some of the most radical of the nineteenth-century spiritualists were also some of the earliest devotees of positivism. The positivist basis for contemporary academic writing encourages writers to treat perduring personalities as epiphenomenal illusions and to treat agents as mere momentary intersections of more fundamental forces and matter. So Stuart's conventionally configured biography is different from David Chapin's academic book, which is not precisely *about* the Foxes but rather about "the Antebellum culture of curiosity," with Maggie Fox and Elisha Kane figuring as illustrations and their lives figuring, formally speaking, only as anecdotal Book Reviews

data points. His subjects also include class and gender, with the Fox and Kane families figuring as illustrations of oppressed and oppressor.

Ordinarily, a popular biographer, whose subject is a person, can ignore such recondite matters of academic philosophy as what constitutes a real agent. But that question comes to the fore very insistently in a biography of a spiritualist medium. The spiritualist pioneers of the nineteenth century demonstrated the tenuousness of the self—its fragmentary nature, its multiplicity, its capacity for displacement or even disappearance. Who could blame the mediums for what they did or said when their bodies no longer held them but held instead someone or something else?

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# CORRESPONDENCE

To the Editor:

I recently read—and enjoyed—Cooperand Thalbourne's article (*JP*, **69**, 139-150), which detailed a study that sought to test various predictions of McClenon's Ritual Healing Theory (e.g., McClenon, 2002). While I am pleased to see that researchers are examining this theory and investigating the relationships between anomalous experiences and hypnosis-related variables, the paper suffers from a number of conceptual shortcomings regarding hypnosis that I believe were not sufficiently addressed.

The primary item in the paper with which I would like to take issue is Cooper and Thalbourne's use of the Experience Inventory (Ås, O'Hara, & Munger, 1962) as a measure of hypnotic suggestibility. In its definition of hypnosis, the Society of Psychological Hypnosis (Division 30 of the American Psychological Association) states that hypnosis occurs when "one person (the subject) is guided by another person (the hypnotist) [or by themselves as in individual hypnosis] to respond to suggestions for changes in subjective experience, alterations in perception, sensation, emotion, thought or behavior" (Green, Barabasz, Barrett, & Montgomery, 2005, p. 262). Hypnotic suggestibility, or hypnotizability, is measured with group or individual scales including successive suggestions of increasing difficulty following a hypnotic induction (e.g., Bowers, 1993; Shor & Orne, 1962; Weitzenhoffer & E.R. Hilgard, 1962). The Experience Inventory, however, is a psychometric measure that queries respondents about a number of experiences and cognitive perceptual personality characteristics that are believed to be related to hypnosis-it is, in fact, not a measure of hypnotizability and the two correlate only weakly (is < .37 in two samples; Ås, 1963). Cooper and Thalbourne even note that the items in the Experience Inventory "cover 9 hypnosis-related categories" (p. 143, my italics), yet they incorrectly operationalize hypnotizability as one's score on the Experience Inventory. Although the study is identified as exploratory and the authors recommend that future investigators "consider using more conventional measures of hypnotizability such as the Harvard Scale" (p. 145), they remain incorrect in interpreting the Experience Inventory as a measure of hypnotizability. Given their misinterpretation, it remains premature to state that there is a relationship between transliminality and hypnotizability, as the authors report (p. 146).

I wish to make two other brief remarks. First, the relationship between anomalous experiences and hypnotizability is already well recognized (e.g., Nadon & Kihlstrom, 1987; Richards, 1990; see Kumar & Pekala, 2001 for a review). The authors should have mentioned this in their introductory discussion of this relationship and their examination of the association between anomalous experiences and scores on the Experience Inventory should have been identified as conceptually replicative rather than exploratory. Second, the authors curiously failed to discuss the extant literature on the relationship between childhood trauma and hypnotizability despite testing a hypothesis predicting that the two variables are positively correlated. They should have noted that this relationship has previously been examined, that empirical findings in this area have been inconsistent (e.g., J. R. Hilgard, 1972; Rhue, Lynn, Henry, & Buhk, 1990-1991), and that this relationship is not without controversy (Lynn, Meyer, & Shindler, 2004).

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