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Everyday Miracles: Results of a Representative Survey in Germany

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Abstract

This essay introduces the central results – for the first time in the English language – of a representative survey which was carried out at the Institut für Grenzgebiete der Psychologie und Psychohgiene in Freiburg in the year 2000. Over 1500 persons of the Federal Republic of Germany were questioned in a telephone interview about their attitude towards paranormal phenomena and about personal experiences in this field. The results are surprising: Germans are quite open-minded about paranormal phenomena, and more than half of the people even give an account of personal exceptional experiences. Interestingly, it is primarily young people who believe in the existence of psi phenomena and who are increasingly having personal experiences in this field. Presented are qualitative results, as well as descriptive statistics. In a second telephone interview more than 200 persons were questioned once again, this time in detail, about their personal experiences. It was found that dealing with the paranormal is not seen as problematic at all.

Introduction

Exceptional experiences are finding widespread public interest. This can be seen simply by taking a short glance into bookshops, the yellow pages or television programs; the disillusionment ("Entzauberung") of the world in the third millennium (as postulated by the

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German sociologist Max Weber at the beginning of the twentieth century) is not to be found.[1] Even though scientific and technical progress is fast-paced, postmodern people still have transcendent ("magic") experiences quite often - and few seem to see this as a problem, as we will show in this paper.

Such "exceptional" experiences were the focus of an interview study that was conducted at the *Institut für Grenzgebiete der Psychologie* in Freiburg, the central results of which are now being introduced to the English-speaking public for the first time. The survey set out to answer the following questions: How common are such exceptional experiences in Germany today? What exactly do the people involved experience? How do they assess their experiences when looking back at them? Neither the (ontological) question of "authenticity" nor the scientific explanation of the phenomena was the central issue, but rather the attempt to sociologically describe "paranormal" experiences. These, as we will show, are not considered to be exceptional but are seen as (almost) everyday experiences.

Previous Empirical Investigations

This study follows a number of empirical research projects, conducted in the last few years, which have dealt with the occurrence and phenomenology of so called *exceptional experiences*. Most of these studies were conducted in English-speaking countries as in Germany there are few up-to-date reports. It was remarkable that similar phenomena were studied in the context of quite diverse areas of research, including parapsychology, religious studies, sociology and psychology. On the one hand, this shows the connections and similarities between religious, mystical and paranormal experiences. On the other hand, this diversity is evidence of a strong heterogeneity of the research traditions involved.

The results of this study are familiar in that they show that these types of experiences are not as uncommon as the term *exceptional* would suggest. According to much of the literature, it is assumed that between 30 to 50 percent of humans have exceptional experiences (for example see Clarke, 1995; Gallup & Newport, 1991; Gaynard, 1992; Haight, 1979;

[1] With "Entzauberung der Welt" ("disillusionment of the world") Weber (1972, p.308) described the replacement of a mythological world view through processes of rationalization of the modern age. This "disillusionment" destroyed the magical and relativly homogeneous world view of the Middle Ages and lead to a rationalization of the world, which effects at the same time the "disillusionment" of the sacred sector of life – and also the sphere of religious experiencing.

Haraldsson, 1985; Haraldsson & Houtkooper 1991; McClenon, 1994a; Ross & Joshi, 1992; West, 1990) even though comparing the data is problematic due to varying methods, sample size or question wording. Nonetheless many authors conclude that such a common occurrence is independent of historical, cultural, national and sociocultural influences.

The IGPP-Study "Paranormal Experiences in the German Population"

Our survey was carried out in the year 2000 and had two phases of enquiry: a representative survey (N = 1510) was followed by qualitative interviews of those persons who had personally had exceptional experiences (N= 220). Objectives were (a) the systematic analysis of attitudes towards exceptional experiences, (b) their frequency in the German population, and (c) to determine factors which may be instrumental in bringing about such experiences (for instance, certain groups of people or specific attitudes). For this purpose, demographic criteria such as age, education, occupation, regional differences, marital status as well as religious affiliation, association with a church and religiosity were determined.

The choice of what "exceptional" experiences were considered in the questionnaire turned out to be difficult. After all, there is no agreement about what can or cannot be considered a paranormal phenomenon. The items included in the questionnaire comprise a selection of items which were empirically and pragmatically justified. In order to facilitate comparison, there was a preference for those phenomena which had commonly been included in previous studies about paranormal experiences.

The standardized questionnaire consisted of four thematic blocks: (1) questions about the conceivability of paranormal phenomena, (2) questions about the existence of personal exceptional experiences, (3) socio-demographic variables and (4) details of those persons with exceptional experiences who were willing to participate in a second interview (including, on a voluntary basis, address and/or telephone number).

The representative survey was conducted in collaboration with a professional institute for opinion polling (Academic Data, Essen) in the form of computer assisted telephone interviewing (CATI). The large sample of 10,000 telephone numbers which is the basis of our study were obtained by the following strict randomising procedure. First, a

sample was drawn out of telephone directories, then the last digits of the chosen telephone numbers were modified via an automated randomising process. Theoretically, even those terminations that are not included in telephone lists (secret numbers or the like) may thereby be reached. However, invalid number combinations are also created in this way, so selection continued until we had reached our prespecified sample size of 1500 persons. For valid numbers which were answered, 51.5% of the persons subsequently participated in the survey.[2]

Before we present the most important results of our survey in the following sections, a short note on the composition of our sample. As already mentioned, altogether 1510 interviews were carried out. The average age of the interviewees at the time of the survey was 48.5 years, with 61.5% women and 38.5% men. Despite the randomized selection procedure, this meant that women were over represented by 7% in comparison to the female population of the Federal Republic of Germany.

Selected Results

Conceivability of Paranormal Phenomena

The first section of the questionnaire concerned the attitude of the population towards paranormal phenomena. For that purpose, the interviewees were asked whether they thought that the existence of certain predetermined paranormal phenomena was possible.[3] The interviewees were asked whether they could imagine that:

"Animal-Psi" Pets are connected to their owner across large distances and are, for example, able to sense whenever he is in danger.

"Precognition" Humans are able to foresee things which are otherwise impossible for them to know or guess.

"Telepathy" Humans can perceive thoughts and feelings of other human beings across great distances.

[2]The telephone interviews of the main study (30/03 – 18/04/2000) were conducted on Mondays to Saturday from 4 p.m. to 8 p.m.

[3]The idea behind "conceivability" was to give a neutral item and to avoid the (difficult) question of believing in something (or not). On the other hand, data on "conceivability of paranormal phenomena" bear on the issue of paranormal belief and the relation between beliefs and experiences. Even though a lot of studies attend to these questions, the controversy regarding the direction of the relation continues: are paranormal experiences based on paranormal beliefs, or is it the other way round? (For this special discourse see e.g. Bainbridge & Stark 1980; Haraldsson & Houtkooper, 1991; Irwin, 1994; Otis & Alcock, 1982; Thalborne, 1995; Tobacyk & Wilkinson, 1990).

"Psychokinesis" It is possible for humans to move or bend objects with the power of their mind.

"UFO" Flying objects of extraterrestrial beings, so called UFOs, exist.

"Crisis-ESP" Humans sense when a person close to them is dying or in danger somewhere.

Figure 1 shows the distribution of the answers in order of the frequency of affirmation.

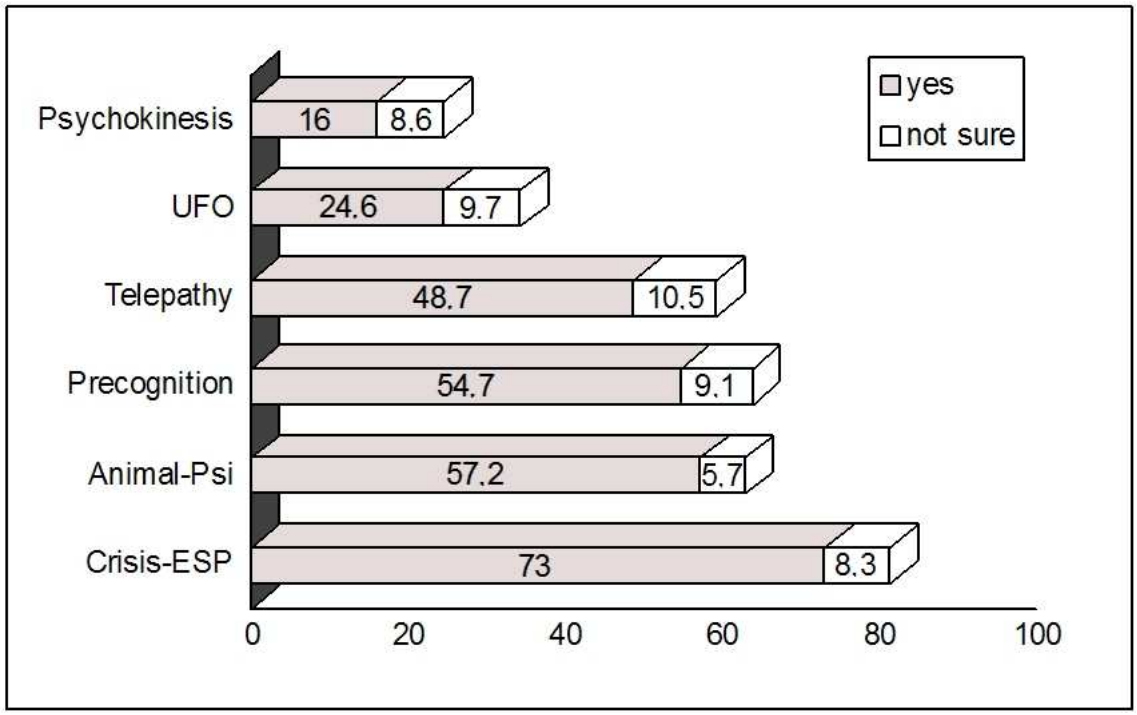

Figure 1. Percentage of "yes" and "not-sure" responses for conceivability of paranormal phenomena (N = 1510)

It seems there are considerable differences with regard to the conceivability of paranormal phenomena. To begin with, it appears that there is a high percentage of persons who can imagine that one senses when something happens to other people or when others die (crisis ESP). In general, the affirmative responses to the question of so called extra-sensory perception (including the previously mentioned death and crisis events as well as the questions about telepathy, precognition and Animal Psi), are significantly higher than the UFO and psychokinesis items, though even there positive response rates are 25% and 16% respectively.

However, that doesn't mean that everyone can imagine everything. On average, three of the six predetermined phenomena were conceivable for the persons questioned. Maximum values of five or six "Yes" responses were only found in 12% of respondents, and almost as many persons (11%) think none of the paranormal phenomena are possible.

Relationships can also be observed for socio-demographic factors, primarily age, religiosity and sex of the interviewees. For instance, significantly more phenomena are conceivable for women (mean value 2.9) than for men (mean value 2.4). Furthermore, considerable differences between the sexes can be observed for single phenomena (only exception psychokinesis). Distinctly more women than men think that the extra-sensory phenomena (precognition, telepathy, 'Animal Psi', ESP in case of death and crisis) are possible, whereas in the male interviewees only the idea of the existence of UFOs is significantly more frequent (table 1).

Table 1: Percentage 'yes' responders for conceivability of paranormal phenomena by sex

Conceivability Item	% Women (N= 926)	% Men (N= 584)	χ^2	*(p)*
Crisis-ESP	79.0	63.5	46.16	($< .001$)
Animal-Psi	63.2	47.9	49.62	($< .001$)
Precognition	60.4	45.7	47.82	($< .001$)
Telepathy	53.7	40.8	41.55	($< .001$)
UFO	19.4	32.9	35.76	($< .001$)
Psychokinesis	15.9	16.1	-	(.61)

There is also a distinct relationship between the age of the interviewees and the conceivability of paranormal phenomena. In general one can say that the open-mindedness towards such phenomena *decreases* significantly with increasing age. As table 2 shows, this result is also valid if we look at the conceivability of single phenomena.

It seems that people are more open-minded towards the paranormal when they are young as, except for the "psychokinesis" item, the younger the interviewees, the more likely they are to agree with a general conceivability of paranormal phenomena. This is most explicit in the UFO item. While one half of the 18 to 30 year olds can imagine the existence of UFOs, only 15% of the over 66 year olds can. We believe that this is due to a large extent to the fact that UFOs have become a prominent part of discussion in the mass-media in the last twenty years, where the topic of UFOs, especially in fiction, is primarily addressed to younger people. Similar significant patterns are also evident in the

Table 2: Percentage 'yes' responders for conceivability of paranormal phenomena by age

Conceivability Item	18–30 yrs (N= 256)	31–45 yrs (N= 451)	46–65 yrs (N= 501)	66 and older (N=287)[a]	η	(p)
Crisis-ESP	75.8	77.3	71.0	67.9	.095	(.007)
Animal-Psi	59.8	57.8	57.9	54.9	-	(.357)
Precognition	59.8	58.7	53.2	47.7	.092	(.015)
Telepathy	48.8	51.7	48.8	44.9	-	(.317)
UFO	43.0	28.9	17.4	14.6	.222	($< .001$)
Psychokinesis	16.8	16.8	17.8	11.1	.075	(.017)

[a]Not all interviewees specified their age so that the sum across all the age groups is less than the total N of 1510.

"crisis-ESP" and "Precognition" items. We believe that these represent different patterns and traditions in dealing with exceptional experiences that are specific to certain generations, especially as there is a near linear trend of decreasing conceivability with increasing age. Whether this is due to the process of aging and maturing or whether the results should be viewed as cohort effects unfortunately cannot be answered with the present cross-sectional design.

Relationships with the conceivability of paranormal phenomena can also be found in the variables concerning religion. On average, there appears to be more affirmative responses if the interviewee is member of a church, though the specific denomination makes no difference. However, considering the general tendency towards secularization in modern societies, formal membership of a church may not be a very convincing criterion.[4] Instead, a more informative relationship with religion may be found by considering the self-assessed religiosity of the interviewees.[5] Here, statistically significant relationships appear: the conceivability of all phenomena is higher when the interviewees consider themselves "somewhat" or "very" religious. Those who consider themselves "not religious at all" on average believe that 2.2 phenomena can exist. This value rises with increasing religiosity, with "barely

[4]Moreover, the specific situation of the German reunification must be taken into consideration as the situation in the two parts of the country is still extremely different, even more than ten years after the reunification. While in West Germany most people (81% of the interviewees in our sample) are a member of one of the two large German churches, this is true only for 30% of the interviewees in East Germany (the former GDR).

[5]The question was: "Besides the fact of whether you are a member of a church or not: How religious would you rate yourself on a scale of 1 to 4? 1 being *not religious at all*, 2 *barely religious*, 3 *somewhat religious*, 4 *very religious*."

religious" believing in the existence of 2.7 phenomena, "somewhat religious" accept 2.88 phenoemna, and "very religious" accept 2.94 phenomena. An ANOVA showed this to be a statistically significant trend (eta = .152, $p < .001$).

Only the UFO item shows a trend in the opposite direction: about 20% of the interviewees classified as "somewhat" or "very religious" thought that it is possible that flying objects of extraterrestrial beings exist but this increased to 30% in the groups "barely" and "not at all religious". This shows once again the peculiarity of the UFO item, suggesting that this should be interpreted by considering the background of current media fiction and the changing scientific picture of man's in the universe rather than in the context of classic paranormal ('psychic') phenomena (cf. Schetsche, 1997).

To sum up we can say that, while only the *conceivability* was studied and therefore not much can be said about individual convictions or specific belief in the existence of these phenomena, it can be confirmed that in principle the interviewees are quite open-minded towards paranormal phenomena. At the same time, occasional distinct differences between single groups of persons must be acknowledged. These are due to the influence of cultural factors in the formation or adoption of personal attitudes. For example, the distinct differences between the age groups make it possible to draw conclusions about traditions in dealing with such phenomena that are typical for each generation. The assessment of single psi phenomena can vary as well and may depend on whether explanations exist that are compatible with the prevalent scientific world view or with existing possibilities of interpretation.

Incidence of Paranormal Experiences in Germany

Besides the questions about conceivability the questionnaire also contained a second thematic section, which asked about the existence of *personal* exceptional experience. The selection of the items was based on the very wide spectrum of varying forms of exceptional experience. However, once more a concrete selection had to be made to allow comparison both with already existing empirical studies and the first "conceivability" section. The participants in part two of the study were asked whether:

"ESP-Dream" They had ever seen something in a dream that later actually happened, something of which they could have had no prior

knowledge and which they could not have guessed.

'Strange Coincidences" They had ever had certain things happen suddenly in such an amazing way that it was impossible for them to believe in pure chance any longer.

"Crisis-ESP" They had ever experienced strange things happening at exactly the same time someone died or had an accident elsewhere.

"Animal Psi" They had ever seen an animal behave in such an unusual manner that they thought it must be caused by something supernatural.

"Apparition" They had ever perceived something they took for a ghost of someone who had died or for some other unusual being.

"Déjà Vu" They had ever suddenly had the strange feeling that they had been in the same situation or in the same place before even though they never knowingly had.

"Haunting" Things surrounding them had ever behaved in such a peculiar manner that they had the feeling the place was haunted.

"UFO" They had ever seen anything they believed to be an UFO.[6]

"Other/Miscellaneous" They had ever had extraordinary experiences other than the above.

To begin with, the conclusion: certainly the most important result of our study was that altogether 73%, that is almost three quarters of the interviewees, had personally experienced at least one of the given phenomena.[7] In other words: "exceptional" experiences are astoundingly common in the German population.

On average, the 1100 interviewees with exceptional experiences have experienced between two to three of the given phenomena (mean value 2.8). About one quarter of the interviewees (25.7%) have personally experienced four or more of the given experiences. Of course we are aware of the fact that this high frequency of extraordinary experiences also includes experiences such as déjà vu and "amazing coincidences"

[6]Only those persons that had stated in the preceding part that they could imagine that UFOs as extraterrestrial flying objects really exist were asked this question. This leads to some methodological problems that make it necessary to exclude this item in this section.

[7]Whether a phenomenon was experienced once or more than once could only be clarified in the second (qualitative) survey. Here, merely the occurrence of certain types of experience was relevant.

which can be characterized as relatively ordinary. However, the percentage of those who only agree with the déjà vu-item is a mere 8% of all respondents. Only 4% have only experienced "amazing coincidences" and the number of those who have experienced only these two 'ordinary' experiences is 4.5% (together representing a total of 68 people). Even if we take into consideration only the classical paranormal experiences "ESP dream", "apparition", "crisis-ESP" and "haunting", still 52% of the interviewees have *personally* experienced at least one of these extraordinary phenomena.

Table 3: Incidence of paranormal experiences (N = 1510)

Incidence (personal experience) of:	N	%
Déjà Vu	747	49.5
ESP-dream	554	36.7
Strange Coincidences	551	36.5
Crisis-ESP	283	18.7
Apparition	238	15.8
Animal-Psi	231	15.3
Haunting	183	12.1
Other/miscellaneous	115	7.6

However, these numbers must be interpreted with caution , if only because what they show is no more than mere agreement to a standardized given item. Which individual experience lies behind each of the answers, in which context these experiences occur, which personal relevance and what kind of exceptional character the interviewees see in these phenomena – all this cannot be determined without concrete accounts of these experiences. Furthermore relativisations must be accepted. For instance, only after the second interview did an overlap between the ESP-dream and the déjà vu item become apparent: many persons had (also) affirmed the ESP-dream question when in fact they meant a déjà vu. It showed that many interviewees employed the (special) state of experience in a dream as a possible *hypothesis* to explain the otherwise unexplainable recognition of situations (déjà vu).

Socio-Demographic Variables

But let us go on to further results of the survey. It can be said that differences between men and women, between East and West Germans, as well as criteria such as denomination, affiliation with a church and religiosity have *no significant influence on the occurrence* of an excep-

tional experience. If we however consider the average number of experiences, significant differences can definitely be found. For instance, women have experienced significantly more phenomena (an average of 2.8) than men (an average of 2.6).

Once again, statistically significant differences can be found especially in regard to the age of the interviewees: with increasing age of the interviewees, the percentage of persons with exceptional experiences decreases significantly. While 89.5% of the younger interviewees under 30 years of age have had exceptional experiences, which is almost 17 percentage points more than in the complete sample (72.8%), the percentage decreases successively to 77.9% in the 31 to 45 year olds, to 66.8% in the 46 to 65 year olds, and to a mere 61% in those interviewees who are more than 65 years old. The relationship between occurrence of exceptional experiences and age groups is statistically significant (χ^2 = 71.415, $p < .001$).

So, not only is a more open-minded attitude towards paranormal phenomena therefore a characteristic of the younger generation (as was already apparent in the increased conceivability of the younger interviewees compared to the older ones), but younger persons also have more personal exceptional experiences. The reason for this cannot be derived from the statistical data; as sociologists, we assume that the biographical context of such experiences plays an important role. At a relatively early stage in life, people are possibly more preoccupied with such phenomena, which can be quite different from serious and binding convictions and belief systems. Often, simple curiosity or a behavior specific to a certain group or environment are the basis for so-called occult interests. Furthermore, the relevance of extraordinary experiences can decrease with increasing age and experience. Exceptional experiences are then only one field of experience among many others, and accordingly they are repressed or considered hardly worth remembering. Maybe the growing experience in life simply brings other, more ordinary possibilities for explaining these phenomena.

However, if one takes into consideration *single types* of experience, restrictions must be made. Distinct connections are evident in déjà vu-experiences, in ESP-dreams and in strange coincidences, which are experienced significantly more often by younger people (table 4).

This is reversed in the items “apparitions” and “crisis-ESP”. That is however at the most a trend, as the results are not statistically signifi-

Table 4: Percentage 'yes' responders for type of paranormal experiences by age (N = 1496)

Experiences	18–30 yrs (N= 256)	31–45 yrs (N= 453)	46–65 yrs (N= 500)	66 and older (N=287)[a]	η	(p)
Déjà Vu	76.2	64.0	36.2	26.1	.366	(<.001)
ESP-dream	57.0	42.6	30.4	21.6	.244	(< .001)
Strange coincidences	42.2	42.0	33.1	30.1	.120	(< .001)
Crisis-ESP	14.5	18.3	20.4	21.3	-	(.111)
Apparition	13.7	15.0	16.2	18.8	.091	(.036)
Animal-Psi	16.1	15.3	15.9	14.3	-	(.071)
Haunting	16.8	10.8	11.6	11.5	-	(.177)

[a] 14 people did not indicate their age, so that the sum across all the age groups is slightly less than the total N of 1510.

Table 5: Percentage 'yes' responders for paranormal experiences by sex (N = 1510)

Experiences	Women (N = 926)	Men (N= 584)
Déjà Vu	48.8	50.5
ESP-dream	38.2	34.2
Strange coincidences	37.3	35.3
Crisis-ESP	23.0	12.0
Apparition	18.6	11.3
Animal-Psi	14.9	16.1
Haunting	12.9	11.0

cant.

Differences can also be found by comparing men and women (Table 5). It appears that women experience "apparitions" (χ^2 = 28.541, p $<$ .001) and "crisis-ESP" (χ^2 = 28.541, p $<$ .001) significantly more frequently. The difference with men amounts to up to 11 percentage points. This can also be found in the items "amazing coincidences", "haunting" and "ESP dreams" as a statistically non-significant trend. Only in the Déjà vus and animal experiences is the percentage of men having experiences higher.

With regard to the question of whether the occurrence of certain exceptional experiences is dependent on religious variables, no factors in regard to affiliation with a church, attachment to one's church or denomination can be found. It has already been mentioned that in addition these factors don't seem very convincing when taking into consideration the tendencies towards secularization in societies. The issue changes however, if we take another look at the individual religios-

ity beyond traditional affiliation with a church. Table 6 shows distinct connections between certain types of experience and the religious self-assessment of the interviewees.

Table 6: Percentage 'yes' responders for paranormal experiences by religiosity (N = 1477)

Experiences	'Not at all' (N= 218)	'Barely' (N= 307)	'Somewhat' (N= 725)	'Very' (N= 227)[a]	η	*(p)*
Déjà Vu	60.6	51.5	47.0	46.3	.090	(.022)
ESP-dream	37.6	38.8	34.9	38.8	-	(.812)
Strange coincidences	26.3	34.3	37.2	48.2	.127	($< .001$)
Crisis-ESP	12.8	14.7	19.4	27.3	.119	(.001)
Apparition	11.0	11.4	17.4	20.8	.098	(.014)
Animal-Psi	9.7	19.5	14.9	16.4	.040	(.012)
Haunting	9.2	9.8	12.4	15.9	-	(.24)

[a] The sum of the interviewees is reduced to N= 1477 here, because 17 people answered 'I don't know' and 16 people answered 'not specified'.

We can see that certain experiences such as amazing coincidences, apparitions or extra-sensory perception are reported significantly more often by those persons who assessed themselves as (somewhat or very) religious in the questionnaire. The second interview showed that these experiences in particular are often put in the context of religious interpretations by the interviewees.

Other aspects of the data also indicate that exceptional experiences are linked with spiritual, religious or ideological attitudes in a complex manner. As expected, a connection between the conceivability and the occurrence of extraordinary experiences can be observed. Those interviewees who can imagine that paranormal phenomena really exist, thereby displaying a corresponding positive attitude, have also personally experienced extraordinary experiences significantly more often: 98% of those who can imagine all phenomena report personal experiences. In those who can imagine only one phenomenon, these are a "mere" 54%. Furthermore, those who can actually imagine many of the given phenomena usually also have several (different kinds of) experiences on average (Pearson r = 0.487, $p < .001$). However, no conclusion is possible here about the direction in which this connection goes. Three connections are conceivable in principle: (1) someone who is more open-minded towards these phenomena is more likely to have corresponding personal experiences (in other words, is more disposed

to interpret occurrences in terms of paranormal experiences); (2) Someone who has had a number of exceptional experiences during his lifetime is more disposed to believe in the existence of such phenomena; (3) Experiences with the psychic and corresponding positive attitudes are both dependent on a third factor or influence one another in such a manner that one cannot speak of a causal connection in one direction.

Is an exceptional experience always a paranormal phenomenon?

This ambivalence in the interpretation of the data is due to the relatively limited character of this standardized survey. So far, our statistical results allow neither for conclusions about the contents of the experiences, their interpretations and consequences, nor for information about the individual (biographical) context of the experiences or about cultural factors of influence. Questions about how such exceptional experiences are assessed and interpreted by the people involved also remained unanswered. For example, is an exceptional experience always also a paranormal phenomenon?

In order to follow and reconstruct such processes of interpretation, we decided to conduct a second part of the study. In this part, qualitative interviews were carried out, so that altogether a research design was available to us that wasn't restricted by statistical distributions, but rather allowed those people with such experiences to have their say.[8]

A positive effect of the first survey was that almost half of the interviewees with exceptional experiences agreed to participate in a second interview (altogether 525 contact addresses). Because of this we had to make a selection. We used the procedure of "theoretical sampling" (cf. Glaser & Strauss, 1967), in which the selection of a single case takes place after consideration of its content and of the results from the collected material. In particular the interviewees profile of conceivability and experience as well as socio-demographic criteria served as factors. Altogether, 220 telephone interviews were conducted in this phase of the study.[9]

For the evaluation, a main point was the reconstruction of typical characteristics for each of the extraordinary phenomena. In addition,

[8]Several previous studies have undertaken this step (combining a standardized survey and open interviews) e.g., Greeley, 1975; Knoblauch et al, 2001; McClenon, 1994b; West, 1990. For the qualitative methodology in examining psi experiences see: Stowell, 1995; Virtanen, 1990; White, 1990; Woffitt, 1992.

[9]The thematic interviews were conducted by R. Deflorin, H. Falkenhagen and I. Schmied-Knittel.

emphasis was placed on the analysis of the narrations and on an assumed heterogeneity and individuality of the reports. Furthermore, more complex questions were pursued, for instance about the sociolinguistic mediation of extraordinary experiences as well as about the subjective interpretation and assessment of the phenomena. Although the reports do show a great heterogeneity and individuality of experience, we were nevertheless able to detect structural similarities. Unfortunately it is not possible for us to give detailed proof of this here due to the necessary briefness of this article. All we can do in the next paragraphs is to introduce some of the central assumptions which developed out of the qualitative data.[10] The following hypotheses are based on an extensive qualitative analysis (not to be mixed up with a quantitative content analysis!):

Exceptional experiences are generally widespread but biographically rare.

The representative survey came to the conclusion that in general exceptional experiences are common. However, in the qualitative interviews it became evident that that doesn't mean that the individual person is regularly affected. On the contrary, from an individual or biographical point of view the phenomena occur rather rarely, so at least in this sense they are *exceptional* experiences.

Similar experiences are interpreted quite differently.

We found clear similarities or returning elements and characteristics in certain types of experience. Reports about apparitions or about déjà vu experiences turned out to be quite similar, whereas this was not true for subjective attempts to explain the experienced phenomena, which were surprisingly diverse. For experiences that are comparable on the level of content and structure, religious and parapsychological as well as scientific and popular (lay) psychological interpretations compete with each other. Here it is remarkable that one's choice of a model is not as dependent on the type of exceptional experience as on one's particular worldview.

[10] We only can present excerpts from the complete results due to the limited space. For German speaking readers we refer to the extensive publication "Alltägliche Wunder" (Bauer & Schetsche, 2003) which contains the compete results of the research project.

Everyday explanations are more frequent than transcendental ones.

We observed that the application of 'paranormal' models of explanation or references to the 'psi' qualities of the experiences are distinctly more rare than one would expect considering the traditional (and also parapsychological) understanding of such phenomena. Only very occasionally do the interviewees resort to the effects of supernatural powers or to the existence of psychic abilities in their reports. Far more frequently, the interviewees are guided by an everyday and pragmatic perspective. In all of the interviews, this can be seen by the following indicators: (1) the predominance of rational explanations for the experienced phenomena, (2) the seamless integration of the exceptional experience into the individual biography and (3) the fact that aspects relevant to counseling or even clinical practice are almost never an issue.

We don't mean to suggest that the persons concerned don't hold on at all to any specific quality of experience. On the contrary, the quality of the respective experience is brought out as remarkable and peculiar compared to conventional experience, even though it is not declared as transcendental or supernatural. Most of the interviewees rather classify their experiences – often told in form of an anecdote – as a kind of 'abnormal-normal' incident, which is why we coined the term *every-day miracle*.

Communication takes place in a 'shielded mode'.

Even though there is not one specific characteristic of 'exceptional' experience, we can nevertheless determine a characteristic when regarding the communication of these experiences. A structural similarity exists which allows us to continue speaking about exceptional experiences (without any quotation marks) despite all our reservations. This characteristic is that communication about this type of experience almost always takes place in a specific, secure mode of speech. We have named this recurrent style of narration "shielded communication". This mode signals (to oneself and to others) that one has dared enter into an area of 'special knowledge'. To be precise, the narrator, using a number of communicative precautions, sees to it that it is possible to actually believe him or her. S/he employs specific strategies such as naming witnesses and experts, emphasizing her/his (otherwise) rational attitude, or argumentatively eliminating other logical possibilities of explanation. The latter signal to the conversational partner that one only resorted to the

paranormal explanation in the end because all other considered 'natural' explanations *had to be* ruled out.[11]

Conclusions

Whatever the explanation turns out to be, the persons concerned still feel that their experiences are rather unspectacular. Even though they are seen as definitely remarkable and memorable, they seldom require special interpretations or even actions. In other words, most of the experiences that are seen as "exceptional" by science appear to be an integral part of the (familiar) everyday world, though perhaps more accurately a 'special world'. In this world, such experiences seem to find their place without any problems, although narrative precautions are employed when discussing them. The specific scientific preoccupation with the respective phenomena is in no small part responsible for this. As is known, parapsychology constitutes an exception among research disciplines, as it doesn't per se deny exceptional phenomena an objective reality as accepted disciplines do. This is positive if one takes into consideration how many people report such experiences – in our study alone this is between 50 and 70 percent of the population! Many other studies come to similar results and even find an increase of exceptional experiences over the years (cf. Greeley, 1975, 1978, 1991; Newport & Strausberg, 2001; McClenon, 1994a, 1994b; Yamane & Polzer, 1994). Some authors such as Greeley (1975) think that the high occurrence of such experiences is evidence of the fact that the so-called exceptional is rather something common. This process of normalization is seen as something that makes it increasingly easy for the people concerned to talk about their experiences, including in interviews.

Of course, the question of whether it is the number of experiences that is increasing or the willingness to talk about them cannot be resolved completely. However, if one takes a final look at our complete research results, it becomes evident that the personal convictions about the existence and effects of paranormal phenomena are still an integral part of the belief systems of our modern societies, albeit not one that guides actions. We were able to show that the population is not only quite open-minded towards paranormal or anomalistic phenomena but that personal experiences in this area are also common. The important

[11] Remember this is only a short presentation of the results without references to other studies. There are various authors who did work in this field, and most of their thesis fit with our results. For example Wooffitt's work (1992) applied discourse analysis to people's narratives of paranormal experiences.

factor is that completely normal people have these experiences.

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The Effects of Intuition and Attitudes Towards Gambling on ESP Performance During a Gambling Task

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Abstract

In the present study, evidence was sought for the presence of compliant and noncompliant pro attitudes in a forced-choice card-identifying experiment. The pro attitude is an orientation of the self towards a specific and preferred paranormal outcome or goal (Thalbourne, in press). The experiment was designed to encourage participants to adopt a pro attitude towards only one of two card outcomes (spade-hitting or club-hitting). This protocol would yield evidence in the form of psi effects that indicated ***by inference*** *that participants either acted with compliance (they followed the experimenter's instructions) or noncompliance (they did not follow the experimenter's instructions). The modifying effects of three attitudes/dispositions on paranormal performance were also investigated – (i) attitudes towards gambling, (ii) belief in good luck, and (iii) intuition. High scores on the above-mentioned attitudes/dispositions were hypothesised as being conducive to, and necessary for psi. There was (i) a significant negative relationship between the compliant psi outcome (i.e., spade-hitting) and the noncompliant psi outcome (i.e., club-hitting), and (ii) a negative relationship between club-hitting and attitude toward horse racing. There was post hoc evidence of significant relationships between psi and Intuiting (introverted and extraverted) for moderate scorers on the Gambling Attitude Scales (using aggregate scores), and evidence of a replicated forced-choice psi effect.*

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Introduction

The pro attitude concept is a key element in Thalbourne's theory of psychopraxia (*psyche* = 'soul' or 'mind' or 'self' + *praxia* = 'do' or 'accomplish'). The theory emphasises four fundamental aspects of action, whether it occurs endosomatically (within the body) or exosomatically (outside the body).

1. "The self, not defined further than that it is inclusive of the "I" – the common denominator of all experience and the co-agent of all action (this description allows for additional agency of the unconscious component of the self).

2. "The 'pro attitude': A person may be said to have a pro attitude towards state **S** when they would prefer **S** rather than **–S** [not **S**] if those two alternatives were to be brought to their attention. Under this heading fall goals, desires, wishes, intentions, needs, preferences, and dispositions, be they conscious or unconscious. Psi-missing is also postulated to be the result of a pro attitude, perhaps unconscious, toward obtaining low scores. It is postulated that there is a hierarchy of pro attitudes, and the most potent one wins out. The self is said to "adopt" a pro attitude.

3. "The goal-state **S** that is to be brought about, whether in the so-called "mental" sphere or in the "physical" sphere is irrelevant.

4. "The set of intervening necessary conditions mediating between the self and its pro attitude and the goal-state **S**." (Storm & Thalbourne, 2000, p. 280)

Thalbourne (2004) hypothesised that the self, holding a so-called 'pro attitude', plays an initiating role in bringing about psi effects. A pro attitude is not the same as a positive attitude because the latter is held in consciousness and is based on a conscious decision, whereas the former can be unconscious and may, for example, work as a deeply entrenched core belief of which the participant is barely aware, or not always aware.

In the present study, it is theorised that there are two specific forms of pro attitude (viz., *compliant* and *noncompliant* pro attitudes), and evidence is sought to indicate that these pro attitudes exist. It is pro-

posed that compliance and noncompliance can actually be used to inform us about the nature of the pro attitude. More importantly, if researchers can gain an understanding of the dynamics of the compliance/noncompliance relationship, they may gain some control over psi in the laboratory.

The present study is also an investigation into the related effects that individual differences may have on the outcomes of paranormal tasks. Three attitudes/dispositions[1] are therefore investigated: (i) attitude towards various types of gambling, (ii) belief in good luck, and (iii) the personality variable, Intuiting. It is hypothesised that pro attitudes are modified by these attitudes/dispositions, and may even be necessary in bringing about paranormal effects. Consequently, attitudes/dispositions, pro attitudes, and compliance/noncompliance may all be related. Before reviewing the literature on these above-mentioned attitudes/dispositions, the nature of compliance in the experimental situation needs consideration.

The Pro Attitude and the Problems of Compliance and Noncompliance

In the experimental situation, if the participant adopts a pro attitude, then it is usually understood that they have a goal state or target in mind at the time of instruction by the experimenter. Usually, a participant willingly follows the requirements of an experimenter's instructions, which is in accord with the requirements of the experimental task. We call this participant's state of mind 'compliance'. In conventional psi testing, a significant result is indicative of a psi effect and we adopt this convention. Furthermore, whenever psi hitting is elicited, we argue that a compliant pro attitude can be inferred from that effect. That is, we make the assumption that a sufficient number of participants have *complied* with the experimenter's instructions at some level – conscious or unconscious – and that sufficient numbers of participants must therefore have adopted the appropriate pro attitude.[2]

[1]There is some conceptual overlap in the meanings of the nouns 'attitude' and 'disposition'. Attitude is taken to mean a particular 'position' or 'standpoint' (hence, *attitude* towards gambling), while 'disposition' refers to 'tendency' or 'inclination' (hence, a *disposition* to believe in good luck). Both can be long-standing characteristics of the individual (i.e., they may be *pre*-dispositional), and many a state or trait could be described unequivocally as both an attitude and a disposition.

[2]Note that this argument does not concede that a participant who is *consciously* compliant (and therefore has a compliant pro attitude) could, on occasion, produce psi-missing *as a result of that same pro attitude*. If such a relationship was 'evident', we would posit that the cause be ascribed to a stronger unconscious pro attitude of the participant, and/or other persons (in the form of, say, an experimenter effect).

However, many parapsychologists expect some participants to hold a hidden agenda, and they will not follow the instructions of the experimenter. They do not act in accordance with the requirements of the experimental task. We call this participant's state of mind 'noncompliance'. When participants (or groups of participants) act this way, we say they have adopted a *noncompliant* pro attitude. Usually, these types of participants are skeptics, but they do not necessarily attempt psi-missing. They may, however, hold 'strategies' aimed at producing anything other than psi-hitting. Experimenters in the past have attempted to identify these strategies—many of them theorised as producing various types of psi—and we suggest that these forms of psi are products of noncompliant pro attitudes.[3]

Some forms of the noncompliant pro attitude can be investigated. For example, Thalbourne (2005) has indicated the possibility that pro attitudes may be mutually opposed to one another. This 'oppositionalism' can be derived from his statement in which he subsumes under the umbrella-term 'pro attitude', not only "motives, desires and goals on a full-blown conscious level, but also their less conscious counterparts" (Thalbourne, 2004, p. 65). Experimenters must be alert to the possibility of noncompliant pro attitudes that come about as a result of ulterior motives or unconscious agendas.

The experiment described in the present study was partly designed to identify psi outcomes that may have been the product of compliant pro attitudes. We follow the convention that statistical evidence for a 'planned' psi-hitting effect can be found. From that effect, we would infer the presence of a sufficient number of compliant pro attitudes. Evidence for this type of pro attitude supports the pro attitude concept, but failure to detect the effect could lead to a premature dismissal of the pro attitude concept as a workable theoretical premise in parapsychology insofar as there is *no* statistical evidence of noncompliance. In many parapsychological experiments, it *cannot* be inferred that an insufficient number of noncompliant pro attitudes were present. The only way we could make that inference is to stipulate in advance that a specific counter-task (e.g., targeting a decoy) is to be *avoided* by participants. If participants target the decoy, they are said to hold noncompliant pro

[3]The form of the noncompliant pro attitude is indeterminate if the effect is also indeterminate – that is, if there is no evidence of *displacement effects* (both in kind and/or 'steps' or 'removes'), *position effects*, or *serial-position effects*, etc. (see Thalbourne, 2003, pp. 31, 89, 113, respectively, for definitions of these effects).

attitudes. We therefore make the assumption that compliant and noncompliant pro attitudes are *incompatible* (i.e., mutually opposed). Compliance and noncompliance are thus qualitative states of mind that characterise the nature of the pro attitude.

The experiment described in the present article was designed to test the hypothesised relationship between compliant and noncompliant pro attitudes. The experiment was also designed to test the 'gambling' nature of individuals (i.e., as a believer in good luck, and/or as an intuitive type), since it is theorised that belief in good luck and intuition may facilitate psi effects.

In the next section, the gambling literature is reviewed, since paranormal effects may be involved in the gambling process.

Gambling

Recent research on gambling has shown that it is significantly related to individual differences in risk taking, liberalism, and previous gambling experience (Kassinove, 1998; Peltzer & Thole, 2000). Scales that measure attitudes towards gambling have been used to indicate a readiness to participate in gambling tasks and to take risks, and even to identify pathological gamblers (Kassinove, 1998; Lesieur & Blume, 1987). Therefore, some research into gambling using gambling scales has been carried out, and the sociological and psychological issues associated with gambling are well recognised, but no use whatsoever has been made of gambling scales as predictors of paranormal ability (e.g., Radin & Rebman; 1998; Etzold, 2001).

Only three studies were found that featured psi tasks using gambling techniques (Brier & Tyminski; 1970; Don, McDonough, & Warren, 1998; Kugel, 1990-1991). None of these studies used gambling scales. Insofar as a limited number of researchers have used participants in gambling situations to test paranormal ability, it remains to be seen whether 'gamblers' *per se* (i.e., gamblers characterised as such on the basis of scores on gambling scales) are predisposed towards gambling success (or failure), since, as stated, no study yet has sought a relationship between attitude towards gambling and paranormal ability.

There are those gamblers who are professional (they are generally successful and may, for example, be strongly influenced by intuition when they gamble), and there are those who lose habitually – the so-called 'problem gamblers'. Others have merely a social interest in gambling as a form of harmless entertainment. However, anyone may be

nominally referred to as a gambler if they participate in a gambling task. Individuals who are supportive of gambling (specifically referring to successful gamblers here) may be so oriented because they have certain dispositions, which encourage a pro attitude towards gambling success when they participate in gambling tasks (for an example, see Rhine, 1967, pp. 166-168). In fact, based on Thalbourne's (2004, pp. 65-66) statements, it could be argued that a pro attitude towards the goal of success at gambling may contribute to gambling success. This pro attitude may be tempered by the attitude or personality trait of the participant towards gambling. That is, gambling success may be *at least* partially attributable to the paranormal influence of the gambler in interaction with the personality of the gambler.

The next section looks at belief in good luck, which may be concomitant with a positive attitude towards gambling.

Belief in Good Luck

Smith, Harris and Joiner (1996) found that the term 'luck' was associated with events in one's life that worked out well, but were essentially attributable to chance. They also found that people tended to hold one and only one belief about the nature of luck: (i) luck was "an attribute that was either present or absent at birth," or (ii) the "level of luck" could be controlled by "superstitious behavior," or (iii) "luck was given to them (and taken away from them) by a 'powerful other' " (p. 37).

The so-called 'unlucky' person tended to believe (i) or (iii) above, and thought that their bad luck was outside their control, whereas the 'lucky' person tended to believe (ii) above, and thought that they were the 'cause' of their good luck.

Smith, Harris and Joiner (1996) noted that the cause of luck could come from (a) *cognitive biases* (i.e., selective memory, where optimists tend to remember the good, i.e., 'lucky' events, and pessimists tend to remember the bad, i.e., 'unlucky' events), (b) *motivational biases* (illusions of control could be set in place such as soft throws of dice to get low numbers, or personally selecting one's own lottery ticket), (c) *implicit learning* (with practice, strategies are learned unconsciously, and these, and not luck, account for improved performance), and (d) *psi* ("individuals might be using psi to create favorable situations" (p. 38)). The focus of the present study is on (d), where it is hypothesised that outcomes attributed to 'luck' are actually caused by paranormal means.

Greene (1960) was one of the first to investigate the concept of luck in paranormal research. She used the Greene Luck Questionnaire, which measures perceived luckiness, to determine a relationship between participants' perceptions about their own luck and success at a PK task involving the throwing of a ten-sided die. No relationship between luckiness and PK success was found. Ratte and Greene's (1960) variation on Greene's (1960) task used throws of a die to determine outcomes in an imaginary basketball game, and this time, scores on the luckiness scale correlated significantly with PK scores.

Generally, studies on luck are few and far between. Only in the 1990s has there been a renewed interest. Wiseman, Harris and Middleton (1994) administered a 2-trial 4-choice free-response clairvoyance test to participants who rated themselves on luckiness, but the correlation between perceived luckiness and actual ESP performance was not significant. They did find a significant positive correlation between perceived luckiness and actual paranormal performance for those participants who believed the paranormal task to be dependent on non-chance factors. Non-chance factors may include the perception that luck was involved.

Smith, Wiseman, Machin, Harris, and Joiner (1997) rated participants as 'lucky', 'unlucky', or 'uncertain' according to their responses on a Luckiness Questionnaire. Participants were asked to rate in advance their performance on a pseudo-RNG-based coin-flipping task, and then to perform the task. There were only chance differences between 'lucky' and 'unlucky' participants on psi scores, and ratings of predicted psi performance. However, a significant positive correlation was found between predicted psi performance and actual psi performance.

Darke and Freedman (1997a, 1997b) were also among the first to revive the interest in the phenomenon of luck. In terms of belief (and disbelief) in good luck, Darke and Freedman (1997a) define belief in good luck as "the [irrational] view that luck is a somewhat stable characteristic that consistently favors some people but not others and is especially likely to favor oneself," whereas disbelief in luck is defined as "the tendency to agree with the rational view of luck as random and unreliable" (p. 490). Darke and Freedman (1997b) found that scores on the Belief in Good Luck (BIGL) scale predicted positive expectations for the outcome of everyday situations that are typically associated with luck. They also found that those who believed themselves to be lucky were more confident and bet more money on a betting task, while those who believed

themselves to be unlucky, were less confident and bet less money.

Watt and Nagtegaal (2000) administered the BIGL scale to participants who then purchased tickets in the UK National Lottery. They found that 'lucky' participants (based on total BIGL scores) did not do significantly better than 'unlucky' participants at the lottery task. However, those who specifically believed their luck could affect their lottery success (based on answers to Question 8 on the Lottery Questionnaire scale about luck and its effect on lottery success; see Watt & Nagtegaal, 2000, p. 51) had significantly greater lottery success than those who did not believe their luck could affect their lottery success. In a dice-throwing task, again using the BIGL scale, there was no significant relationship between BIGL scores and success at the task.

While the results of the above studies are encouraging, more research on belief in luck is needed. In the present study, the focus is on belief in good luck. The tacit understanding will be maintained that belief in good luck has the irrational dimensions already described (viz., Darke & Freedman's, 1997a, definitions given above). The parapsychological experiment in the present study necessarily and legitimately eliminates the first three biases (a), (b), and (c), given above as the cause of luck (Smith, Harris & Joiner, 1996).

Intuition

In Jung's (1987) theory of Psychological Types it was proposed that intuition (the dominant personality function in consciousness of the so-called 'intuitive type') serves the purpose of determining the potential (i.e., the efficacy, the possibility, or the future state) of the object under observation, or the outcome of an event. Intuition is one of four functions of Jung's typology, along with Thinking, Feeling, and Sensation. Jung (1971) defines Intuition as:

> "...the function that mediates perceptions in an *unconscious way*...In intuition a content presents itself whole and complete, without our being able to explain or discover how this content came into existence. Intuition is a kind of instinctive apprehension. . . . Intuitive knowledge possesses an intrinsic certainty and conviction, [which] rests equally on a definite state of psychic "alertness" of whose origin the subject is unconscious."
>
> (Jung, 1971, para. 770).

Jung (1977) saw intuition, especially extraverted intuition, as being the function that assisted gamblers the most in their decision-making. Introverts are too concerned with inner (personal) processes to make judgments about external events. Jung may also have been responding to earlier research in parapsychology that found introverts tended not to score as high on psi tasks as extroverts.

Thalbourne (2004) too has hypothesised that intuition may be a condition conducive to exosomatic psychopraxia (i.e., psi). He refers to a special form of "infallible intuition" that keeps one in "a condition or state of consciousness" where "no information is inaccessible" (p. 117).

Daniels (1996) defined intuition as "the non-paranormal ability to grasp the elements of a situation or to draw conclusions about complex events in ways that go beyond a purely rational or intellectual analysis." However, we do not know yet whether successful (i.e., efficacious) intuition is an exclusively normal function, and it would be presumptuous to regard it as such. In fact, it is possible that valid intuitions can be the result of paranormal processes. Many decades ago, Hart (1948) noted the possibility of "practical applications of intuition for more rapid and successful development of research in the field of parapsychology" (p. 12). Since then, some efforts have been made towards incorporating the idea of intuition into parapsychological theory and experimental design (for examples, see Edge, 1977; Steinkamp, 1998; Targ, 1993; Tobacyk & Nagot, 1994; Weiner, 1982).

Intuitive types may have an advantage in paranormal tasks and they may more often be gamblers than the other three Jungian types. The professional gambler may even be more successful at gambling tasks than nonprofessionals due largely to a reliance on intuition. The function of intuition as a Jungian concept has been poorly researched in regard to the paranormal. Only two studies (Alexander, 2000; Parker, Grams & Pettersson, 1998) were found that looked at Intuition as measured on the MBTI, a test based on the 'bi-polar' assumption that Jung made in his theory about types. Neither study produced results indicating the use of intuition in the psi process.

Loomis and Singer (1980) found evidence that undermines Jung's 'bi-polar' assumption. The Singer-Loomis Type Deployment Inventory (SL-TDI) allows for ostensibly more realistic responses to the functions by not forcing participants to treat them as polarised constructs (i.e., as dimensional pairs: viz., thinking-feeling and sensing-intuiting). Instead, the four functions are measured on eight separate scales (i.e., the

extraversion and introversion dimensions are measured on each function). These scales are used in the present study.

There is little support for the hypothesis that intuition may be a conducive condition for a paranormal effect. Nevertheless, it has become a surrogate term for paranormal process, and has gained sufficient appeal for some researchers, leading them to establish research organizations devoted almost exclusively to research into intuition as a faculty of the human personality.[4] Research by these organizations may lead to further knowledge about intuition and its ostensible twofold (normal and paranormal) function.

The Pseudo-Gambling Experiment

Participants were first required to complete three scales (see below). They were then told that they would be participating in a forced-choice 'pseudo-gambling' card-identifying experiment, so called because they would not be required to make bets using their own money, although the decisions they made in the task would be made as if they were gambling. They were instructed to use hunches, guesswork, their 'sixth sense', and any other 'faculty' or mode of behaviour or apprehension they considered helpful in making a correct card selection. They were also informed that they would win or lose according to those decisions. In five trials, participants had to identify the correct location of five Aces of Spades while avoiding five Aces of Clubs. 'Instant Scratchies' tickets were paid-out for correctly identified Aces of Spades only (see *Procedures* below for details). The present study has three aims:

1. To gain insight into the nature of compliant and noncompliant pro attitudes.

2. To discover attitudes/dispositions conducive to a psychopractic (i.e., psi) effect using scores on the Kassinove's (1998) Gambling Attitude Scales (GAS), Singer and Loomis's (1996) Type Deployment Inventory (SL-TDI), and Darke and Freedman's (1997b) Belief in Good Luck (BIGL) scale.

3. To determine relationships between the three scales and subscales used (viz., the GAS, the SL-TDI, and the BIGL).

[4]For example: (1) Physics Intuition Applications, Inc., (online at: http://www.p-i-a.com/), (2) Richard Broughton's Intuition Laboratories, Inc., in Durham, NC, USA, and (3) the Perrott-Warrick Research Unit, Psychology Department, University of Hertfordshire, England (intuition research).

Parapsychological Hypotheses

The following parapsychological hypotheses were proposed. (The tests used are given in parentheses with each hypothesis.):

1. The number of correctly identified aces of spades (spade-hitting) is above chance, and the number of correctly identified aces of clubs (club-hitting) is below chance (P_{MCE} = 1.00; single-sample t test, one-tailed).

2. There is a negative relationship between spade-hitting and club-hitting (Pearson r).

3. Scores on the four GAS subscales correlate positively with spade-hitting, and negatively with club-hitting (Pearson's r).

4. Scores on the BIGL scale correlate positively with spade-hitting, and negatively with club-hitting (Pearson's r).

5. Scores on Extraverted Intuition (EN) correlate positively with spade-hitting, and negatively with club-hitting (Pearson's r).

6. Scores on Introverted Intuition (IN) correlate positively with spade-hitting, and negatively with club-hitting (Pearson's r).

All hypotheses are concerned with compliance (indicated by spade-hitting) and noncompliance (indicated by club-hitting).

Psychological Hypotheses

As discussed above, gambling, intuition, and belief in good luck may be interrelated. Therefore, the following specific hypotheses were proposed (Pearson r tests are used to test all three hypotheses):

1. Scores on the four GAS subscales correlate positively with EN scores, and negatively with IN scores (Pearson's r).

2. Scores on the four GAS subscales correlate positively with BIGL scores (Pearson's r).

3. BIGL scores correlate positively with EN scores, and negatively with IN scores (Pearson's r).

Method

Participants

A total of 100 participants volunteered for the experiment. The majority of the sample was comprised of University of Adelaide students at all levels, but mainly undergraduates, all of whom were invited to participate by lodging tear-off acceptance slips in a ballot box located in the Barr Smith Library on the University of Adelaide city campus. There was a minority of non-students found by word of mouth, including a subset of 12 members from the paranormal investigation group, PRISM International.[5] The total sample consisted of 45 males (45%) and 55 females (55%). The mean age was 26 years (SD = 10.75).

Measures

Three measures were used in the experiment:

1. Kassinove's (1998) Gambling Attitude Scales (GAS), which comprises four subscales measuring attitude towards gambling in 'general', 'casino', 'horse-racing', and 'lotteries'.

2. Singer and Loomis's (1996) Type Deployment Inventory (SL-TDI). The SL-TDI has eight subscales as follows: Introverted Sensing (IS), Introverted Intuiting (IN), Introverted Thinking (IT), Introverted Feeling (IF), Extraverted Sensing (ES), Extraverted Intuiting (EN), Extraverted Thinking (ET) and Extraverted Feeling (EF).

3. Darke and Freedman's (1997b) Belief in Good Luck Scale (BIGL), which is a 12-item scale designed to measure the level of belief in the concept of good luck.

Apparatus

Ten sets of material were used in the experiment: (1) four corkboard panels with wooden frames measuring approximately 450 x 600 mm (18 x 24 inches; each panel consisting of a 5 x 5 array of clips suitable for holding playing cards in place); (2) 20 packets of 'Queen's Slipper' brand playing cards (52 cards/deck); (3) five cards/hand comprised of

[5]PRISM International (Paranormal Research Investigation Services and Monitoring) is an amateur group of individuals interested in claims of the paranormal, and it conducts investigations into such claims. Members of PRISM International tend to believe in paranormal phenomena and to report paranormal experiences. There is anecdotal evidence that some members have psychic ability. L.S. thanks the president of PRISM International, Mr. Laurie Pearce, for his assistance in acquiring volunteers for the gambling experiment.

1 x Ace of Spades, 1 x Ace of Clubs, 3 x Kings, laid face-down in a row, each row constituting a trial (there are 5 rows, thus 5 trials); (4) 'Cling Wrap' clear plastic sheeting; (5) small, circular 'quik-stik' self-adhesive labels (colour: yellow); (6) Pagano's (1986, pp. 479–480) random number tables; (7) card selection record sheet; (8) information and instruction sheet; (9) picture chart showing the Ace of Spades and the Ace of Clubs; and (10) debriefing letter to participants.

Procedure

Stage 1 (questionnaires): Participants were required to complete the four measures (GAS, SL-TDI, and the BIGL scale).

Stage 2 (the gambling task): Participants were then required to complete the gambling task. The participant was presented with a 5 x 5 array of playing cards face-down (i.e., card pattern on top) and completely covered in clear plastic sheeting (total number of cards = 25). In a total of five trials (each row represents a trial), participants were required to locate in each trial the Ace of Spades in a 'hand' of five cards, all cards of which were face down so that their faces could not be seen with the naked eye (for each trial, p = .20).

Five 'Instant Scratchies' tickets of small cash value (but with high potential cash reward) were presented to the participant before 'gambling' commenced. Each time the participant won, s/he retained a ticket, but a failure to find the Ace of Spades meant the participant had to 'pay' out a ticket. The participant was free to stop the task at any time and take the winnings accrued as of the time of cessation of the task. Structured this way, the 'pseudo-gambling' task took on the dynamism of a real gambling task because the participant felt and/or thought that s/he was 'winning' or 'losing' without actually making a personal investment in the task.

An Ace of Clubs (a decoy) was also concealed in each of the five hands (for each trial, p = .20). Participants were instructed not to target Aces of Clubs. The decoy was necessary to test the hypothesis that significant overall success at the paranormal task of identifying aces of spades is evidence of a compliant pro attitude toward winning. Participants were thus requested to maintain a pro attitude towards the detection of the Ace of Spades only. However, should there be a significant number of hits on the decoy (i.e., the Ace of Clubs), then evidence would exist that undermines the assumption of sufficient compliance,

by showing that noncompliant pro attitudes can exist as well, and these can lead to psi-missing.

Playing cards were covered entirely with Cling-Wrap, and card selection was made by sticking an adhesive label onto the Cling-Wrap over the card of choice. Thus, the possibility of cheating was eliminated because the participant could not touch the cards, but could only indicate his/her choices with adhesive labels. The 5 x 5 card arrays were not prepared by the experimenter (L.S.), but by an assistant (either M.T. or A.B.).[6] The experimenter was not present during the randomised card-positioning process, and the locations of the cards were not made known to the experimenter prior to the trial. Positioning of the aces (spades and clubs) was by a random process using Pagano's (1986, pp. 479-480) random number tables. The cards were squared up in the 5 x 5 grid so that no single card stood out by way of a skew or tilt that might be regarded as a cue for, or a clue to, the participant.

Feedback by e-mail was given to all participants at a later date after questionnaires were scored.

Results

Preliminary Analyses

All 100 participants in the gambling experiment completed the GAS and BIGL scales, and five trials each in the forced-choice component of the experiment. All but one participant completed the SL-TDI. Using independent samples t tests, it was found that there were no significant differences on scoring between the PRISM group (n = 12) and the rest of the sample (n = 88) on the following measures: Ace of Spades hitting, Ace of Clubs hitting, the four GAS subscales, and the BIGL scale. There were significant differences on introverted intuiting, $t_{(97)} = -2.32$, p = .022, two-tailed, and extroverted intuiting, $t_{(97)} = -2.19$, p = .031, two-tailed. Hays (1963) formula[7] was used to calculate estimated effect sizes (omega-squared; ω^2) using the t statistic. It was found in both cases that approximately 4% only of the variance in the dependent variables was explained by group affiliation. This value falls short of the critical

[6]The experimenter, L.S. thanks M.T. (Michael Thalbourne) and A.B. (Alison Bruer) for their assistance. Both are researchers in the Anomalistic Psychology Research Unit, Department of Psychology, University of Adelaide.

[7]Hays (1963) recommends that omega-squared (ω^2) accompany the result of an independent-samples t test. When $t \leq 1$, the estimate of ω^2 = 0; when $t > 1$, estimated $\omega^2 = (t^2-1)/(t^2 + N_1 + N_2 - 1)$, where N_j is the size of each sample.

value of 9%, which is here deemed the minimum level of variance explained that would be functionally important (this convention has been used elsewhere in the first author's work—for examples, see Storm & Ertel, 2001; Storm & Thalbourne, 2001). Therefore, the two groups were treated as coming from the same population.

Parapsychological Hypotheses

Hypothesis 1: The number of correctly identified aces of spades (spade-hitting) is above chance, and the number of correctly identified aces of clubs (club-hitting) is below chance (P_{MCE} = 1.00). The number of aces of spades was above chance (M_{spades} = 1.02, *SD* = .82), but it was not significant, $t(99) = .245$, $p = .807$. The hypothesis was not supported, though the result was in the direction hypothesised. The number of aces of clubs was not below chance (M_{clubs} = 1.06, *SD* = .93). The directional hypothesis was not supported.

Hypothesis 2: There is a negative relationship between spade-hitting and club-hitting. Due to the two variables being semi-independent, the relationship between spade-hitting and club-hitting is likely to be negative, since the outcome on one variable limits the outcome of the other variable. That is, within-trial hitting is not independent, but between-trial hitting is independent. A negative relationship, however, is not guaranteed. For example, given that participants are expected to comply, it could be hypothesised that club-hitting is constant. Alternatively, although unlikely, club-hitting and spade-hitting could pair off for a majority of trials and/or cases due to approach-avoidance conflicts – the upper limit for spades and clubs would be 2.5 hits of each outcome (club or spade) per participant. Thus, even given the likelihood of 'ceiling' and 'floor' effects, it is possible that the relationship could be near constant, or even positive, so that, theoretically, the directional hypothesis could be rejected.

As it happened, there was a negative and significant correlation between the two types of hitting, $r_{(98)} = -.23$, $p = .011$, one-tailed. Thus, the relationship between the two types of hitting, although weak, was not constant in one variable for any given value in the other variable.[8]

By inference, the finding supports the earlier conjecture that if compliance is present, noncompliance tends not to be present. That is, if a

[8]Please note that the authors recognise the fact that a more valid result might be determined using the Monte Carlo method.

compliant pro attitude dominates, the noncompliant pro attitude tends to subside, and vice versa. However, a related-samples t test was performed with the participant as the unit of analysis and it was found that, taking into account the correlation between spade and club hitting, that neither variable significantly exceeded the other, $t_{(99)} = -.29$, p = .771 (two-tailed).

Hypothesis 3: Scores on the four GAS subscales correlate positively with spade-hitting, and negatively with club-hitting.

1. The relationship between *general gambling* and spade-hitting was not positive, but a negative relationship between *general gambling* and club-hitting *was* found. However, the correlation was not significant, $r_{(98)} = -.11$, p = .148, one-tailed. The hypothesis was not generally supported, although the direction was as hypothesised for the general gambling/club-hitting correlation.

2. The relationship between *horse racing* and spade-hitting *was* positive, but it was extremely weak and not significant, $r_{(98)} = .04$, p = .342, one-tailed. The relationship between *horse racing* and club-hitting *was* negative and significant, $r_{(98)} = -.26$, p = .005, one-tailed. The hypothesis was partially supported, with directions being correctly hypothesised for both correlations, and significant in one. The less positive participants were towards horse racing, the more they tended to hit on clubs. From this result, we infer a noncompliant pro attitude.

3. The relationship between *casino gambling* and spade-hitting was not positive, but a negative relationship between *casino gambling* and club-hitting *was* found. However, this correlation was very weak and not significant either, $r_{(98)} = -.07$, p = .250, one-tailed. The hypothesis was not supported, although the direction was as hypothesised for the casino gambling/club-hitting correlation.

4. The relationship between *lotteries* and spade-hitting was not positive, but a negative relationship between *lotteries* and club-hitting *was* found. However, this correlation was very weak and not significant either, $r_{(98)} = -.10$, p = .161, one-tailed. The hypothesis was not supported, although the direction was as hypothesised for the lotteries/club-hitting correlation.

Hypothesis 4: Scores on the BIGL scale correlate positively with spade-hitting, and negatively with club-hitting. The relationship between BIGL scores and spade-hitting was not positive, but the relationship between BIGL scores and club-hitting *was* negative, but not significant, $r_{(98)} = -.08$, p = .230, one-tailed. The two-part hypothesis was not supported, although the direction was as hypothesised for the BIGL scores/club-hitting correlation.

Hypothesis 5: Scores on Extraverted Intuition (EN) correlate positively with spade-hitting, and negatively with club-hitting. The relationship between EN and spade-hitting *was* positive, but not significant, $r_{(98)} = .09$, p = .192, one-tailed. The relationship between EN and club-hitting was not negative. The hypothesis was not supported, although the direction was as hypothesised for the EN/spade-hitting correlation.

Hypothesis 6: Scores on Introverted Intuition (IN) correlate positively with spade-hitting, and negatively with club-hitting. The relationship between IN and spade-hitting *was* positive, but not significant, $r_{(98)} = .13$, p = .104, one-tailed. The relationship between IN and club-hitting was not negative. The hypothesis was not supported, although the direction was as hypothesised for the IN/spade-hitting correlation.

Psychological Hypotheses

Hypothesis 7: Scores on the four GAS subscales correlate positively with EN scores, and negatively with IN scores. There were no significant correlations between the subscales of the GAS and EN, although they were in the direction hypothesised. There were no significant correlations between the subscales of the GAS and IN, although they were in the direction hypothesised.

Hypothesis 8: Scores on the four GAS subscales correlate positively with BIGL scores. There were four correlations to be tested in this hypothesis, and all four were positive and significant. Table 1 lists these correlations.

While the correlations listed in Table 1 do not suggest a causal relationship between attitudes towards gambling and belief in good luck, a common-sense relationship is evident in the fact that pursuing an indulgence in various forms of gambling (at least as measured on the GAS

Table 1: Pearson's r Correlations between the Four GAS Subscales and BIGL Scores

Variable	r	p^a
General Attitude	.25	.006
Casino Gambling	.21	.020
Horse Racing	.17	.048
Lotteries	.24	.008

[a] df = 98; p values are one-tailed.

subscales) would carry with it a desire in the typical gambler to win, and since chance plays such a big part in winning, a corollary of wishing to win would be a concomitant belief in good luck.

Note that the four subscales correlate highly with each other, so it is to be expected that the four significant correlations in Table 1 may be artifacts due to the interrelatedness of the subscales (see Table 2). This result is also a possible explanation for the general failures of the sub-hypotheses in Hypothesis 3 to be confirmed.

Table 2: Pearson's r Correlation Matrix for the Four GAS Subscales

Variable[a]	General Attitude	Casino Gambling	Horse Races
Casino Gambling	.88	-	-
Horse Races	.67	.58	-
Lotteries	.51	.42	.37

[a] df = 98; all correlations are significant at the .01 level (1-tailed).

Hypothesis 9: BIGL scores correlate positively with EN scores, and negatively with IN scores. The relationship between BIGL scale and EN scores was positive, but not significant, $r_{(98)} = .01$, p = .486, one-tailed. The relationship between BIGL scale and EN scores was also positive, but not significant, $r_{(98)} = .09$, p = .183, one-tailed.

Post Hoc Analyses

Attitude towards horse-racing as a necessary condition: The negative and significant horse-racing/club-hitting correlation warranted a median-split analysis of the sample to determine if low scores on attitude towards horse-racing were a necessary condition in bringing about significant club-hitting (as a necessary condition, it is taken as completing the ensemble of necessary conditions that constitutes a sufficient

condition for psi in this experiment).

The median score for horse-racing in the moderate group was 24. Low scorers (< 24) produced a mean hit-rate of 1.27 clubs (*SD* = .804; *ES* = .13), which was significant, $t_{(48)} = 2.10$, p = .041, two-tailed. It appears that a negative attitude (scores below 24) elicits noncompliant psi-hitting.

High scorers (> 24) produced a mean hit-rate of .78 clubs (*SD* = .704; *ES* = $-.10$), which was also significant, $t_{(44)} = -2.12$, p = .040, two-tailed It appears that a positive attitude (scores above 24) elicits avoidance of noncompliant psi-hitting.

A Reconsideration of the GAS: The present study sought to find relationships between scores on the subscales of the GAS and psi performance. These relationships were thought to be linear. However, from the mostly nonsignificant results relevant to the GAS subscales found above, there seemed to be good reason to reconsider the GAS, with particular emphasis on the underlying influence of gambling attitudes on the correlations tested in this hypothesis.

It was conjectured that extreme attitudes on gambling may inhibit other functions, including the psi function – low scorers would have an uncooperative attitude, which may interfere with psi, whereas high scorers, even with a cooperative attitude, may suffer the negative consequences of 'heightened anxiety' as a result of trying too hard (for a similar case, see Broughton & Alexander, 1997).

'Moderate' scores on the GAS scales, however, might reflect a type of individual who is even-keeled on the subject of gambling. Such a participant, free from the constraints of bias for or against gambling, *general* or in its various forms (i.e., *horse-racing*, *casino*, and *lotteries*), may be able to use his or her psi function in an unencumbered manner. Thus, moderate scores may still show a linear relationship with psi scores, as originally hypothesised, and this group of 'gambling moderates' may produce different results from those already found in Hypothesis 5 and 6 (Testing Hypotheses 3 and 4 would not be wise as the low n and limited variance of each subscale would adversely affect the outcomes).

Following this rationale, scores for the four scales were combined into an unbiased aggregate gambling score by totalling the four scores of the four GAS subscales. The aggregate score absorbs the diverse effects of the various attitudes on the subscales. The sample was then divided

into three groups ('low' scorers: n = 34; 'moderate' scorers: n = 33; and 'high' scorers: n = 33) based on aggregated scores.

When Hypotheses 5 and 6 were retested for the three groups, only the 'moderate' group produced significant correlations, of which there were four: (i) spade-hitting with EN, $r_{(31)} = .31$, p = .042, (ii) spade-hitting with IN, $r_{(31)} = .32$, p = .037, (iii) club-hitting with EN, $r_{(31)} = -.28$, p = .05, and (iv) club-hitting with IN, $r_{(31)} = -.34$, p = .027 (all tests were one-tailed).

Note that scores on the IN and EN sub-scales correlate significantly so that there is some degree of nonindependence between these two variables, $r_{(31)} = .65$, $p < .001$, two-tailed. This fact may account for these four significant correlations. When partial correlation analyses were conducted controlling for and EN and IN, the aggregated score of Intuiting (EN and IN combined) correlated positively and significantly with spade-hitting, $r_{(31)} = .34$, p = .025, and negatively and significantly with club-hitting, $r_{(31)} = -.34$, p = .025 (both tests were one-tailed). These results suggest that Intuiting (provided that the measure is the aggregated score on Intuiting) is a predictor of psi effects, but only when the score on aggregated attitude towards gambling is a moderate one.

Effect sizes, spade-hitting and club-hitting: The gambling experiment is a typical forced-choice experiment, the domain of which has a very low, but significant effect size (*ES* = .012; see Milton, 1998). Therefore, Hypotheses 1 and 2 were not likely to be supported, given the relatively small sample size (N = 100), and the fact that only a participant-based calculation of the numbers of hits was tested. On this basis, hit-rates, trial-based z scores, and effect sizes for the two types of hitting were calculated (see Table 3). Note that the use of trial-based z scores and effect size estimates follows Honorton and Ferrari's (1989) observation that "most parapsychological experiments . . . have used the trial rather than the subject as the sampling-unit" (p. 283). These comparisons are made against Honorton and Ferrari's calculation of the z score and *ES* norms for the forced-choice domain (viz., z = .38; *ES* = .012).

Rosenthal (1986) recommended that the "conceptual confusion" (p. 316) over replication can be eliminated by focusing on "effect size as the more important summary statistic" (p. 319) because degree of success or failure is more useful than a misleading "dichotomous decision" (p. 319) set up by a dependence on the value of p. Thus, if an effect size

Table 3: Trials, Hit-Rates, Trial-Based Z Scores and *ES* Scores for Spade Hitting and Club Hitting (N = 100)

Hitting Variable	Total Trials	Total Hits	Proportion of Hits	Z score	*ES*[a]
Aces of Spades	500	102	.204	.170	.008
Aces of Clubs	500	106	.212	.615	.028

[a]The estimate of effect size $z/n^{1/2}$ is used here, where z scores are 'exact'

in one study is not significantly different from that of a previous study, replication has been achieved.

From Table 3 it can be seen that the *ES* is higher on club-hitting than spade-hitting. The *ES* norm for the forced-choice domain falls between these two rates of hitting, with spade-hitting below the mean *ES* norm, and club-hitting above the norm, but the two forms of hitting were not significantly different from each other, $\chi^2_{(1,N=1000)} = .019$, p = .891 (for the formula used to calculate the chi-squared value, see Rosenthal & Rubin, 1989). Without further testing, it is logical to conclude that these two effect sizes are not only comparable with the significant psi effects reported for the forced-choice domain, but are replications of those effects as well. These results also suggest that the noncompliant pro attitude had more influence than the compliant pro attitude, although the difference appears to be a chance fluctuation only.

Success Rates (Planned Analyses Only)

Thirty-one planned tests were conducted in the present study. Only six were significant (19%). Seventeen tests were conducted for the parapsychological hypotheses—only two were significant (12%; above chance, although two significant outcomes is only one above what would be expected by chance), but 11 were in the directions hypothesised (65%), which is more than half that would be expected by chance.

Fourteen tests were conducted for the psychological hypotheses—four were significant (29%; well above chance), and all were in the directions hypothesised (100%).

One major disadvantage to the experiment was the strong interrelatedness of the four GAS subscales (see Table 2). Thus the tendency for failure to reach significance in one Pearson's r test where a GAS subscale was a variable, virtually guaranteed failure in Pearson's r tests where other GAS subscales were variables.

Discussion

There were three aims in the present experiment:

1. To gain insight into the nature of compliant and noncompliant pro attitudes.

2. To discover attitudes/dispositions conducive to a psychopractic (i.e., psi) effect using scores on the GAS, the SL-TDI, and the BIGL scale.

3. To determine relationships between the three various scales and subscales used (viz., the GAS, the SL-TDI, and the BIGL).

These are now discussed.

Compliance and Noncompliance

The problem of compliance rests hand-in-hand with the concept of the pro attitude because the experimenter can play a pivotal role in the construction of the participant's pro attitude, and he or she does this under the expectation of compliance in the participant. Compliance was proposed as being an important concomitant of the pro attitude. Take away compliance, and the possibility exists that the goal, on which the concomitant pro attitude is meant to be focused, may not manifest. It would then only be possible to *infer* the presence of a pro attitude if a measurable effect did not manifest. A mere inference, however, would be inadequate for parapsychology, and on that basis some researchers might prematurely dismiss the pro attitude concept altogether. Hence the importance of *sufficient* compliance in a sample, in the sense that its presence underscores a sufficient number of compliant pro attitudes, which may lead to a psi effect that we argue is indicated by a significant result.

Given the hypothesis that some pro attitudes can be oppositional to each other, it was further proposed that evidence of psi-missing (i.e., noncompliant hitting) could be used to indicate the presence of noncompliant pro attitudes. This discovery would give the researcher a second chance at nailing down the presence of a pro attitude of sorts, even if it was a noncompliant one. The question that must therefore be asked is: "Was there evidence of compliant and/or noncompliant pro attitudes during the experiment?"

It must first be stated that some degree of effort was made in the present experiment to limit the outcomes to two types of psi. Participants were thus set up, as it were, to choose between two alternative forms of targeting. This protocol encouraged certain types (most likely

believers in the paranormal) to adopt a compliant pro attitude (it is tacitly understood that believers would endeavour to adopt a compliant pro attitude), whereas certain other types (most likely skeptics naïve to statistical testing of psi) had the opportunity to adopt alternative but noncompliant pro attitudes of their own devising (extreme skeptics, for example, might target aces of clubs, even though they stood to lose 'Instant Scratchies' tickets, while moderate skeptics might default to king cards). Structured this way, the protocol attempted to eliminate a number of possible strategies on the part of skeptics by 'forcing' them to adopt only one of a limited number of noncompliant pro attitudes. (Note that it is assumed that both skeptics and believers were present in the experiment, as is the case in randomised psi experiments.) This protocol was meant to help participants focus their psi, thereby giving the experiment more power.

In the present study, a successful hit-rate in the 'Ace of Spades' task could be taken to mean that the assumption of *sufficient* compliance had been met, and therefore, that a compliant pro attitude had been held by a *sufficient* number of participants (see again, our *caveat* in footnote 2). Likewise, a successful hit-rate in the 'Ace of Clubs' task could be taken to mean that noncompliant pro attitudes had been held by a *sufficient* number of participants.

In either case, the sample did not produce a significant number of hits on spades or clubs as measured on participant-based counts, although the effect sizes for both forms of hitting, as measured on trial-based counts, were not significantly different from the mean effect size norm for the forced-choice domain. There appeared to be evidence of replicated psi effects, so that both forms of 'hitting' (spade-hitting and club-hitting) suggested that compliant and noncompliant pro attitudes, respectively, were present during the experiment. We argue that this conclusion is a sound theoretical inference.

It was also shown that the presence of a compliant outcome (i.e., spade-hitting) tended to indicate the absence of noncompliant pro attitudes (i.e., club-hitting; see Hypothesis 2). Thus is inferred an inverse relationship between the compliant pro attitude and the noncompliant pro attitude, although we are aware of the fact that the two types of hitting are only partially independent. Notwithstanding that limitation, this negative relationship is an important one. It indicates that there may be a negative relationship between compliant psi and noncompliant psi.

Attitudes and Dispositions as Necessary Conditions for Psi

This study attempted to find necessary conditions for paranormal performance. No relationships were found between (a) psi scores and belief in good luck (BIGL), (b) psi scores and Extraverted Intuiting (EN), or (c) psi scores and Introverted Intuiting (IN). Only one of the four GAS subscales (horse racing) correlated negatively (as hypothesised) and significantly with club-hitting, suggesting that the more negative the attitude is towards horse racing, the greater the tendency towards noncompliant psi targeting (i.e., in traditional terms, psi-missing). It is possible that this trend did not extend into a significant relationship between horse racing and compliant psi targeting (i.e., psi-hitting) because participants may have been disturbed by cognitive dissonance in the form of a movement against the use of animals in sport, and benefiting financially from that arrangement.

In the post hoc analysis, a median-split analysis revealed that a negative attitude towards horse-racing was a necessary condition that made complete the ensemble of conditions that was sufficient for bringing about psi-missing (i.e., club-hitting).

It was also argued (post-hoc) that a moderate attitude towards gambling (measured using an aggregated score of the four gambling scales) would be psi-conducive because the 'moderate' participant was free from the inhibitory effects of extreme viewpoints about gambling, which might 'scramble' the psi function, and/or the intuitive function, and/or belief in good luck. Insofar as 'low' and 'high' scorers were excluded from the analysis, the assumption that relationships between the relevant variables are linear ran counter to the proposed hypotheses where Pearson's r tests were conducted.

It was also found (post-hoc) that EN and IN were predictors of both spade-hitting and club-hitting, but further analysis revealed that EN and IN were non-independent variables. Partial correlation analyses and further bivariate analyses revealed that aggregated Intuiting scores correlated positively and significantly with spade-hitting and negatively and significantly with club-missing. Thus, it appeared that the relationship between psi and Intuiting seemed to be tempered by the effect of a moderate attitude towards gambling. In terms of psychopraxia, if the participant held a moderate attitude towards gambling, an exosomatic effect (either psi-hitting or psi-missing) seemed more likely if the participant scored high on aggregated Intuiting. Thus,

Jung's (1977) claim that intuition was a function that assisted gamblers in their decision-making is supported by our findings, but it is not clear what factor determines hitting from missing since Intuiting scores predict both.

The Relationship between Gambling, Belief in Good Luck, and Intuition

Psychological relationships between seven scales (i.e., four GAS subscales, IN and EN on the SL-TDI, and the BIGL scale) were hypothesised (see Hypotheses 7, 8 and 9). There was no evidence that EN and IN are related to the GAS (Hypothesis 7), but relationships were found consistently between gambling and belief in good luck – all four GAS subscales correlated significantly with the BIGL scale and in the directions hypothesised (Hypothesis 8). Therefore, gambling and belief in good luck seem to be related in a way that common sense would dictate. There was no evidence that EN and IN are related to the BIGL scale. However, tentative support for all the hypothesised relationships discussed in this subsection came in the form of a 100% success rate in regard to directions hypothesised.

Conclusion

While the parapsychological results are mainly inconclusive, some findings relating to intuition and attitude towards gambling warrant further investigation. In regard to those findings, we inferred the relationships between pro attitudes (compliant and noncompliant) and psi. However, the natures of these two types of pro attitude need further clarification through continued empirical research. This research should necessarily include administering direct measures of pro attitude, which should be both *self-attributed* and *implicit* in form. That is, given the hypothesised nature of the pro attitude, it is important to consider, and attempt to measure conscious *and* unconscious pro attitudes. These possibly incompatible pro attitudes may give answers to the nature and mechanism that underlies compliance and noncompliance in psi testing.

The pro attitude may also prove to be an important concept for parapsychology in another sense. In the present study, it was hypothesised to be an initiating force that underlies psychopractic action, since it would be integrated within the ego/Self structure. The pro attitude (especially that of the skeptic), on the one hand, and the experimenter effect, on the other, are often noted to be in an antagonistic relationship.

Still to be determined is the degree to which each contributes towards the psi effect.

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Participant Variables Associated with Psi Ganzfeld Results

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Abstract

In order to maximise the possibility of finding a psi effect it is important to be able to select the participants most likely to succeed in psi experiments. Psi Ganzfeld studies usually compare successful participants with unsuccessful ones when exploring psi conducive variables and usually employ a design that results in a 25% chance scoring rate. Due to the 25% chance scoring rate, for an overall significant experimental series, the group of successful sessions might be a mixture of "chance" hits and "psi" hits. This confounds any conclusions made from the results of studies exploring psi conducive variables. Because of the problem, the present study used a Ganzfeld set-up with double trials so that three outcomes were possible, success in one or two trials, or misses in both trials. The mean chance expectation for succeeding in two trials was reduced to 6.25%. Earlier studies have suggested that extraversion, schizotypy, meditation habits, and paranormal beliefs and experiences are participant variables that serve as predictors of Ganzfeld success. Overall, this study found no significant group differences regarding these variables. However, a serious problem with this study was that the overall Ganzfeld result was at chance level and that the two hits outcome group was extremely small.

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Introduction

Since the beginning of psi[1] experimentation, there has been an interest to find participant predictor variables for psi success. One reason for this is to maximise the possibility of finding a potential psi effect. Another reason is to explore individual differences in order to gain a better understanding of the psi process (Dalton, 1997). Since psi seems to be an elusive phenomenon, it is important to maximise the possible effect by studying individuals with the highest potential to be successful in the laboratory.

Psi laboratory studies are often designed so that a target, for example a picture or a film clip, is randomly chosen from a set of possible targets, often four. The subject taking part in the study tries to gain knowledge about the target content through paranormal means without knowing what the target is. Often the subject talks out loud about the impressions he or she gets from the target. At the evaluation stage, the participant or an external judge tries to match this talk with one of the four possible targets. That means that there is one chance in four to choose the target picture or film clip that was actually used in the experiment. If the right picture or film clip is chosen this is called a hit whereas a miss means that a decoy picture or film clip was chosen. Data is usually collected from a group of participants and analysed group wise. If the group as a whole has scored significantly more hits than can be explained by chance then the psi experiment is considered successful.

Many studies have tried to describe successful psi participants but they have shared the problem that in a group of successful participants some of them might have produced hits possibly due to psi, while others' success can be explained by chance. It is impossible to know exactly which individuals produced hits due to chance.

A new technique used to investigate psi has been developed in Göteborg (Goulding, Westerlund, Parker & Wackermann, 2004). This is a digital Ganzfeld technique and its present design allows every individual to participate in two successive sessions. The Ganzfeld is a mild sensory deprivation technique developed in the 1970's to detect psi (Braud, Wood & Braud, 1975; Honorton & Harper, 1974; Parker, 1975). Usually it is set up as a telepathy experiment involving two participants; one "sender" who tries to affect the imagery of a "receiver" in accor-

[1]The term psi is used to denote anomalous processes of information transfer, such as ESP, that are currently unexplained in terms of known physical or biological mechanisms (Bem & Honorton, 1994).

dance with the content of a randomly chosen target. Ganzfeld studies usually use one target and three decoys. Consequently, the mean chance expectation for a successful outcome is 25%. However, if a participant does two sessions in a row involving two randomly chosen targets, each with three decoys, then the mean chance expectation for a session in which both targets have correctly been identified is reduced to 6.25%. This allows for the possibility to measure personality — and other predictor variables for psi success making chance variation less likely to affect the result of these variables. A hit group where the mean chance expectation is 6.25% contains more psi hits than a hit group where the mean chance expectation is 25%. Therefore, analyses comparing a 6.25% hit group with a miss group regarding participant variables will obtain less biased results since any differences between hitters and missers are more likely to be differences between psi hitters and missers.

Variables associated with psi success

In a meta-analysis of well-controlled Ganzfeld experiments (Bem & Honorton, 1994), successful participants were described as strong believers in psi: they reported paranormal experiences, they had training in meditation or other mental disciplines, and they had high scores on the Feeling and Perception factors of the Myers-Briggs Type Indicator (Myers & McCaulley, 1985). Success was also correlated with the personality trait extraversion and creative ability. Since the publication of this meta-analysis (Bem & Honorton, 1994), some of the results have been successfully replicated by some studies but not by others (see Dalton, 1997 for a review).

Recently, some other participant variables have been reported to correlate with experimental success. One of those is schizotypal personality (Lawrence & Woodley, 1998; Parker, 2000) Unfortunately, schizotypy has usually been measured by the Magical Ideation Scale (Eckblad & Chapman, 1983), which is a limitation since this scale is only associated with one of the three, or possibly four factors making up the construct of schizotypy (Claridge et al., 1996). The Magical Ideation Scale (Eckblad & Chapman, 1983) loads on a schizotypy factor that concerns aberrant perceptions and beliefs. Previous research has shown that the Magical Ideation Scale is positively correlated with paranormal beliefs and experiences even when the paranormal items have been removed from it (Thalbourne & Delin, 1994). Paranormal experiences and beliefs are included in the aberrant perceptions and beliefs factor (American

Psychiatric Association, 1994). Aberrant perceptions and beliefs can be seen as milder versions of hallucinations and delusions found in psychoses (Mason, Claridge & Jackson, 1995). The second schizotypy factor is concerned with cognitive difficulties together with social anxiety (Mason et al., 1995). The third schizotypy factor taps the negative symptoms found in psychosis such as social withdrawal and an inability to experience pleasure (Mason et al., 1995). Finally, the fourth possible schizotypy factor concerns nonconformity, but no consensus has been reached so far about its status as a true schizotypy factor (Day & Peters, 1999).

Schizotypy relates to mental ill-health, predicting in particular schizotypal personality disorder and psychosis (e.g., American Psychiatric Association, 1994; Meehl, 1990). However, the schizotypy factor concerning aberrant perceptions and beliefs on its own does not seem to be related to mental ill-health but in fact may have an inverse relationship (Goulding, 2004, 2005; McCreery & Claridge, 1995, 1996, 2002; Simmonds, 2003). Since most previous studies linking psi Ganzfeld success with schizotypy have been limited to only investigate the aberrant perceptions and beliefs factor of schizotypy (but see Simmonds, 2003), it is unclear if the construct schizotypy is associated with psi success or if this is only true for this particular schizotypy factor. Moreover, the association between psi success and schizotypy is also of importance from a health perspective. Although schizotypy might be associated with mental ill-health, it does not seem like the aberrant perceptions and beliefs factor on its own is. As a result of this, genuine psi success or merely having paranormal beliefs and experiences might not show any association with mental ill-health. Whatever the case, it seems clear that it is important to study the whole construct schizotypy in relation to psi success in order to gain more information about the psi-successful individuals.

A recent meta-analysis of Ganzfeld studies (Milton & Wiseman, 1999) concluded that it was impossible to assess whether the new studies matched those of the earlier meta-analysis (Bem & Honorton, 1994) in terms of successful participant variables because not enough data regarding individual differences were reported (Milton & Wiseman, 1999). This reinforces the importance of reporting the results of participant variables when conducting psi studies regardless of the psi result. However, as said earlier, it is possible that some of the differences between successful and unsuccessful psi participants found so far re-

garding psi conduciveness might be caused by the so-called "chance" hitters. If the hit group is a mixture of a few hits possibly due to psi and more chance hits, then it is very problematic to interpret differences found between this mixed hit group and a group of missers. Any differences between the two groups might be a result of the contribution made from the chance hitters. Alternatively, there might be real differences between psi hitters and missers but they are obscured by the noise contributed by the chance hit group.

The present study is an extension of a Ganzfeld study aimed to evaluate a new digital Ganzfeld technique (Goulding et al, 2004). Before the Ganzfeld study started it was decided that there would be three possible outcome groups. One group consists of trials where an independent judge failed to identify any of the two target, one group is trials where one target of two is correctly identified, and the last group consists of trials where both targets are correctly identified. For information about the Ganzfeld study, see Goulding et al (2004). The present study was designed to explore differences between participants of these three groups. In practice however, the overall Ganzfeld result (Goulding et al, 2004) did not exceed the mean chance expectation and only three participants achieved a level of scores in which both targets were correctly identified. Consequently, the outcome of the Ganzfeld study severely limits the analyses of the participant variables and the results presented here are effectively a tentative case study.

This study aimed to explore psi conducive variables related to the characteristics of the "receiver" taking part in the Ganzfeld. Among the "receiver" variables, some are thought to be associated with psi success, whereas some are included to explore the association between psi success and mental health. In line with the results of previous studies (e.g., Bem & Honorton, 1994; Dalton, 1997; Parker, 2000), successful participants were expected to have higher levels of paranormal beliefs and experiences, extraversion, the aberrant perceptions and beliefs factor of schizotypy, sense of coherence, and meditation compared to unsuccessful participants but lower levels of neuroticism, the cognitive difficulties and social withdrawal factors of schizotypy, and help seeking because of their paranormal experiences. The group differences were explored with analyses of variance and chi-square tests.

Method

Design

This study used a recently developed digital Ganzfeld technique (Goulding et al., 2004). In order to reduce the mean chance expectation in a sub-group of hitters, every "receiver" participated in two successive Ganzfeld sessions; two targets were sent during the same sending period. This meant that there were three possible outcome groups. One group where an external judge failed to identify any of the two targets, using direct hits as the outcome measure; one group where the judge managed to identify one of the two targets; and a third group where the judge managed to identify both targets. These three outcome groups were compared regarding the participant variables described below.

Participants

An advertisement was placed in the main Göteborg morning paper asking for people who wanted to take part in a research project about paranormal phenomena. It asked specifically for people who had experienced paranormal phenomena. Interested people contacted the researchers via telephone. Those who had had paranormal experiences, did not show obvious signs of psychopathology, were Ganzfeld novices, and were over the age of 18 were invited to participate.

The 64 participants were the same that took part in the Ganzfeld study (Goulding et al, 2004). The mean age was 46.8 years (SD = 12.3, range = 22 – 74 years). There were 54 women and 10 men. They were all Ganzfeld novices and they all reported subjective paranormal experiences. 11 of the participants brought friends with them to act as "senders". There were 37 participants in the no correctly identified targets group, 24 participants in the one correctly identified target group, and 3 participants in the two correctly identified targets group.

Materials

The Australian Sheep-Goat Scale: The Australian Sheep-Goat Scale (ASGS; Thalbourne & Delin, 1993) was used to measure paranormal beliefs and experiences. More specifically, it measures beliefs and experiences of extrasensory perception (ESP), psychokinesis (PK), belief in life after death, and belief in the possibility of communicating with spirits of dead people. The ESP sub-scale consists of 11 items, for example: 'I believe I have had at least one experience of telepathy between myself

and another person'. The PK sub-scale consists of 5 items, for example: 'I believe I have personally exerted PK on at least one occasion'. The belief in life after death sub-scale consists of 2 items: 'I believe in life after death', and 'I believe that some people can contact spirits of the dead'. The answer alternatives are yes, unsure, or no, which are scored as two points, one point, and no points, respectively. The range for this scale is 0 – 36. The Cronbach alpha measure of internal consistency was found to be .94 and the test-retest reliability was .66 for the ASGS (Thalbourne & Delin, 1993). The items in the original version of the ASGS are grouped according to the sub-scales starting with the ESP items. To avoid eventual order effects, the author mixed the items of the ASGS. The Cronbach alpha measure of internal consistency for the Swedish ASGS was .91.

The Eysenck Personality Inventory: Form A of the Eysenck Personality Inventory (EPI; Eysenck & Eysenck, 1964) was used to measure the personality traits extraversion and neuroticism. The Extraversion sub-scale consists of 24 items, an example being: "Do you usually 'speak first and then think'?" The Neuroticism sub-scale is made up of 24 items, for example: Do you usually worry about things you shouldn't have said or done?" The answer format for the EPI is yes or no, scored as one point and no points respectively. Thus, the theoretical range for the Extraversion and Neuroticism sub-scales is 0 – 24. Test-retest reliability was .78 for both the Extraversion and Neuroticism sub-scales in the Swedish EPI (Bederoff-Petersson, Jägtoft & Åström, 1971).

The Oxford-Liverpool Inventory of Feelings and Experiences: Three sub-scales from the Oxford-Liverpool Inventory of Feelings and Experiences (O-LIFE; Mason et al., 1995) were used to measure schizotypy; Unusual Experiences (UE), Cognitive Disorganisation (CD), and Introvertive Anhedonia (IA). The 30 items of the UE sub-scale are thought to be consistent with the positive symptoms of psychosis, aberrant perceptions and beliefs, and the sub-scale contains perceptual, hallucinatory, and magical thinking items (Mason et al, 1995). An example of an item from this sub-scale is: 'Are your thoughts sometimes so strong that you can almost hear them?' The 24 items of the CD sub-scale describes difficulties with attention, concentration, and decision-making, together with a sense of purposelessness, moodiness, and social anxiety. These

features of schizotypy are thought to correspond to the cognitively positive symptoms of schizophrenia (Loughland & Williams, 1997). An example of an item from this sub-scale is: 'Are you sometimes so nervous that you are blocked?' The 27 IA sub-scale items tap a lack of enjoyment of social situations. Introvertive Anhedonia indicates a dislike of emotional and physical intimacy. This sub-scale is thought to be related to the negative symptoms of schizophrenia (Carpenter, Heinrichs & Wagman, 1988). An example of an item from this sub-scale is: 'Do you feel very close to your friends?' The Impulsive Nonconformity sub-scale of the O-LIFE was not used in this study to measure schizotypy because no consensus has been reached regarding its status as a schizotypy factor. The Impulsive Nonconformity sub-scale does not concern schizotypy per se and might instead be regarded as an antisocial personality factor (Day & Peters, 1999; Loughland & Williams, 1997).

The range for the three sub-scales combined was 0 – 81. Psychometric evaluation of the O-LIFE has shown good test-retest reliability, (coefficient alpha = .80; Loughland & Williams, 1997), as well as acceptable internal consistency (coefficient alpha $>$ .77; Mason et al, 1995). The Cronbach alpha measure of internal consistency was .89 in the Swedish O-LIFE. Since the EPI has the same, dichotomous answering format as the O-LIFE, and its sub-scale Extraversion has been used as filler items for the O-LIFE in earlier studies (Mason et al., 1995), the EPI and O-LIFE items were allocated a random order and made into one questionnaire.

The Sense of Coherence Scale: The Sense of Coherence (SOC; Antonovsky, 1991) Scale is a health-related measure consisting of three components: 'Meaningfulness', 'Manageability', and 'Comprehensibility'. Meaningfulness is an emotional component related to the degree of influence and involvement in what happens. Manageability taps the subjective sensation of possessing or lacking sufficient resources to deal with different situations in life. Comprehensibility is a cognitive component dealing with order and structure. The Meaningfulness component consists of 8 items, an example being: 'Do you have the feeling that you don't really care about what goes on around you?' The answering format is a 7–point rating scale whose end points differ depending on the question asked. The end points for the above example are 'very seldom or never' and 'very often'. The Manageability component consists of 10 items, an example being: 'Do you have the feeling that you're

being treated unfairly?' The Comprehensibility component consists of 11 items, an example being: 'When you talk to people, do you have the feeling that they don't understand you?' High points on this scale are interpreted as high sense of coherence. The SOC construct refers to a global orientation to one's inner and outer environments, which is thought to be a significant determinant of location and movement on the health - ill-health continuum (Antonovsky, 1993). Although the SOC Scale cannot be said to be equivalent to health, it is reported to covary strongly with subjective and objective measures of physical and mental health (Antonovsky, 1991, 1993; Ebert, Tucker & Roth, 2002; Larsson & Kallenberg, 1996, 1999; Pallant & Lae, 2002). A person with strong SOC has better opportunities to manage stress and stay healthy than a person with weak SOC (Antonovsky, 1991, 1993; Larsson & Kallenberg, 1996). The range of the SOC Scale is 29 – 203. Different studies have shown the Cronbach alpha measure of internal consistence to range between .82 and .95, whereas test-retest reliability ranges between .41 and .97 (Antonovsky, 1993).

Questions on age, sex, meditation habits, psychiatric history: Apart from the above measures the participants were also asked questions concerning their age, sex, if they are currently involved in some mental discipline like meditation, or if they previously have been involved in such a mental discipline. They were also asked if the paranormal experiences they had, ever caused them to seek help in the form of going to see a psychologist, psychiatrist, general practitioner, or if the paranormal experiences had caused hospitalisation.

Procedure

The participants were sent a pack of information about the Ganzfeld experiment and questionnaires to fill in and return. The questionnaires were sent out in the same order to all the participants: questions regarding age and sex, the Australian Sheep-Goat Scale (Thalbourne & Delin, 1993), the Sense of Coherence Scale (Antonovsky, 1991), questions regarding psychiatric history and meditation habits, and finally, a mixed version containing the items from the Eysenck Personality Inventory (Eysenck & Eysenck, 1964) and the Oxford-Liverpool Inventory of Feelings and Experiences (Mason et al, 1995). When the participants had returned the questionnaires they were contacted and a date was set up for a Ganzfeld experiment. The questionnaires were

collected and kept until the Ganzfeld data collection had finished, first then the questionnaire data were analysed.

The Ganzfeld experiment largely followed a standard procedure. However, there were some differences. One difference was that every "sender-receiver" pair participated in two successive trials. This meant that while the "receiver" underwent the Ganzfeld relaxation procedure, two targets (short film-clips) each with three decoys, were randomly chosen and shown to the sender. The first target was shown during approximately fifteen minutes (a short film-clip was repeated seven times), and then the second target was shown for fifteen minutes. An independent judge rated the similarity between the mentation and the film clips, and the Ganzfeld result was assessed using direct hits as the outcome measure. For a more detailed description of the procedure, see Goulding et al (2004).

Results

The overall Ganzfeld result was non-significant (23% hits, p = .39, one-tailed, binomial test) as measured by direct hits, the sessions being evaluated by an independent judge. The effect size π (Rosenthal & Rubin, 1989), was .47 where .50 was expected under the null hypothesis.

There were no significant differences between the Ganzfeld outcome groups on any of the participant variables. The means and standard deviations from the different questionnaires are reported in Table 1. All three outcome groups had a high level of paranormal beliefs and experiences (ASGS). The largest (non-significant) group differences were those between the one hit outcome group and the two hits outcome group on all variables. The groups differed most on the variable Neuroticism (N); in this case the group difference approached statistical significance (p = .06).

Table 2 shows how the participants answered the questions on meditation and help seeking. None of the participants had been hospitalised but two persons said that they had sought professional help due to their paranormal experiences. These participants belonged to the one hit Ganzfeld outcome group. Since some chi-square cells had an expected count less than five, exact significance tests were selected for the Pearson chi-square analyses. Again, there were no significant differences between the three Ganzfeld outcome groups on these measures.

Table 1: Means, standard deviations, and ANOVA results for the different Ganzfeld groups with regard to the different scales used

Measure	Ganzfeld result group: No hit (N = 37)		One hit (N = 24)		Two hits (N = 3)		ANOVA[a]	
	Mean	*Sd*	*Mean*	*Sd*	*Mean*	*Sd*	*F*	*p*
Neuroticism	8.8	4.6	10.5	3.6	4.7	2.9	3.0	.06
Extraversion	13.0	4.0	10.8	3.6	13.0	3.6	2.3	.11
Cognitive Disorganisation	6.6	5.5	7.6	4.8	4.0	3.0	.7	.48
Unusual Experiences	14.5	5.6	14.8	6.8	11.7	8.6	.3	.71
Introvertive Anhedonia	5.3	3.6	7.4	4.7	4.3	0.6	2.2	.12
Sense of Coherence	145.7	22.8	143.5	17.3	163.7	11.0	1.3	.28
Australian Sheep-Goat Scale	28.3	4.8	27.9	5.0	30.3	5.0	.3	.72

[a] df = 2, 61

Table 2: Frequencies of participants in different Ganzfeld outcome groups who answered yes and no regarding current involvement in meditation and professional help seeking due to their paranormal experiences, and exact Pearson chi-square results

Ganzfeld outcome group	Meditation		Help-Seeking	
	yes	*no*	*yes*	*no*
No hits	15	22	0	37
One hit	15	9	2	22
Two hits	2	1	0	3
Test statistic [a]	$\chi^2 = 3.2$		$\chi^2 = 3.4$	
	$p = .33$		$p = .23$	

[a] Exact Pearson chi-square result ($df = 2$)

Discussion

To learn more about people who can obtain psi hits in the laboratory, it is important to reduce the mean chance expectation for hits for every individual. This was done here but the Ganzfeld outcome group that scored two hits only consisted of three individuals. Overall, none of the Ganzfeld outcome groups in this study differed on any of the participant variables. However, one problem with the interpretation of the results was the different group sizes. Even though the two hits outcome group was so small, the pattern of results regarding the questionnaires is interesting, since in this group the probability for an individual to have two correctly identified targets is 6.25%, instead of the usual 25%. Thus, if there was psi in any of the participant sub-groups, this group is the best candidate. I expected to find the largest differences between the no hit and two hits groups since they are the two extremes. This was not the case here. The largest (but non-significant) differences were instead found between the one hit and the two hits groups, see Table 1. The two hits group had a higher level of paranormal beliefs and experiences and extraversion. On the health-related variables, the two hits group had a lower level of all three factors of schizotypy and neuroticism together with a higher level of sense of coherence.

Moreover, none of the individuals of the two hits group reported seeking help because of their paranormal experiences whereas two individuals had done that in the one hit group. This pattern of results points towards the possibility that earlier studies concerned with "receiver" variables might have found significant differences between a hit group and a miss group because the hit group was a mixture of chance hits and psi hits. For example, the finding that positive symptoms of schizotypy predict hits (Lawrence & Woodley, 1998; Parker, 2000) might instead be interpreted as positive symptoms of schizotypy predict chance hits. The small two hits outcome group here had a lower level of positive symptoms of schizotypy compared with the one hit outcome group but still had a higher level of paranormal beliefs and experiences. Although positive symptoms of schizotypy and paranormal beliefs and experiences show significant correlations, they are far from perfect. For example, a previous study showed a moderate correlation between the O-LIFE Unusual Experiences factor and the Australian Sheep-Goat Scale (r = .45; Goulding, 2004). In order to get a better understanding of what the overlap consists of, item analyses are needed. This information might also

provide some answers to why positive symptoms of schizotypy might predict chance scores, if indeed this is the case.

Since the two hits outcome group was so small it was not possible to draw any conclusions from the statistical tests of the hypotheses. In order to investigate the possibility that people who score hits by chance contribute to significant differences found so far between hitters and missers, it is important to collect psi data in such a way that hit scoring due to chance is reduced. However, as was seen here, it might be impossible to collect enough data in one study to form a reduced chance hit group that is not too small. Consequently, researchers might need to cooperate and pool their reduced chance hitters from different studies and then compare them with other outcome groups on different variables.

The results, albeit limited to very few individuals, do raise an interesting hypothesis that if some people are successful in psi experiments due to psi "ability", then these people are closer to the psychological health endpoint of the health/ill-health continuum than to the ill-health endpoint.

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Research Note: Sleeping With the Entity – A Quantitative Magnetic Investigation of an English Castle's Reputedly 'Haunted' Bedroom.

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Abstract

Field-based investigations of haunt-phenomena have revealed that magnetically remarkable signatures may exist in specific locations associated with strange experiences. However, no field-study to date has carried out a detailed assessment of both magnetic frequency and amplitude components present in such environments. In the present study, we carried out a follow-up investigation that further examined a recently documented magnetic anomaly from a reputedly haunted English castle. We report the first field-based investigation of amplitude and frequency-based (FFT) analyses of a magnetically remarkable microenvironment associated with repeated instances of striking anomalous experiences. Both the existence of a large static inhomogeneous magnetic field and complex temporal distortions in the time-varying (AC) magnetic fields were measured. Implications for anomalous perceptions are discussed.

Introduction

Recent research suggests that locations associated with repeated instances of haunt-type experiences may contain magnetically remarkable

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signatures (Braithwaite, 2004; Braithwaite, Perez-Aquino, & Townsend, in press; Wiseman, Watt, Greening, Stevens, & O'Keeffe, 2002; Wiseman, Watt, Stevens, Greening, & O'Keeffe, 2003; see Persinger & Koren, 2001). Under certain circumstances these locations may influence specific neural/experiential processes in certain individuals. The net result of exposure to such fields could be that observers may subsequently bias their impressions of ambiguous stimuli towards a paranormal interpretation within a particular 'magnetic context' (see Houran, 2000; Lange & Houran, 2001, 1997[1]), or indeed such fields may induce more elaborate forms of direct sensory hallucination (see Persinger & Koren, 2001).

However, despite the useful nature of these studies it is still somewhat unclear as to what is both necessary and sufficient for a magnetic environment to contain experience-inducing characteristics within certain contexts. This is particularly the case in terms of detailed time-varying and frequency-based components of magnetic signatures. If we accept the general working hypothesis that magnetic signatures can be crucial, then we need to start asking more detailed questions about the signatures and contexts themselves. One possibility is that what is both necessary and sufficient for a particular magnetic field to exert an influence in one context, is the same for most other contexts. Alternatively, it could be that these factors vary dependent on other context-dependent contributions present at that time (either related to the individual or the environment). Irrespective of the possibilities, assessing the magnetic microenvironment is now a task of major importance for the field-based investigation of a reputed haunting.

The present study

We returned to investigate a reputedly haunted English Castle. The location was Muncaster Castle situated on the west-coast of the lake-district (see Braithwaite, 2004; Braithwaite et al, in press). In previous studies we have shown that areas associated with striking haunt-type reports, were also distinguishable along magnetic dimensions – with crucial areas showing much increased variability. One area of importance identified for both eyewitness accounts and magnetic anomalies

[1]We acknowledge that magnetic fields themselves are not the only variable with the potential to influence perceptions in observers. Many other physical dimensions and contextual factors may contribute and even predominate in certain cases. Nevertheless, striking experiences do seem to be associated with magnetic signatures and we concentrate on this component here.

is the Tapestry room bed (see Table 1 for a summary of the most striking reports). However, previous investigations were unable to assess how the magnetic variability was being shared across complex time-varying sources, localised static DC sources, or interactions between the two. The purpose of this return visit was to initially assess in more detail (i) the nature of the static distortions, (ii) the nature of the time-varying amplitude and frequency components, and (iii) basic interactions between static and time-varying components.

Table 1: A summary of some of the main experiential components reported by Tapestry-room bed occupants

Content of experience / reports from some occupants of the Tapestry room bed
Sounds of children crying / screaming
Sounds of adult voices
Feelings of a sensed presence / being watched
Fleeting visual shadows / apparitions
Hearing footsteps – bangs and raps
Bouts of ringing in the ears
Severe headaches / migraine
Being touched in the night
Bouts of dizziness
Periodic feelings of severe foreboding
Feelings of a weight on the chest / body pressing down

Method

Design & procedure

The study was carried out at Muncaster Castle, Ravenglass in West-Cumbria on the evening of Tuesday the 26th October, 2004, between 7:00pm and 11:30pm. We carried out a preliminary magnetic survey of the Tapestry room (TR) bed using a Silva navigational compass, which was repeatedly passed over and around the bed area. This was then followed up by taking a series of precise measurements using the Magnetic Anomaly Detection System (MADS) which employs two separate digital fluxgate magnetometers interfaced directly to laptop computers. To do this we divided the bed up into 3 discrete reference points placed along a central dividing line. These were (i) the pillow area, (ii) the middle of the bed, (iii) the foot of the bed. One sensor (Sensor A) was placed on the pillow and remained there for the whole experiment. The

other sensor (Sensor B) was moved to the different bed reference points and produced a series of time-linked synchronised magnetic measurements from those locations. We also ran two separate baseline estimates which included (i) a condition measuring the pillow with all the lights turned off to assess how the nearby bedside lamps, and their demand on the AC power supply were contributing to the overall AC magnetic fields measured (no-lights), and (ii) a mid-room measurement which represents an area localised to the bed, but existing outside of any static anomaly (as determined by prior surveys and repeated here by the compass survey). The approximate mid-room point was located 3 – 4 m distance from the TR bed. Each location was measured for 10mins duration. All frequency-based and FFT analyses were carried out using Sigview signal analysis software (http://www.Sigview.com/).

Frequency-spectrum analysis (FFT/STFT) configuration

The time-varying components of the amplitudes measured were separated by applying Fourier Transforms to the data. We carried out two separate forms of Fourier Transform. Firstly, we applied a standard frequency-only Fast Fourier Transform (FFT) on complete 10 min sessions. This revealed how much of the magnetic energy was contained within what major frequency components (between DC – 125 Hz). Coupled to this we also carried out a Short-Term Fourier-Transform (STFT) based on a 'moving window' approach where peak amplitudes were measured at discrete temporal intervals through the signal. Furthermore, a Short-Term Fourier Transform analysis which provided a time – frequency and amplitude representation of the fields measured was also carried out. This showed not only what frequency components were present, but also when in time they occurred and to what magnitude.

Results

The compass test revealed a strong deflection in the magnetic field around the bed. The compass needle was being considerably deflected by the bed up to a distance of around 2 metres, this deflection being more than 90 degrees close to the iron mesh bed support itself. This indicates a strong localised static anomaly[2].

Results from the MADS bed-survey were as follows: Firstly, there were large differences between the overall static DC fields measured at

[2]The beds in nearby rooms showed no magnetic reaction at all when tested.

the three bed reference points. Overall mean amplitude levels are given in Table 2 along with their associated standard deviations (as an index of variability). Turning the lights off had only a minimal impact on the measured amplitudes indicating that they were not a crucial contributor to the background ambient magnetic environment in the bed area.

Table 2: Mean field strength (static amp) and standard deviation for each measuring session during the bed survey and baseline measurements. Note; low-load measurements were taken in the pillow region with all the room and bedside lamps turned off.

Sensor Location (A)	Static amp (nT)	Std-dev	Sensor Location (B)	Static amp (nT)	Std-dev
Pillow area	23,144	24	Bed centre	93,013	61
Pillow area	23,145	24	Bed foot	57,202	109
Pillow area (no lights)	23,143	24	N / A	-	-
Mid-room	74,021	22	N / A	-	-

Standard FFT

A visual examination of the fields measured was carried out to reveal any peaks, transient AC events, DC shifts, or any time-based variability within the data series (see Figure 1). After inspection (which did reveal some anomalies – reported below) we applied a FFT to the 10min data series on the Total combined ($\sqrt{x^2 + y^2 + z^2}$) data for every sensor location. The predominant AC component (Figure 1) across all locations surveyed was found to be primarily a 50 Hz waveform (UK mains-frequency), when confirmed using a FFT (Figure 2). Note, there is a difference in amplitudes between the raw AC variability and that shown in the FFT peak. This is because not all the energy is exactly 50 Hz, at all times. Due to an odd modulation effect (discussed below and shown in Figure 4) this often caused instances of frequency spreading around the base of the peak (e.g., estimates of 48 Hz – 52 Hz).

As the measurements were taken within a living environment that had electrical wiring the presence of a 50 Hz peak is not surprising and should be an expected contribution to some degree. The 50 Hz averages for the whole measuring session at each location, along with their associated standard deviations are shown in Table 3.

Short-Term FT (STFT) analysis

We compared the variability at the various bed-reference locations to the respective time-linked matched baseline measurements. Firstly,

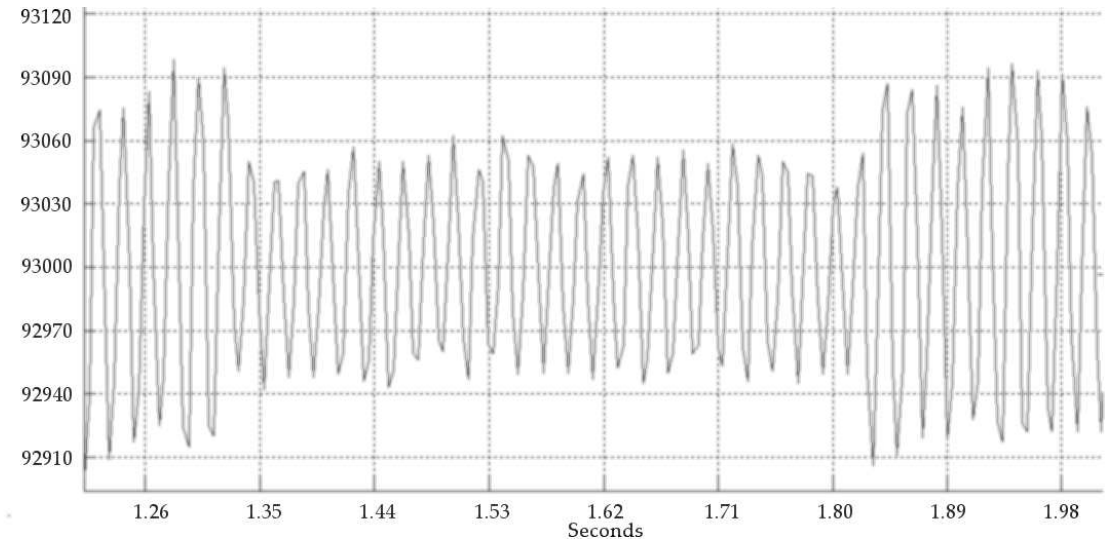

Figure 1. An example of the raw waveform magnetic time-series data measured at 250 samples a second by Sensor A (bed centre session). This specific illustration shows an 'inverted pulse' instance. The clear difference between the pulse and the general background variability can be easily seen (values given in nT).

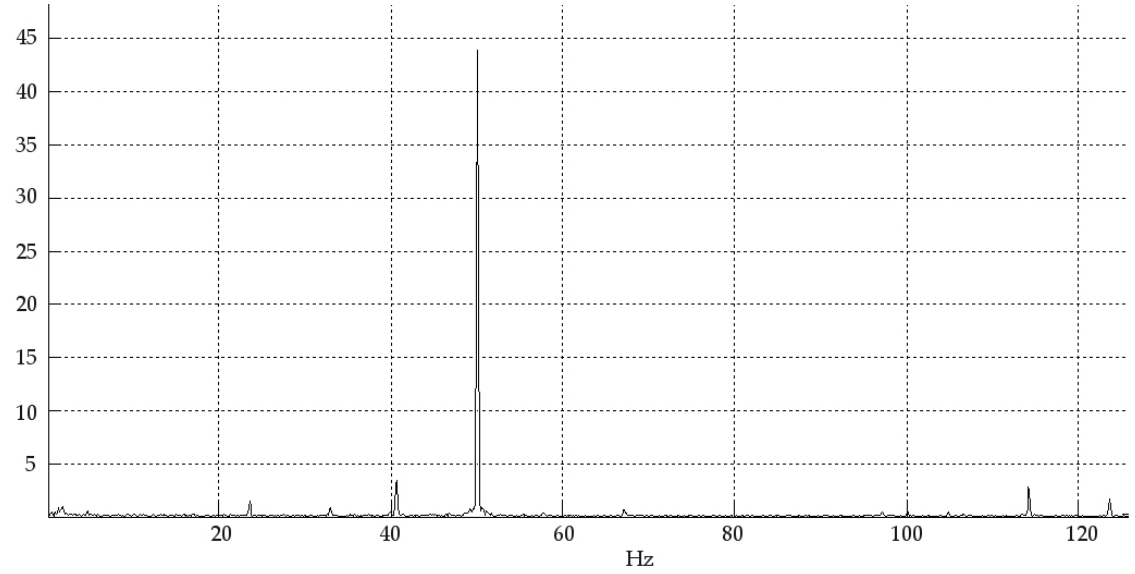

Figure 2. An example of the time-series magnetic data converted into the frequency domain via an FFT applied to the data series (from the first 8 seconds of the bed centre session). The frequency spectrum between DC –125Hz is shown. Here a clear 50Hz peak of approximately 44nT can be seen. This represents the contribution from artificial man-made wiring to the background fields measured. This figure shows how much magnetic energy is contained within what frequency components.

Table 3: Total average 50Hz frequency amplitudes measured via the FFT procedure for each sensor location. All values are given in nT.

Sensor Location (A)	50Hz amp (nT)	Std-dev	Sensor Location (B)	50Hz amp (nT)	Std-dev
Pillow area	15.1	1.2	Bed centre	39.1	3.1
Pillow area	15.4	1.2	Bed foot	26.1	9.3
Pillow area (low-load)	15.9	0.7	N / A	-	-
Mid-room	9.9	1.4	N / A	-	-

we computed a moving-window STFT on the combined values and moved through each signal in steps of 30 seconds (approx 7500 samples[3]) to create a series of 'amplitude bins' (note these amplitudes only refer to the energy contained within the 50 Hz frequency spike). At every 30 sec bin, we recorded the peak 50 Hz amplitude measurement (in nT). Each sensor run for each location produced 20 amplitude bins. We then compared and analysed the differences between the locations by calculating the variance for each data set and dividing these into each other to produce an F-Max value (a derivative of the F-ratio when unequal variances are suspected: Keppel, Saufley & Tokunaga, 1992), which is then compared to an adjusted P-value. This revealed the following results. The variability measured in the bed-centre was significantly more increased relative to the time-linked measurements from the pillow-area, $F_{adj(19,19)} = 6.67$, $p < .01$. The bed-foot was also significantly more variable than time-linked measurements from the pillow-area, $F_{adj(19,19)} = 60.10$, $p < .001$. We also compared the "no-lights" pillow measurement against the average of the two pillow sessions that had the lights on. Although there was a trend for a marginal reduction in variability, this difference was not significant, $F_{adj(19,19)} = 2.94$, $p > .025$. Finally, we averaged the variability for all three bed-grid positions (as a general representation for variability in that area) and compared this to the mid-room baseline location. The variability in the bed region was significantly increased relative to the mid-room baseline area, $F_{adj(19,19)} = 16.8$, $p < .001$.

[3]Due to concerns from an 8 second modulation effect we repeated the above analysis with a moving window restricted to 8 seconds bins that moved in phase with the effect. This meant that in most cases each 8 second bin contained data that was, as much as possible, stationary within itself. Although the size of the effects altered slightly, the relative difference between the results remained unaltered.

Visual Analysis of 'inverted-pulse' events

Moving through the signals, the visual analysis revealed what appeared to be a number of 'inverted pulses' (see Figure 1, for a typical example). These pulses were present at all locations surveyed, and occurred throughout the measuring period (though they varied considerably in amplitude at different locations). In all cases the pulses displayed the same characteristics, consisting of a sudden, large drop in the AC field component, returning to its previous value. The average pulse duration was approximately 480 ms for all locations. The pulses appeared at the same time in the matched data files from both locations in each synchronised pair. Therefore, whatever was causing the pulses, its influence was affecting all the locations measured. The waveform frequency during the pulse remained at 50 Hz, the same as the AC waveform surrounding it. It was also immediately apparent that the pulses occurred at intervals that were integer multiples of approximately 8 seconds.

In Figure 3 the frequency of each multiple of 8secs gap is plotted. The leftmost column is the number of 8sec gaps (the most frequent), followed by 16sec gaps, then 24sec etc.

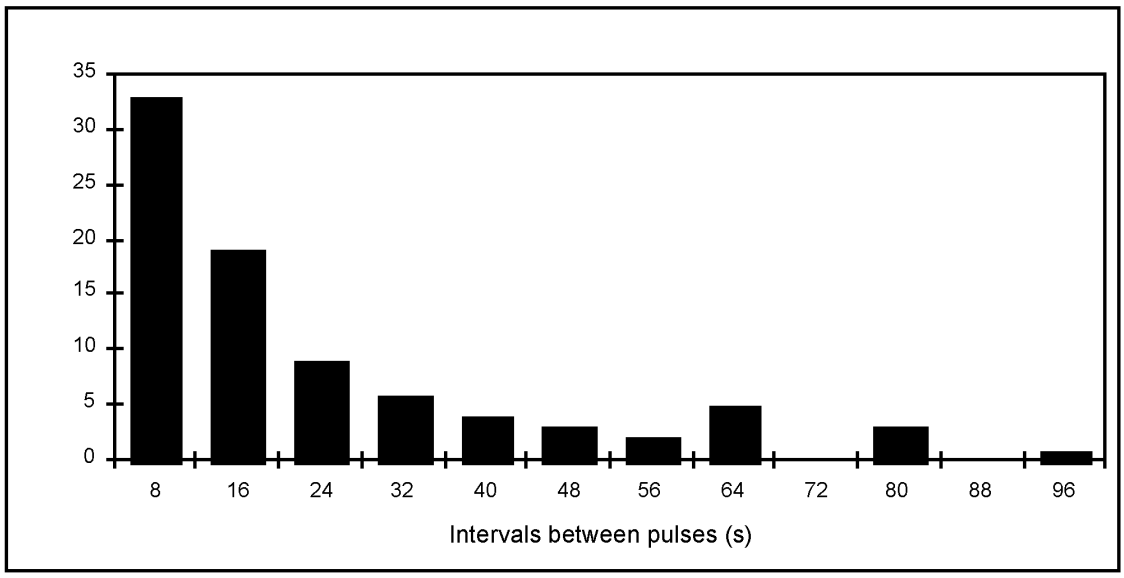

Figure 3. A frequency-plot of each multiple of 8 secs gap. The leftmost column is the number of 8 sec gaps between pulses (the most frequent), followed by 16 sec gaps, then 24 sec etc.

The degree of change between the AC pre-pulse and AC during-pulse amplitude differences were also calculated. The change in amplitude during the pulse (the 'pulse depth') is defined here as the average

AC amplitude over the 500 ms preceding the pulse minus the average amplitude during the pulse. The pulse depth is important because it represents a sudden change in the energy contained within the overall 50 Hz field. Table 4 shows the average amplitudes before and during the pulses, as well as the depth (i.e., difference), for each pulse.

Table 4: Amplitude inverted-pulse characteristics measured by both sensors at the same time. These values (nT) represent average amplitudes collapsed across all pulse instances

Sensor Location (A)	Pre-pulse amp	During-pulse amp	Pulse 'depth'	Sensor Location (B)	Pre-pulse amp	During-pulse amp	Pulse 'depth'
Pillow area	20	7	13	Bed centre	76	45	31
Pillow area	30	15	15	Bed foot	71	49	22
Pillow area	30	14	16	Mid-room	25	14	11

Table 4 shows that the highest AC fields, occurred at the bed foot and bed centre locations. These same areas also saw the largest pulse 'depth'. On occasion pulses easily exceeded 40 nT. This suggests that these areas may well be closer to the source of the pulse effect, since the depth of the pulse should increase with increasing proximity to the source. It is clear that apparent depth varies in proportion to overall AC amplitude.

Time-based STFT:

Consistent with the moving-window STFT analysis reported above, we also carried out a time-STFT plot on the data series which reveals more vividly that the energy contained within the 50Hz peak was not constant, but varying over time . The example given in Figure 4 shows a segment from a measuring period taken from the bed-centre location. The 50 Hz peak that makes up the principal component and general waveform can clearly be seen as an obvious ridge in amplitude. In addition, as one traces the ridge across time, four large amplitude drops or 'notches' can be seen. Furthermore, in phase with these notches the 50 Hz peak did display some minor frequency-spreading and distortion at the base of the peak. The illustrated segment represents pulses that seemed to display an 8 second interval pattern. The overall duration represented in Figure 4 is approx 30 seconds worth of data.

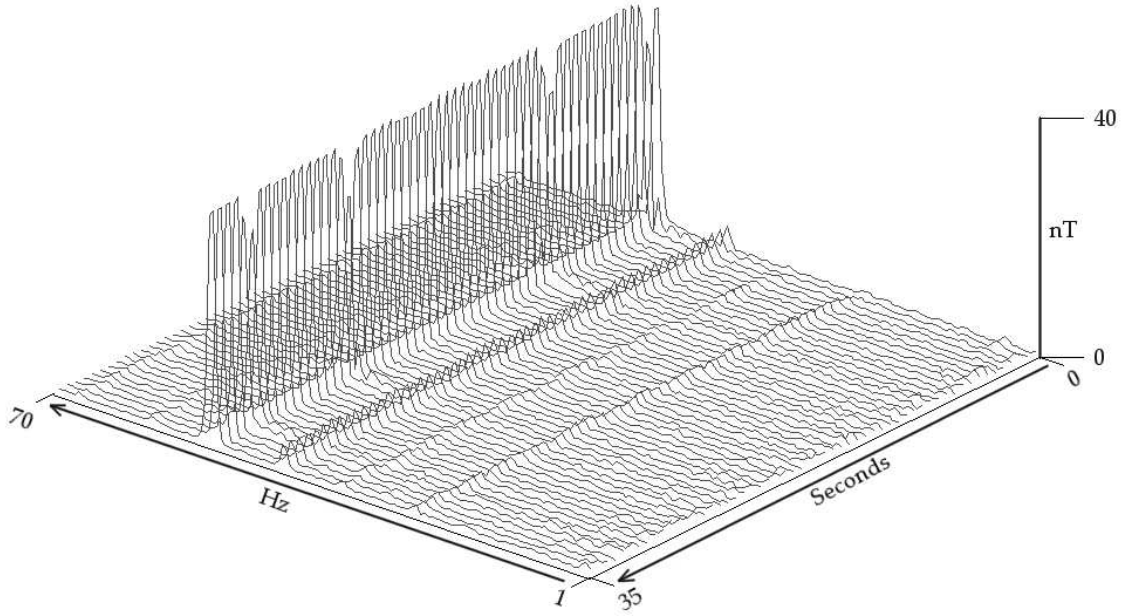

Figure 4. Data from an STFT showing a time-frequency representation of the magnetic fields measured. Frequency is represented along the x-axis (1 – 70 Hz) and shows a clear large ridge or peak at 50 Hz. Time is represented along the y-axis (0 – 36 sec) and amplitude is represented along the z-axis (max 40 nT). As can be seen the 50 Hz field is present throughout the measuring period. However, now plotted over time, a number of inverted pulses in the amplitude can also be seen. This procedure reveals not only what frequencies are present, but also how long they are present for (continuous or sporadic) and displays any temporal discontinuities in the magnitudes of the fields present (as can be seen in the 50 Hz ridge over time).

Discussion

We returned to an English castle to investigate both the static and time-varying (frequency) components of a particular magnetic anomaly previously implicated in a reputed case of a haunting. The present findings extend prior measurement studies by including here an evaluation of both the natural magnetic and the spectral components present during the measurement period. The nature of this anomaly and its experience-inducing potential are briefly discussed below.

Static magnetic field distortions

The largest contribution to the localised anomaly is clearly a static field. This static ambient magnetic field is distorted in a major way (see Table 2). The largest distortion found was over 70,000 nT, implying that the metal mesh may well be magnetised and not just highly permeable. The large static field variability between the bed areas surveyed and the rest of the room will result in high magnetic gradients around and

across the TR bed. If an occupant of the TR bed were to move their head frequently in such a steep magnetic gradient it could potentially induce highly variant magnetic distortions around their skulls. The distance from the pillow and the centre of the bed is around 1 m. Based on estimations from the present data, there is an implied gradient of at least 70 nT/mm. Thus, relatively modest movements in either the head of someone on the bed or of the metal mesh itself would easily expose the head to changes well in excess of 100 nT.

Varying Magnetic Fields

The main contribution to the ambient AC field is overwhelmingly coming from a 50 Hz power-frequency source. In contrast to the static anomaly, the AC contributions to the general TR area are low – on average being less than, 30 nT. However, the level of this amplitude was varying considerably over time. One possibility for the pulses in amplitude could be phase modulation. Interestingly, the castle employs a 3-phase power system in which the phases are separated by 120 degrees. The presence of a 3-phase system certainly increases the likelihood that the modulation effect could indeed be due to separate 50 Hz magnetic contributions that are out of phase with each other. For phase modulation to *reduce* an ambient field of the same frequency, it would need to be out of phase by over 120 degrees. This possibility requires further examination.

There are no discernable patterns to the gaps between pulses though clearly the shortest intervals (8 seconds) are the most frequent (Figure 3). The relationship between gap frequency and interval is striking. The largest pulse depths are around the foot and centre of the bed (Table 4), implying that the source is physically nearer to those areas.

In terms of haunt-type experiences, the pulses are interesting because of their very low-frequency (up to 0.125 Hz) and amplitude (the largest drop recorded was over 40 nT). For instance, other research has suggested that low-frequency signatures (in the region of the brain activity from 0.5 – 40 Hz) are particularly potent for encouraging neurophysiological shifts and experiential changes in individuals (Bell, Marino, & Chesson, 1992; 1994; Randall & Randall, 1991; see Persinger & Koren, 2001). Such a low-frequency is also well within the same range of natural geologically defined fields which have also been suspected in some anomalous reports (Persinger, Ludwig & Ossenkopp, 1973; see Persinger & Koren, 2001; Roll & Persinger, 2001). Furthermore, mag-

netic field variability as low as around 11 nT – 15 nT has been associated with increased strange perceptions reported in some field studies (Wiseman et al, 2003; Stevens, personal communication). The magnetic variability contained simply with the 50 Hz component here is well in excess of those suggested estimates (irrespective of the variability coming from the static anomaly of the bed itself).

Though the pulses are created out of a 50 Hz field (which is not a complex field) it would be 'seen' by a DC magnetometer, and by a human brain, as a pulse in the static field. Importantly, the non-homogeneous nature of these pulses, varying in time and magnitude do share some similarity to the artificial signatures employed in laboratory studies. The natural and spontaneous characteristics of a specific area (the TR bed) are associated with field signatures very similar to those associated with physiological changes (Persinger & Koren, 2001) and experiential reports (Wiseman et al. 2002, 2003).

How could these anomalies underlie the haunt reports?

Occupants of the TR bed are clearly immersed in a strong, static, spatially inhomogeneous and a temporally variable complex magnetic field. The variability of the fields would be greatly exaggerated by movement within the bed. The distortion in the static field caused by the magnetic bed support occurs independently of and is in no way related to the electrification of the castle. Individual movement by bed occupants would induce vast time-variant and complex changes in the fields directly surrounding the individual. Therefore, time-varying changes can occur here in the complete absence of any electrical supply or equipment and, as such, does not need a power source in order to produce significant distortions.

Secondly, on top of this, additional low-frequency AC ripples in the base 50 Hz field also add further temporal complexities to the magnetic signatures available. Indeed, even what should be the most basic magnetic field (a 50 Hz component) is far from displaying simple properties. The fact that these anomalies are most prominent in an area where occupants spend some time before reporting experiences is in line with the suggestion that such fields are associated with striking reports of anomalous experiences. The nature and amplitude of this distortion are similar to those reported from both other laboratory studies and field-based investigations of haunt-type reports. Although many factors may contribute to different instances reported from the TR (both individually

and environmentally) the excessive nature of the magnetic distortion in that precise region may not be a coincidence.

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Research Note: Creative Personality and Belief in the Paranormal

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Abstract

Eight studies were identified as containing correlations between creative personality and belief in the paranormal. Fifteen analyses were uncovered, all positive and all but two significant. The median correlation was a moderate .345. It was therefore concluded that sheep tend to have a more highly creative personality than do goats.

Introduction

One of the many variables that might be supposed to be related to paranormal belief is creative personality. Creative personality consists of various personality characteristics which, to quote Davis, Peterson, and Farley (1974, p. 33), "...regularly haunt the literature describing the creative person". In fact, a number of studies have examined the relationship between paranormal belief and creative personality. It is the purpose of this paper (1) to describe the earlier of these studies; (2) describe in some detail the Creative Personality Scale, since it was much used in later studies; (3) describe the measure of belief in the paranormal used in all these studies but one; (4) list in a table all available studies of paranormal belief and creative personality, and tabulate the correlation published (or calculated through re-analysis); (5) work out the overall median correlation as the best estimate of the correlation in the population; and (6) discuss the results.

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The early studies

The earliest study was apparently the one by Joesting and Joesting (1969): a minimally described sheep-goat scale correlated positively and significantly with the Torrance Creative Motivation Inventory (Torrance, 1963).

Davis et al (1974) compiled a 7-item Belief in Psychical Phenomena Test and correlated it with two attitude/motivation type instruments, both developed by Torrance (1971): the 50-item *What Kind of Person are You? (WKPAY?)*, and the 30-item *Personal-Social Motivation Inventory (PSMI).* The authors also had access to actual ratings of creativity. They analyzed each sex separately, and found two out of three correlations were significantly positive in each case, the Personal-Social Motivation Inventory common to both sets of results.

Moon (1975), using a three-alternative question, found that visual arts students showed significantly higher belief in ESP than did students in other disciplines.

There was then a gap of 19 years when no more research of this kind was reported.

The Creative Personality Scale

Research resumed in the 1990s, all of it using a specially constructed scale to measure creative personality: it consisted of nine true-false items, five of which came from the Torrance Creative Motivation Inventory (Torrance, 1971, pp. 95-96) and four of which were constructed specifically for the scale. The items may be found in the Appendix to Thalbourne (2000). The resulting scale, which was first devised by Thalbourne and Delin (1994), had an internal reliability coefficient (Cronbach alpha) of .62. As to the validity of the scale, two semi-formal studies have been conducted:

All questionnaire participants arriving in a given time period at the author's office for verbal feedback (N = 28) were asked (in advance of consulting their scores for creative personality) whether in the past year or 2 they had engaged in "significant creative activities." Answers included drawing, poetry, drama, music, other literature, other categories (such as painting, decorating, and crafts), and the total number of activities was calculated. No attempt was made to verify these reports. Nevertheless, creative personality correlated significantly with total number of creative activities (τ corrected for ties = .32, p = .02, two-tailed), with

drama (τ = .36, p = .007), with drawing (τ = .34, p = .01) and with poetry (τ = .27, p = .04). The creative personality scale can thus be said to have received at least partial validation (Thalbourne, 1998, p. 405).

A similar procedure was followed using 50 participants in a later study (Thalbourne, 2000). The writing of poetry showed a significant positive correlation with the Creative Personality Scale (Kendall's τ = .25, corrected for ties, p = .01). The writing of other literature, such as novels and short-story writing, showed a marginally significant correlation: τ = .19, p = .07. Thus the conclusion from both studies is that there is some evidence of construct validity.

The Rasch Australian Sheep-Goat Scale

Note that in the studies using the Creative Personality Scale, the measure of the paranormal belief variable was originally the 18-item visual analogue Australian Sheep-Goat Scale (Thalbourne & Delin, 1993). However, Lange and Thalbourne (2002) derived a 16-item Rasch Australian Sheep-Goat Scale, which was here used in all cases except for Thalbourne, Bartemucci, Delin, Fox and Nofi (1997). Rasch scaling involves the process of "top-down purification" in which items biased for gender and/or age are eliminated, the scale is checked for unidimensionality, and the result is a scale with good reliability and an interval-level measure. The two items that were rejected were the ones on afterlife issues.

Results

Including the early work, a total of 8 relevant studies, containing 15 distinct analyses, were located. Except for one case (Moon, 1975), Pearson's correlation coefficient was calculated for the measure of belief in the paranormal and the given measure of creative personality. Table 1 contains these correlational data.

The Pearson correlations range from .03 to .47. Thus all the analyses are in the positive direction. All but two are significant. It was deemed that the best measure of central tendency for this set of correlations was the median, since it is less affected by extreme correlations. The median correlation is a moderate .345. There thus appears to be good evidence that believers in the paranormal are more likely to display signs of creative personality and indeed, some evidence of creativity itself.

Table 1: Pearson correlations between creative personality and various measures of belief in the paranormal.

			Creative Personality Scale	
Study	Sample	N	r	p
Joesting & Joesting (1969)	Students	53	.45	.01
Davis, Peterson & Farley (1974)				
WKPAY?	*Male students*	36	.25	n.s.
PSMI			.34	$< .05$
Creativity ratings			.47	$< .01$
WKPAY?	*Female students*	101	.27	$< .01$
PSMI			.26	$< .01$
Creativity ratings			.03	n.s.
Moon (1975)	Students	458	[a]	$< .001$
Thalbourne & Delin (1994)	Students	241	.38	$< .001$
Thalbourne & Delin (1994)	Manic-depressives	86	.35	$< .001$
Thalbourne & Delin (1994)	Schizophrenics	38	.43	.010
Thalbourne & Delin (1995)	Students	123	.42	.001
Thalbourne, Bartemucci,	Students/			
Delin, Fox & Nofi (1997)	General public	370	.37	$< .001$
Thalbourne (1998)	Students	242	.30	$< .001$
Thalbourne, Keogh & Crawley (1999)	Students	248	.32	$< .001$

[a] Chi-square (df = 2) = 22.13.

Discussion

Two issues arise for discussion. The first is that, like the sheep-goat variable itself, creative personality and creativity may each be predictive of psi scoring. There are a number of statements which assert this relationship (e.g., Angoff & Shapin, 1970; Murphy, 1963), and some experimental evidence bears this out (e.g., Schlitz & Honorton, 1992).

The second issue is more sobering, and that is that creative personality is correlated not only with the sheep-goat variable but also with indices of ostensible psychopathology. In most of the Thalbourne studies creative personality is moderately to highly correlated with magical ideation (Eckblad & Chapman, 1983: an index of schizotypy) and also significantly correlated with the Rasch Manic-Depressiveness Scale (Lange, Thalbourne, Houran & Lester, 2002), both of which *prima facie* suggest that persons higher in creativity may be more prone to psychosis. One way of testing this possibility is to correlate the Creative Personality Scale with the variable Neuroticism (Eysenck & Eysenck, 1991), which is a measure of proneness to psychiatric symptoms, located

in both Thalbourne (1998) and Thalbourne, Keogh and Crawley (1999). The result was that in neither study was the Creative Personality Scale significantly correlated with Neuroticism. Thus, high scorers on the Creative Personality Scale do not necessarily tend towards neuroticism. The observed correlations between creative personality and magical ideation and manic-depressiveness suggest instead a non-pathological personality type analogous to "the happy schizotype", "who is functional despite, or even because of, his or her anomalous experiences" (McCreery & Claridge, 1995, p. 142). This model is being increasingly invoked in the psychology of belief in the paranormal. However, it should also be pointed out, as did Brugger and Taylor (2003, p. 229), that there are significant relationships between creativity, schizotypy and right hemisphere language processing, and a feature of schizotypy is reported belief in, and experience of, the paranormal (Thalbourne, 2003).

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Book Review

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A Review of "Twin Telepathy: The Psychic Connection", by Guy Lyon Playfair (2002)

My qualifications for writing this review are somewhat patchy. I have had a longstanding interest in the paranormal (I used to attend meetings of the SPR probably before most of the readers of this piece were born!); but over the years I have not really kept up much with the serious literature on the topic. My main research interest is in schizotypy – and therefore in studying some relevant personality traits – but magical ideation/psi belief forms only one small part of that broader clinical construct. And I once did a twin study and – as one always does with twins – chatted informally to my subjects about their 'telepathic relationship', but the scientific aim of the work was something quite different.

Perhaps all of the above adds up to a healthy scepticism, which is the spirit in which I approached this book. Its author, as one would expect, is more of an outright sheep, though there is nothing sheepish in the way in which he presents his subject matter. Writing with great enthusiasm, and in an admirably lucid style, Playfair tries to convince us that some twins – and here he is referring mostly to identical, or monozygotic, twins – definitely have telepathic powers. Although there appears to be a surprising dearth of studies on the topic, he presents, as far as one can tell, all of the naturalistic and experimental evidence that there is. For the open-minded and/or lay reader the most persuasive will be the anecdotal accounts, which include some quite remarkable

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examples of 'distant' communication between twins. Only the most insanely paranoid of critics could dismiss these as distorted recollection, make-believe, or downright cheating. Or so one might imagine. But that reckons without the vehemence that parapsychology seems to evoke among its antagonists, who are always ready to seize upon, as flaw, even the slightest departure from what they regard as the strictly scientific method.

Which articulates the central problem of paranormal research: trying to reformulate the phenomena of interest as rigorously testable, replicable experimental paradigms (the dilemma is not unique to parapsychology, incidentally. In a field I know better – schizophrenia research – many people rubbish the subjective report as invalid evidence, while I can't think of a single experimental paradigm that is truly replicable). Psi phenomena seem to occur best (if they occur at all) in situations that are not easily reducible to dull laboratory procedures: that is, in states of high affect, under conditions of spontaneity, or between pairs of individuals with a more than average degree of emotional closeness. According to these criteria twins should be the ideal people to study and of this Playfair certainly convinces us.

It is doubtful whether the author's focus on the twin evidence adds further to any *general* case for psi as a real phenomenon: for sure, his book is unlikely to convert any rabid goats. But I highly recommend it to healthy sceptics: apart from being a good read, it will definitely persuade some of them that if they are thinking of entering the psi fray then twins are the way to go.

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ERRATUM

In the paper by Harvey J. Irwin published in the EJP, Volume 18, 2003, "Reality Testing and the Formation of Paranormal Beliefs", the following footnote was omitted from page 15:

> "Acknowledgements: June Young, Shar Adams and Fiona Herrington are thanked for their assistance in recruiting the participants, and Joan Anderson is thanked for her assistance in processing responses on the reality testing questionnaire."