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Multiple Predictors of the Propensity for Anomalous
Hallucinatory Experiences

Jason T. Ramsay

A Thesis submitted to the Faculty of Graduate Studies and
Research in partial fulfilment of the requirements for the
degree of Master of Arts

Department of Psychology

Carleton University

September, 1994

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HALLUCINATORY EXPERIENCES

submitted by
Jason Theodore Ramsay, B.A.

in partial fulfilment of the requirements
for the degree of Master of Arts

A handwritten signature in cursive script, appearing to read "John Joz", written over a horizontal line.

Thesis Supervisor

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Chair, Department of Psychology

Carleton University

September, 1994

Abstract

This study established a phenomenology of anomalous experiences and discerned psychological factors which discriminated between those who reported anomalous experiences and those who did not. 110 participants completed psychological tests measuring hypnotizability, psychopathology, imagination, abuse history, propensity to experience alterations in perception and thought, sleep variables, and beliefs. Groups reporting anomalous experiences were significantly more likely to experience alterations in perception and thought. History of abuse did not discriminate individuals who reported anomalous experiences from those who did not. Belief in ghosts discriminated between controls and reporters of anomalous experiences. The anomalous experience group was divided into two groups based on the complexity of the anomalous experience, the high complexity group had increased propensities towards psychopathology and high degrees of imaginative involvement. The Low complexity group, on the other hand had relatively low scores on these measures, but relatively high scores on measures of alterations in perception and thought unrelated to psychopathology.

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Multiple Predictors of the Propensity for Anomalous Hallucinatory Experiences

Introduction

Have you ever, when believing yourself to be awake, had a vivid impression of seeing or being touched by a living being, or inanimate object, or of hearing a voice, which impression, so far as you could discover was not due to any physical cause?

Parish, 1897.

In 1894, the Society for Psychical Research, centred in London, England, undertook a "Census of Waking Hallucinations Among the Sane". As the title suggests, the reason for the survey was to determine the degree to which normal, average individuals were given to hallucination, particularly hallucinations that did not occur in a somnolent (i.e. dreaming) or "borderline" state between somnolence and wakefulness. The census was conducted in the European centres of Munich, London, and Paris, and was orchestrated on the American continent by William James. Of the 27,329 participants who responded 3217, or approximately 12%, reported experiencing an hallucination, either when "wakeful" ("out and away" from the bedroom) or "borderline" (awake but fresh from sleep, and still lying in bed). Parish (1897) summarized this census in his book "Hallucinations and Illusions: Fallacies of Perception".

Participants aged 20-29 reported the highest frequency of hallucinations. Hallucinations which occurred in the visual sense were most frequent, followed by auditory hallucinations. Hallucinations that involved "Realistic Phantasms", which suggests the labels "apparition" and "ghost" as synonyms, were more prevalent than other types of hallucinations including visions, angels, animals, lights, and inanimate objects. Sidgewick et al. (1894), who carried out the London portion of the study, reported that a significant minority of the cases took on a supernatural or paranormal cast. The realistic Phantasm category was subdivided into hallucinations of living persons, dead persons, unrecognizable persons, and incomplete or partially developed representations that included a figure of some sort. In the census, 611 hallucinations were reported as occurring while the respondent was fully awake. This number is almost twice that of the experiences reported as occurring in a borderline state (394). Although Parish (1897) used the results of the census as a template for a general theory of hallucination in normal individuals and those who give evidence of some form of psychopathology, no statistical research was carried out on the results of the census in order to lend quantitative empirical support to Parish's carefully reasoned theory. Research into the nature of anomalous hallucinatory experiences has, on the whole, not advanced a great deal beyond the theories and conclusions

drawn by Parish from the "Census of Waking Hallucinations Amongst the Sane". There are however, notable exceptions.

One recent survey, conducted by Spanos and Moretti (1988) found that out of 124 female university students, 37 (30%) reported one or more of three anomalous experiences (Out Of Body Experience "OBE", auditory hallucination of a spiritual/religious nature, visual hallucination of a spiritual/religious nature), 30 participants (27%) reported experiencing an OBE, 6 participants (4%) reported having heard a spiritual voice, and 9 participants (7%) reported experiencing a spiritual vision. Spanos, Cross, Dikson and DeBrueil (1994) found that reporters of UFO sightings and abductions by UFO-alien did not differ from a control group on measures of psychopathology and imagination. The most vivid reports however, were correlated with elevations in imagination and the tendency to engage in fantasy. Unfortunately, these results remained inconclusive due to the possibility of a pervasive response bias in the reporting group.

Although research into the nature of anomalous experiences is often domain specific, such as UFO-alien sightings, or religious visions, recent theorizing has stressed the similarities among anomalous experiences regardless of the interpretation given by the person reporting. Theories advanced to explain anomalous hallucinatory behaviour fall into two broad categories.

Endogenous theories see the hallucination as a function of brain physiology (Makarec & Persinger, 1985; Makarec & Persinger, 1987; Persinger, 1984; Persinger & Desano, 1986; Persinger & Valliant, 1985; Siegel, 1988). A second set of theories, which may be termed exogenous, stress the role played by social factors in determining the form and content (religious, alien or otherwise) of the hallucinatory experience (Spanos, Cross, Dickson & DeBreuil, 1994; Hood, Morris, & Watson, 1990; Sarbin, 1967; Sarbin & Juhasz, 1978; Spanos & Moretti, 1988). Exogenous and endogenous theories are complimentary and reflect differences in emphasis rather than disagreements concerning the causes of anomalous experiences. As well, theorizing about anomalous hallucinatory experiences has invariably differentiated between those experiences that are a result of psychopathology, and those experiences that arise in normal, sane individuals (Brierre de Boissement, 1853; Parish, 1897; Slade & Bentall, 1988). From Parish's (1897) time onward, there has been a great deal of theorizing about the nature of the anomalous hallucinatory experience but little empirical research to validate the theories that were developed to describe and analyze these experiences.

The inadequate level of empirical research in the field of anomalous hallucinatory experience belies the frequency with which they are reported (Ross, Joshi & Currie, 1990) and the degree to which they are represented

in the popular media. The aim of the present study was to extend the range of knowledge regarding anomalous experiences involving ghosts and religious deities. A phenomenology of anomalous experiences was established in order to foster the development of a framework for further investigations. Most importantly, individuals who reported anomalous experiences were examined along multiple dimensions including imagination, hypnotizability, history of abuse, and psychopathology. It was expected that specific variables would distinguish between individuals who had anomalous experiences and those who did not. In addition the group of participants who reported anomalous experiences was divided into two groups, one reflecting experiences with a relatively low intensity, and the other containing experiences judged to be of high intensity. This was accomplished on the basis of variables gleaned from a semi-structured interview of individuals reporting anomalous experiences. A set of dimensions was chosen and used to examine the similarities and difference among anomalous experiences and reporters of anomalous experience. The specific dimensions included the following: Imaginative involvement, temporal lobe lability, hypnotizability, psychopathology, and history of sexual abuse. The rationale for choosing these dimensions is based on trends reported in the literature dealing with anomalous hallucinatory experiences that is described below.

Imaginative Involvement

Spanos and Chaves (1989, p 47) defined imaginative involvement as the process of elaborating upon "make-believe" situations, while reinterpreting, or failing to reflect upon the information that contradicts the reality status of the make believe situation. In the context of the anomalous experience, however, the non-specific term "make-believe" needs clarification. Make believe in this case is synonymous with "illusory". Illusory experiences can take two forms: Misperceptions and hallucinations. Misperceptions typically have as their basis a stimulus present in objective reality which impinges on the senses whereas hallucinations do not. The misperception occurs because the stimulus is impoverished, or unaccompanied by the cues that aid the identification process. Misperceptions can lead to anomalous experiences if they occur in a certain setting, and if the perceiver (or misperciever) reifies the subjective; that is think that they have no part in the process of perception, that they see "what is out there". Due to the poverty of information afforded by the percept in this situation, the experient will elaborate on the ambiguity in order to form a complete whole. If the circumstances are right (i.e. late at night, in isolation, or in the presence of a priori beliefs about the supernatural) the experient can imbue the percept with qualities that it does not possess, thereby creating an

illusory or "make-believe" situation.

Similarly, hallucinations also involve the reification of the subjective, but in a different manner. Internal processes give rise to the hallucination and project it onto objective space. The same mechanisms that cause a misperception to be elaborated on and interpreted are also active in this case, producing essentially the same result. The only difference is that this "make believe" situation is created entirely in the absence of any stimulus from the individual's environment. Both types of illusion are found commonly in hypnagogic (sleep onset) and hypnopompic (sleep outset) experiences (Mavromatis, 1988).

There is evidence that imaginal factors predispose an individual to both types of make believe experiences. Measures of imaginative involvement include the Tellegen Absorption Scale (Tellegen & Atkinson, 1974), and the Inventory of Childhood Memories and Imaginings scale (ICMI) (Wilson & Barber, 1981). Absorption may be defined as the tendency to experience or engage in "reality altering" experiences that occur in everyday life. The ICMI measures the construct of fantasy proneness (Lynn & Rhue, 1986). Spanos and Moretti (1988) found that both mystical (positive, awe-filled religious experiences involving feelings of intense bliss and oneness with the environment) and diabolical (negative religious experiences involving demons or devils) experiences were positively correlated

with absorption. Several researchers have also demonstrated significant relationships between absorption and paranormal belief (Roche & McConkey, 1986; Atkinson, 1994). Similarly, Labelle, Dixon, Laurence, and Nadon (1990) found a relationship between absorption and reports of paranormal experience.

Another aspect of imaginative involvement is Fantasy Proneness, defined as a tendency to become highly engaged in imaginative experiences such as daydreaming, fantasy production, spontaneous creative expressions, and hypnosis. Lynn and Rhue (1986) estimated, based on college populations, that 4% of the population fit the category of "fantasy prone". Wilson and Barber (1983) noted that fantasy prone individuals were highly likely to report realistic Out of Body Experiences and encounters with ghosts or apparitions. Spanos et al. (1993) hypothesized that reporters of UFO abductions would fit the typology of the fantasy prone personality. Although intensity of experience and fantasy proneness were positively correlated in the group reporting highly intense UFO and UFO abduction experiences, Spanos et al. (1993) did not conclude from the data that the majority of those reporting UFO abductions were "fantasy prone", as few of the participants' scores were extremely high, and the majority did not reach the cutoff score established by Lynn and Rhue (1986) for the "fantasy prone personality" typology.

Clearly, imaginative involvement, as measured by the ICMI and the TAS is an important correlate of anomalous hallucinatory experiences. It was hypothesized that, overall, those reporting anomalous experiences would score significantly higher on measures of imaginative involvement than a control group.

Temporal Lobe Lability Theory: The PPI

Persinger and his colleagues proposed that anomalous experiences are a function of "temporal lobe lability", noting the similarity between reports of anomalous experiences in the general population, and the hallucinations and experiences often reported by temporal lobe epileptics (Makarec & Persinger, 1985). Siegel (1988; 1992) proposed a syndrome called "temporal lobe sensitivity" as the cause of hallucinatory experiences, religious or otherwise. The Personal Philosophy Inventory (PPI; Persinger, 1983) is a paper and pencil questionnaire composed of several subscales, including the temporal lobe-like signs subscale (XT). The XT scale includes questions regarding somatic disturbances (e.g., "Intense smells bother me more than most people."; "At least once a month, I experience intense smells that do not have an obvious source.") The XT subscale also contains items which tap propensity for fantasy ("Sometimes in the early morning hours between midnight and four, my experiences are very meaningful."; "I have had a vision.") Some of the items on

the XT scale evaluate physical sensations interacting with components of the imaginary (e.g., "While sitting quietly, I have had uplifting sensations as if I were driving quickly over a rolling road.") A number of items access religious experiences (e.g., "I have had a religious experience that I know was a real."; "After my religious conversion, I suddenly felt full of energy.")

Makarec and Persinger (1985) found positive correlations in a normal population between the number of responses that referred to paranormal experiences and to religious beliefs and the number of EEG spikes per minute from the temporal lobe. Spike quantity was also positively correlated with performance on the schizophrenia, psychasthenia, and hysteria subscales of the MMPI. Normal, mundane experiences were not correlated with averaged electrical temporal discharge, nor were paranormal experiences correlated with activity in a comparison region of the brain (occipital lobe). Based upon this evidence, Persinger and his associates concluded that the PPI was a valid inventory of temporal lobe lability.

In a replication, Makarec and Persinger (1990) found positive correlations ($r = .43 - .48$) between a sum of the hypothesized temporal lobe items of the PPI and the averaged evoked potential from the temporal, but not occipital lobes. These results were taken to support the construct validity of the XT scale of the PPI, and the hypothesis of a

continuum of temporal lobe sensitivity and variability within the normal population.

Persinger et al. (1985; 1987; 1990) maintained that fantasy proneness, as measured by the ICMI developed by Wilson and Barber (1983), paranormal experiences and hypnotizability are intercorrelated, and that this relationship is indicative of a continuum of temporal lobe activity. Support for this hypothesis came from Makarec and Persinger (1987), who reported significant correlations ($r = .50$) between the ICMI questionnaire and the XT scale of the PPI. There were also positive correlations reported between EEG measures taken from scalp electrodes placed over the temporal region and items from the ICMI. It was theorized that fantasy proneness was highly related to aberrant temporal lobe activity.

Spanos et al. (1993) hypothesized that UFO-alien sightings and abductions can be understood as fantasy productions, and consequently that Persinger et al.'s findings regarding temporal lobe sensitivity may be applicable to UFO-alien experiences. Spanos et al. divided the group that reported experiences that involving UFOs and UFO-alien into two distinct groups on the basis of scores on an intensity index. The non-intense group consisted of those who reported relatively simple experiences. An intensity index was constructed in which a score of zero reflected non-intense experiences, and a score of one or

higher (upward limit of seven) reflected intense experiences. The UFO-intense group consisted of UFO subjects whose experiences were more complex and engaging, and therefore scored 1 or higher on an intensity scale. In order to examine the hypothesis that UFO sightings and abductions could be understood as the product of temporal lobe sensitivity, Spanos et al. compared four different sample groups (UFO intense, UFO non intense, student control and community control). No significant differences between groups were found on the XT or paranormal belief scales of the PPI. The groups did differ significantly with regards to PPI questions which assessed UFO endorsement (e.g., "I would like to time travel."; "I have been taken aboard a spaceship."; Alien intelligence is probably responsible for UFOs."). The groups reporting UFO experiences, however, did score higher than the controls on the liberal beliefs subscale. There were no differences between the high and low intensity groups with regard to the subscales of Persinger's PPI. In general, Persinger et al.'s theory was not supported.

In light of these findings, it was hypothesized that groups reporting anomalous experiences would not differ significantly from a group of controls on the temporal lobe, paranormal experiences, and liberal beliefs submeasures of the PPI.

Hypnotizability

Several investigators have posited significant, positive relationships between paranormal beliefs, and paranormal experiences and hypnotizability (Pekala, Kumar & Marcano, 1992; Kumar, Pekala & Cummings, 1992). Recently, however, Atkinson (1994) found a significant, positive relationship between hypnotizability and belief in the supernatural, but no relationship between hypnotizability and reported paranormal experiences. Persinger and Desano, who utilized a measure of hypnotizability (Hypnotic Induction Procedure: HIP) developed by Spiegel and Spiegel (1978), found positive intercorrelations ($r=.4$ - $.6$) between hypnotizability, the PPI, and fantasy proneness. Temporal lobe signs were correlated with responses to paranormal experiences from the fantasy proneness and PPI inventories ($r=.44$), but not with hypnotizability. These results were interpreted as indicating that the temporal lobe scale assesses the tendency to engage in vivid fantasy, and that this is reflected in temporal lobe electrical profiles. Subjects who scored higher in the tendency to engage in vivid fantasy throughout their lives tended to score higher on the hypnotic suggestibility scale.

On the other hand, Spanos, Arango and de Groot (1993) found that the relationship between hypnotizability and the XT dimension was context dependent. These two variables correlated significantly when both were assessed in the same

context. However, when the two attributes were assessed as part of ostensibly different experiments, they failed to correlate significantly.

Hood (1973) found a significant correlation ($r=.36$) between a measure of hypnotic susceptibility and religious experience. Spanos and Moretti (1988) found that an inventory of mystical experience correlated significantly with a measure of imaginative involvement (absorption) ($r = .53$), and hypnotizability ($r = .36-.39$) (Carleton University Responsiveness to Suggestion Scale: CURSS). Intense negative religious or "diabolical" experiences, as indexed by the Diabolical Experiences Scale (e.g., "I have had an intimate encounter with an evil spirit or Satan which left me with a feeling of terror.") correlated significantly with both absorption ($r = .26$), hypnotizability ($r = .29 -.39$), and mysticism ($r = .39$). Furthermore, Wilson and Barber (1982) found that 75% of the highly hypnotizable women they surveyed reported an encounter with spiritual apparitions, and 85% reported having a realistic out-of-body experience. Diamond and Taft (1975) found a significant correlation between the Belief in the Supernatural subscale of Taft's Experience Questionnaire and hypnotizability. Nadon, Laurence and Perry (1987) found that the Belief in the Supernatural Subscale was a significant predictor of hypnotizability, and that the addition of the Belief in the Supernatural Subscale enhanced the correct discrimination

between medium and high hypnotizable subjects. Belief in the supernatural was indicative of high hypnotizability. Wagner and Ratzeburg (1987) found that hypnotizability was significantly correlated with reported psychic experience, church attendance, attitudes towards parapsychology and the occult (including the belief in UFOs), and a rigid belief in mystical determinants of one's future.

From these findings, it was hypothesized that reporters of anomalous experiences would score higher on a measure of hypnotizability, and that intensity of experience will correlate in a positive direction with hypnotizability.

Psychopathology and Anomalous Experiences

Investigators of UFO phenomena have hypothesized that UFO reporters manifest a discernible psychopathology (e.g., Klass, 1989). There is, however, little empirical support for this hypothesis, or for the counter hypothesis that UFO reporters do not manifest discernible differences in psychopathology as compared to non-reporting populations. Parnell (1988) found subjects claiming communication with UFO-alien to be more suspicious and distrustful, creative, and more likely to exhibit schizoid tendencies. UFO communicators were also more likely to endorse unusual feelings, thoughts and attitudes. Spanos et al. (1994) found that control subjects who did not report UFO experiences scored higher than UFO reporters on the MMPI schizophrenia subscale. Comparison groups scored higher than the UFO

groups on the Stress subscale of the Differential Personality Questionnaire (DPQ) (Tellegen, 1976). Members of the UFO groups scored significantly higher than the control group on the Rosenberg Self Esteem Scale. The UFO intense group scored higher in social potency than the other groups, and lower on the Aggression subscale of the DPQ. Thus, these results failed to replicate Parnell's (1988) findings, as well as countering the hypothesis that UFO sighters and contactees are suffering from a form of psychopathology (e.g. Klass, 1989).

Spanos et al. also found that members of the UFO-intense group were more likely to characterize the experience as negative. This parallels popular literature on UFOs such as magazines (e.g. UFO Universe) and books (e.g., "Communion" by Whitley Strieber, 1985) which have noted the difference between positive and negative alien encounters. Negative encounters generally involve temporary paralysis, being abducted against one's will, being subjected to medical examination while on the alien spaceship, and recurring somatic symptoms such as headaches and nausea upon return. Positive experiences on the other hand, involve meeting aliens, feeling that the meeting brings mutual enlightenment, and being entrusted with dire knowledge of humanity's impending destruction of the ecosystem or of earth in general by humanity. No recurring symptoms appear when the encounter is finished. There are, however,

stronger relationships between some forms of religious experience and psychopathology.

James (1892/1958) described a relationship between hyperreligiosity, the conversion experience and schizotypal-like behaviours, such as anhedonia. Feldman and Rust (1989) found religiosity was related to schizotypal thinking. Macdonald and Lockett (1983) noted correlations between religious affiliation and psychiatric diagnosis. Hood (1974) found that measures of intense religious experiences, characterized as "peak" or "ecstatic" were unrelated to measures of ego-strength and psychopathology. Spanos and Moretti (1988) found that an inventory of mystical experience correlated significantly with measures of imaginative involvement (absorption) ($r = .53$), and hypnotizability ($r = .36-.39$) but failed to correlate with indexes of psychopathology. Intense negative religious or "diabolical" experiences, as indexed by the Diabolical Experiences Scale (e.g., "I have had an intimate encounter with an evil spirit or Satan which left me with a feeling of terror.") correlated significantly with both absorption ($r = .26$), hypnotizability ($r = .29-.39$), and mysticism ($r = .39$), as well as indices of neuroticism ($r = .26$) and psychosomatic symptoms ($r = .24$). This distinction between negative and positive religious experiences was consistent with the factor analytic results of Margolis and Elfison (1979) who proposed a dichotomy of religious experience.

Margolis and Elfison differentiated between Vertiginous experiences, which involve visions or voices, initial negative reactions, loss of voluntary control of affect and physical movement, and Transcendental experiences, which included feelings of security, oneness and a noetic cast to reality.

Intense religious experiences characterized by hallucinations or delusions have been used to diagnose risk for schizophrenia. "Many of the positive symptoms associated with acute schizophrenia and schizotypal personality disorder, such as delusions and hallucinations, are expressed in religious form." (Smith, 1989; p 587). James (1902/1958) cited Ribot's concept of "anhedonia" as a symptom of intense religious experience leading to religious conversion. Both Spanos and Moretti (1988) and Margolis and Elfison (1979) distinguished between positive and negative religious experiences, the negative experience involving hallucinations, loss of voluntary muscular control, vertigo, and intense fear. These characteristics resemble those of brief psychotic episodes, or acute schizophrenic episodes. Neuroticism, psychosomatic symptoms and absorption were positively correlated with negative religious experiences (Spanos & Moretti, 1988). The positive/negative dichotomy of intense imaginal experiences is echoed in the construct of absorption (Tellegen & Atkinson, 1974). Recall that absorption may be defined as the tendency to experience or

engage in "reality altering" experiences that occur in everyday life. Both mystical and diabolical experiences correlated with absorption and hypnotizability (Spanos & Moretti, 1988). Recall that absorption is also positively correlated with paranormal experiences (Roche & McConkey, 1990).

It is clear that anomalous hallucinatory experiences are related to psychopathology, as in the case of schizophrenia. Nevertheless, in light of theoretical work on hallucinations derived from surveys (Parish, 1897; Slade & Bentall, 1988), it is clear that not only those diagnosed with schizophrenia are prone to hallucinations. Theories of hallucination (Brierre de Boismont, 1853; Parish, 1897; Slade & Bentall, 1988) stress that hallucinations can arise in normal individuals as well as those with an underlying psychopathology. Thus it was predicted that only high intensity anomalous experiences would positively correlate with measures of psychopathology.

Physical and Sexual Abuse

Several studies have demonstrated links between a history of traumatic experiences, specifically, emotional, sexual and physical abuse, and anomalous experiences (Ross, 1989; Ross et al. 1989a; 1989b; 1990a; 1990b; 1990c; McNulty, 1994). Ross et al. found links between a history of childhood trauma and dissociative experiences and syndromes. It was theorized that paranormal experiences are a facet of

dissociative tendencies. As well, Ross et al. (1992) asserted that paranormal experiences discriminate between individuals with histories of childhood abuse from individuals without such a history. The impact of Ross et al.'s conclusions, however, are reduced to due to a lack of statistical validity. Multivariate techniques which would discriminate between groups were not used in Ross et al.'s studies.

McNulty (1994) did find that a history of emotional abuse discriminated between those who report sleep paralysis, an experience often associated with imagery which is often construed as paranormal, and those who did not. Physical and sexual abuse, however, did not discriminate the two groups in McNulty's study.

Thus, based on this previous work it was hypothesized, therefore, that history of abuse would not differentiate groups of participants reporting an anomalous experience from a normative control group.

Sleep Phenomena

A cursory examination of reports of UFO-alien, religious visions, and apparitions reveals that they frequently take place under situations of reduced external referents (e.g., at night, alone, in natural settings, while sleeping, immediately upon waking from sleep). Few of the UFO-intense reports cited in Spanos et al. (1993) were experienced simultaneously by more than one person. Spanos

et al. concluded that reduced external sensory stimulation plays a role in the production of UFO encounters. Spanos et al. also found that the experiences of the UFO-intense group were more likely to be associated with sleep, notably during sleep onset or sleep outset. Fourteen percent of the subjects reported symptoms concordant with characteristics of sleep paralysis, a condition often cited in connection with apparitional and religious experiences (Green & McCreary, 1975; Hufford, 1982; Seigel, 1988). Margolis and Elfison (1979) found that religious experiences such as voices or visions, although interpreted as divine communication, are often associated with dreaming. Religious visions associated with dreaming formed a distinct factor in their factor analytic typology of religious experience.

Diminished External Reference

Other research also provides considerable evidence that sensory deprivation leads to aberrant perceptual experiences. Common examples of alterations in thought and perception that can occur in a situation of diminished external reference include the alterations of perception which accompany sleep onset (hypnagogia) and sleep outset (hypnopompia), as well so called "sleep drunkenness" and sudden arousal out of sleep (Mavromatis, 1987). Research which involves deprivation tanks, in which the subject floats in a salt solution at body temperature while in a sound and light proof chamber, has shown that aberrant

perceptual experiences resembling hypnagogia may arise within 10 minutes of enclosure (Lilly, 1974; Hood, Morris & Watson, 1990).

The Physiognomic Cue Test (PAS), was designed by Stein (1975) as a means of identifying individuals who regularly imbue inanimate objects with affective or dynamic qualities where none exist. It is based on the theory of physiognomy proposed by Werner, & Kaplan (1948). The use of the word "physiognomy" in this context is not to be confused with the use of facial features to judge personality or temperament. This measure correlates significantly with creativity, and thus is expected to be closely related to absorption and fantasy proneness. Despite the apparent multicollinearity of physiognomy with the two other measures of imagination employed in this study, the PAS differs in that it directly taps dynamic visual transformation/animation. This test then provides a means of identifying individuals who tend to think in ways that may lead to overinterpreting an ambiguous event in terms of holistic, dynamic principles, and thus provides a way of partially quantifying the Diminished External Reference hypothesis. It is predicted that the PAS will serve to distinguish between the control and anomalous experience groups.

It was predicted, as well, that anomalous experiences would typically occur at night, or under circumstances of diminished external reference. It is also hypothesized that

conditions of sleep, apart from dreaming, which are characterized by reports of affect and imagery (hypnagogia, hypnopompis, sleep paralysis) will be significant predictors of anomalous experiences. These borderline periods between sleep and complete wakefulness are hypothesized to provide an imaginal context conducive to the formation of an anomalous experience.

Systems of Belief and Subcultural Support

Subcultural support (support for beliefs that are not overt components of the mainstream religious or social environment) is increasing for belief in the supernatural as adherence to traditional religion is declining (Grimmer, 1992). Interestingly, Bainbridge and Stark (1980) found that people with no religious beliefs were more likely than religious individuals to believe in unconventional ideas, such as the paranormal. Based on their finding, Bainbridge and Stark asserted that scientific rationality does not fill the wake that is left when society spurns traditional systems of belief.

Spanos et al.'s (1994) results suggest that the UFO experience is an anomalistic perceptual/cognitive experience that is embedded in a matrix of prior supporting beliefs. A belief in UFOs was couched in terms of a religious perspective (e.g. "Jesus came to earth in a UFO", or "Jesus is an alien") in 41% of both UFO groups. This is in accordance with the findings of Spanos and Moretti (1988)

who concluded that some individuals, when stressed, attribute some of their vivid visual and auditory experiences to external sources which they interpret in terms of their religious beliefs as divine voices or visions. Hood, Morris and Watson (1990) found that social cuing caused some individuals to label aberrant perceptual experiences as "religious". Using Allport and Ross's (1967) typology of religious personality types, Hood et al. (1990) classified subjects as "Intrinsically" religious, "Extrinsically" religious or "Indiscriminately Pro-" religious. Intrinsically religious types are those for whom religion is central to self expression. Extrinsic religious types are those who do not subscribe to religious belief, and will continue to do so, regardless of positive social reinforcement in favour of religious belief. Indiscriminately pro-religious types exhibit religious convictions only in social contexts which have been designated religious. Prior to the elicitation of aberrant perceptual experiences through sensory deprivation, one group of subjects was told to expect religious experiences, while another was told to expect aberrant perceptual experiences. Hood et al. (1990) found that Extrinsically religious types did not describe their elicited anomalous experiences as religious, even when a religious interpretation was socially cued. Intrinsic religious types reported the experience to be religious even when a

religious interpretation was not socially cued. Indiscriminately pro-religious types reported religious experiences only when such an interpretation had been socially cued.

From the above research, it appears that social cuing in a quasi-experimental situation, as well as the characteristics of the participant, may have a powerful effect on the judgement the subject makes as to the reality and origin of the hallucination. In addition, it is suggested that the beliefs of the individual, together with the subcultural support for such beliefs, have a powerful effect on the form of the hallucination and the valuation placed on such an experience.

Participants in the present study who reported an anomalous experience were queried regarding their paranormal beliefs prior to the date of their experience and the support that was available to reinforce the views held by the participant, in order to assess the importance of these variables in the etiology of the anomalous experience.

Response Bias in Reporters of Anomalous Experiences

Spanos et al. (1994) found that reporters of anomalous experiences, as a group, scored significantly lower on the MMPI Schizophrenia subscale and significantly higher on a measure of self-esteem than both community and university control groups. The UFO non-intense group scored significantly lower on a measure of perceptual aberration

than either the UFO intense or control groups. In addition, UFO groups reported significantly lower levels of stress than the control samples. Scores, however, on these measures, as well as on measures which tap imaginal propensities, were positively correlated with intensity. Thus experiencers reporting especially complex, involved or bizarre experiences were also likely to show concomitant elevations in scores on psychopathology and imaginal propensity scales. Although these results could be veridical, Spanos et al. noted the possibility of a significant bias in the responding. It was hypothesized that UFO reporters were sensitive to the derision and disbelief that the public may show towards the reports of their UFO experiences, and modified their responses to the measures of psychopathology in order to present themselves as sane, rational and well adjusted.

In order to test the "response bias" hypothesis, all participants were administered a scale of social desirability. This scale measures the tendency to portray one's self as consistent with the perceived demands of the situation. This measure allows the identification of trends in response bias. It was hypothesized that groups would fail to differ on the basis of social desirability, and that no correlation would exist between social desirability and the intensity, complexity or imaginativeness of the reported anomalous experience, in the present sample

The Present Study

One of the purposes of this study was to collect empirical data on participants reporting contact with ghosts, as well as those reporting UFO and religious experiences. Relationships were examined between each of these experiences and measures of imaginative involvement, temporal lobe lability, hypnotizability, psychopathology, abuse, sleep related experiences and, belief in the paranormal, as outlined above.

One goal of this was to determine if there is a continuum of anomalous hallucinatory experiences, from relatively low intensity experiences that are the result of misperception, to relatively complex, intensive experiences that are the result of high levels of imaginative involvement. It was predicted that reporters of anomalous experiences would score significantly higher than control samples on measures of psychopathology. Furthermore, it was hypothesized that most anomalous experiences would take place at night, under conditions of diminished external reference, and would be significantly correlated to sleep experiences such as hypnagogia, hypnopompia, and sleep paralysis. It was not expected that a history of abuse, sexual, physical or emotional, would predispose one to having anomalous hallucinatory experiences. It is hypothesized that although there is a continuum of anomalous hallucinatory experience in the general population, that

this reflects a concomitant continuum of aberrant temporal lobe activity, as proposed by Persinger et al. (1990). It was expected that reporters of anomalous hallucinatory experiences would endorse significantly more paranormal beliefs than control populations. It was hypothesized that these beliefs are in place prior to the experience and inform the content and credibility of the anomalous experience.

Method

Participants

This study involved three sessions for participants in the control group, and four sessions for participants reporting an anomalous experience. In Phase One, 2220 Introductory Psychology students in the Mass Testing Program at Carleton University were given a screening questionnaire as a means of locating individuals who have had anomalous experiences. The initials of the 348 individuals who reported an anomalous experience were placed, in random order, on master sheets. All individuals were then called and asked to participate in the study. 48 participants completed the final session of the study. Participants who did not report an anomalous experience served as controls. All participants received course credit for their participation.

Materials

Phase I: A screening questionnaire was administered to

all students attending a class during the Psychology Department's Mass Testing program. The questionnaire was a modification of that used by McNulty (1994) which assessed sleep related experiences (Appendix A). The modification included 3 questions regarding three types of anomalous experiences (Ghost/spirit, UFO abduction and deity/supreme being experiences).

Phase II: All participants who agreed to participate in Phase II were administered a package containing the following items:

- 1) An Informed Consent Form (Appendix B) which explained that the participant's participation was completely voluntary and that they could withdraw from the study at any time with impunity. Participants were further informed that all information regarding the study was strictly confidential and to be used for research purposes only. Participants reporting an anomalous experience received an extended consent form which stated that they might be taped in an interview regarding their experience.
- 2) Tellegen and Atkinson's (1974) Absorption scale is a 24-item questionnaire which measures the tendency for individuals to become involved in imaginary thought and sensory experiences. Spanos & Chaves (1989) reported significant positive correlations of moderate magnitude between this scale and measures of daydreaming and fantasy proneness. It has failed to correlate significantly with

personality and psychopathology, demonstrating its divergent validity (Spanos & Moretti, 1988).

3) Hood's Mysticism Scale (Hood, 1975) assesses reported mystical experiences. Mystical experience is defined by experiences of unity and transcendence (Hood, 1975).

Transcendent experiences are those that go beyond mundane perceptual experiences. Unity is the feeling that one's self is not distinct from the environment. This scale positively correlates with absorption as well as openness to experience (Hood, 1975; Spanos & Moretti, 1988).

4) A combined Perceptual Aberration Scale (Chapman, Chapman, & Raulin, 1978) and Magical Ideation Scale (Eckblad & Chapman, 1983). The Perceptual Abberations Scale (PAS) is a 35 item self-report questionnaire that measures distortions in the perception of bodily image and worldly objects, experiences typically found in schizophrenics (Meehl, 1964). This scale successfully discriminated individuals with psychotic-like mentation from normal college students. (Allen, Chapman, Vuchetich & Frost, 1987). The PAS has an internal consistency alpha coefficient of .90, and a test-retest reliability of .75 (Chapman and Chapman, 1985).

5) The Personal Philosophy Inventory (PPI) (Persinger, 1984) contains items directly or indirectly tied to the measurement of aberrant temporal lobe activity in normal individuals (see Introduction for theoretical review). The

PPI was found to have test-retest reliability of .90 after ten days, and .65-.75 after 100 days. The reported internal and external reliability of the PPI is adequate (Persinger, 1984).

6) The Wilson-Barber Inventory of Childhood Memories and Imaginings (ICMI) (1981) measures the construct of fantasy proneness. Rhue and Lynn (1989) report adequate reliability for this scale.

7) The Symptom Checklist (SCL-90R) (Derogatis, 1977) is an inventory of self-reported symptoms related to dimensions of psychopathology. The dimensions included in this study were somatization, interpersonal sensitivity, obsessive-compulsivity anxiety, and phobic anxiety. Other subscales include hostility, psychoticism, dissociation, depression, and paranoid ideation (Derogatis, 1977). Concurrent validity has been demonstrated through the significant correlations of the subscales to the Minnesota Multiphasic Personality Inventory (MMPI). Correlations ranged from .50 to .75. Correlations were strongest between like scales (Derogatis, 1977).

8) Major Events Inventory (Cuddy, 1990) is composed of positive and negative life events. The questionnaire requires participants to indicate major events which they experienced. This instrument was used to identify individuals who had experienced unwanted physical, sexual and emotional abuse.

9) The Dissociative Experiences Scale (Bernstein & Putnam, 1986) is an inventory of 28 items which tap dissociative experiences from the minor to the psychopathological.

Participants are asked to make a slash on a percentage line (0% -100%) to rate the percentage of time the participant has experienced the item. Bernstein and Putnam (1986) found that patients with a diagnoses of Multiple Personality Disorder or Post Traumatic Stress Disorder scored higher on the DES than did college students, normal adults, or psychiatric patients with non-dissociative disorder diagnoses. This establishes the discriminative validity of the DES. Ross, Joshi and Currie (1990) found the DES distribution to be continuous, and without bimodality.

10) Diabolical Experiences Questionnaire (DEQ) (Spanos & Moretti, 1988). is a measure of the degree to which an individual has had experiences he or she judges to be evil, diabolical, and involving Satan, or any evil entity. The 26 items of the scale were intercorrelated and subjected to a factor analysis, which indicated unidimensionality. The reliability of the DES was high ($\alpha=.92$).

11) The Physiognomic Cue Test (PCT) (Stein, 1975). Based on Werner's (1948) concept of physiognomy, this scale is a measure of the tendency to see living and or dynamic properties in geometric shapes. It is a measure of cognitive style and is positively correlated with measures of creativity. Stein (1975) reports adequate internal

consistency and reliability.

12) The schizophrenia subscale of the Minnesota Multiphasic Personality Inventory. This is the most frequently used test to diagnose schizophrenia, or schizotypal tendencies.

Reliability and consistency measures for the MMPI-Sc are very high (Graham, 1990).

13) The Rosenberg Self-Esteem Scale. This scale is designed to assess self-esteem. The validity reported for the scale is adequate (Rosenberg, 1965).

14) A Religious Beliefs questionnaire (Appendix C). This measure was designed to tap belief in paranormal entities such as ghosts, angels, and devils. It was developed specifically for this study, and asks four yes/no type questions (e.g. "Do you believe in angels?").

15) Marlowe-Crowne Scale of Social Desirability. This scale measures one's tendency to present in ways one thinks are deemed socially appropriate. It is hypothesized to be a measure of response bias, or the tendency of a participant to skew his/her answers to present as more socially desirable (Martin, 1984).

Phase III: This phase was designed to measure the degree to which each participant was hypnotizable, and involved the following measures:

1) Shor, Orne and O'Connell's (1966) revision of the Betts Imagery Vividness Scale was used to assess subjective reports of the vividness of various imaginary scenarios.

This scale is a fifteen item questionnaire which includes items directed to each sense modality, but is specifically concerned with visual imagery. The reliability coefficients for internal consistency of the variables tapping imagery were greater than .91 across two administrations (Shor, Orne, and O'Connel, 1966). This scale is also significantly correlated with hypnotizability ($r=.56$) (Spanos & Radtke, 1981).

2) The Carleton University Responsiveness to Suggestion Scale (CURSS) (Spanos, Radtke, Hodgins, Bertrand, Stam, & DeBreuil, 1983) was administered to all participants. The CURSS is a 7 item test designed to measure overt, subjective responses to a standardized hypnotic induction. Two suggestibility scores are assessed: The CURSS:O scale (objective or overt responding) and the CURSS:S (subjective responding). Test-retest correlations are acceptable (Spanos, Radtke, Hodgins, Bertrand, Stam & DuBreuil, 1983).

Phase IV: All participants who reported an anomalous experience were asked to participate in a semi structured interview (Appendix D). Participants were asked to describe the experience in as much detail as possible. Several questions probed events surrounding the experience, as well as beliefs before and after the experience. Although the interview was designed to elicit information regarding the experience, the interviewer refrained from asking leading questions, or providing one-sided suggestions to the

participant.

The interview was content analyzed in order to code specific facets of the anomalous experience to facilitate further comparisons. Items may be classed into Person Centred, Social Centred and Experience Centred categories.

Person Centred : These variables included the frequency of experiences, the emotionality of the experience, the number of years ago that the experience occurred, experiences with the Ouija Board (a common, mass marketed divination device), experience with other paranormal rituals, and prior paranormal beliefs.

Social Centred: These group of variables involved the matrix of social support surrounding the experient and was composed of peer reports of similar experiences, family reports of similar experiences, the response of the peer group to the participant's experience, if the peer group was informed about the experience, and the family's reaction to the participant's experience, if reported. In addition, a variable emerged from the a preliminary examination of the participant's protocols. This variable tapped the death of a relative, friend, or loved one prior to the anomalous experience.

Experience Centred : This cluster of variables was concerned with the phenomenology of the reported experience. Specific items included the senses involved in the perception of the anomaly, the time of day, whether or not

it was sleep related, whether a figure or entity of some sort was present, the corporeal form of this entity, if present, the activity of the entity, whether or not the figure was familiar to the experient, whether or not the figure spoke, and whether or not non-verbal communication occurred. Two independent raters rated the protocols on these variable groups. Disagreements on items were resolved until agreement reached 100%.

From these groups of variables, seven were chosen as indices of the intensity or impact of the experience. These variables were chosen to reflect facets of intensity because they assessed how convincing, or realistic the individual felt the experience was in relation to real events. An overall score for each participant reporting an anomalous experience was computed by summing across these seven variables. These categories included the frequency of the experience(s), the emotionality (positive or negative emotion vs. neutral response), the number of senses involved in the experience (senses were also ranked, in an effort to reflect the convincingness and impact of the experience), whether there was a figure or entity present during the experience, the form that the figure took (as with senses, this item taps the impact of the experience in terms of its convincingness), whether the entity engaged in movement or activity of some sort, and whether the entity engaged in some form of communication, vocal or otherwise (telepathic,

non-verbal, felt meaning) with the experient.

Procedure

All participants filled out the questionnaires in Phase II. The order of questionnaires in each package was varied at random. Packages were filled out in groups of two to ten participants in a room at one time, in the presence of the principal investigator. Participants typically completed Phase II in one and one half to two hour period. In Phase III Participants were administered the CURSS. Again, the CURSS was administered in groups of two to ten participants. Each participant filled out his/her own CURSS response booklet. The session lasted a total of fifty minutes. The overt (CURSS:O) score that the participant obtained was provided to the participants after the hypnosis session. Only participants reporting an anomalous experience were administered a semi-structured interview. The interview typically lasted twenty to forty five minutes, depending on the complexity and frequency of the reported experience. Control Participants were debriefed following the CURSS and given course credit for their participation. Those reporting anomalous experiences were debriefed following the interview.. All participants were informed that their responses to the tests, and the interview were strictly confidential. All participants were given course credit for their participation

Results

Division of the Anomalous Experience Group

As noted earlier, a continuous measure of intensity was constructed from relevant items gleaned from the content analysis. The 50th percentile was used as a cutoff point to dichotomize the anomalous experience participants into two distinct groups: those who reported relatively simple, static experiences and who therefore scored below the cutoff point on the intensity index, and those whose reports were more involved, and therefore scored above the cutoff point on the intensity index. Thus, statistical analyses were performed on three groups: the low intensity anomalous experience group, the high intensity anomalous group, and a normative university sample. Table 1 A,B and C report the means, standard deviations, number of responders, and range of scores for each of the three groups on all measures. Table 1 represents the means, standard deviations, number of responders, and range of scores for each of the content analysis items.

Insert Table 1 A about here

Insert Table 1 B about here

Insert Table 1 C about here

Response Bias in Responding

Because Spanos et al. suggested that the need for reporters of anomalous experiences to appear socially desirable may cause a significant bias in the ways that they respond to measures of psychopathology, and imagination, an analysis of possible bias in responding was carried out. A 3(Group) x 2(gender) factorial ANOVA revealed no relationship between a measure of social desirability and group or gender (See Appendix E for a summary). Social desirability did not correlate with intensity of experience ($r = -.17$, $p = .21$). Thus it was concluded that there was not a significant bias in the responses that participants gave to any of the measures.

Factor Analysis

An exploratory Factor Analysis was performed to identify distinct sets of variables that could be used to predict anomalous experience in Multivariate Analysis of Variance (MANOVA). An examination of the correlation matrix for all variables revealed multiple patterns of correlation. In conjunction with these patterns, the 28 variables which appeared to have the greatest number of correlations with other measures were chosen and entered the analysis (Tabachnick and Fidell, 1989).

A Principal Components analysis revealed seven unrotated factors. On the basis of the scree plot, and eigenvalues, five factors were forced into a Varimax rotation, with Principal Axis Factoring. Items loading higher than .3 on a factor were retained. Approximately 67.2% of the variance was explained by the five factors. The first factor was composed of the MMPI sc, The Dissociative Experiences Scale, and all of the measures of psychopathology administered from the SCL-90R. This factor was called the Psychopathology Factor. Factor two consisted of all of the submeasures of the CURSS. This factor was labelled the Hypnotizability Factor. The third factor was composed of the Perceptual Aberration and Magical Thinking scales, as well as the XT (temporal lobe), PA, and LB subscales of Persinger's PPI measure. This factor was labelled Propensity for Alterations in Thought and Perception (PAT-P) Factor. The fourth factor was defined by the two physical (before and after 12 years of age), and two sexual (before and after 16 years of age) abuse items, and the emotional abuse item from the Major Events Inventory. This Factor was called the Abuse Factor. The fifth and final factor to emerge was defined by the Tellegen Absorption Scale, the ICMI (fantasy proneness) and the Physiognomic Cues test. This factor was termed the Imaginative Involvement Factor. A summary of the factors and their constituent scales and factor loadings is presented in Table

2. Standardized z-scores were computed for the measures that loaded on each factor. Z-scores for the measures that loaded significantly onto each measure were added to produce Factor scores. These Factor scores were entered as dependent variables in a MANOVA.

Insert Table 2 about here

Psychopathology, Imaginative Involvement and the Propensity for Alterations of Thought

A 2 (gender) x 3 (group) x 5 (Factors) MANOVA yielded a significant multivariate effect for gender, $F(5, 84)=2.8$, $p=.021$. Univariate analysis was significant, $F(1,116)= 6.9$, $p=.01$, indicating that females ($M=.68$) scored significantly higher than males ($M=-1.48$) on the Hypnotizability factor (See Table 3). There was a significant multivariate effect for group, $F(10, 166)= 2.87$, $p=.003$. Univariate analyses revealed significant effects for the Psychopathology $F(2,105)=7.52$, $p=.0009$, Propensities for Alterations in Thought and Perception (PAT-P), $F(2,106)= 14.7$, $p>.0001$ and Imaginative Involvement, $F(1,104)=9.7$, $p=.0001$ factors. Low and High intensity groups together scored significantly higher than controls on the PAT-P (M high intensity=1.23, M low intensity=.94, M control= -1.78) and Imaginative Involvement factors (M high intensity=1.3, M low intensity=

24, M control = -1.4). The high intensity group scored significantly higher on the psychopathology factor (M high intensity = 3.36) than both the control and low intensity groups (M low intensity = .31, M control = -1.87). Groups did not differ significantly on the Hypnotizability or Abuse factors (See Table 3).

Insert Table 3 about here

The multivariate effect for group was followed up with Discriminant Function Analysis. The first function was highly significant ($X^2 = 31.910$, $p = .0001$) in discriminating between the control group, and combined high and low intensity groups. The second function, which approached significance ($Xp = 6.95$, $p = .13$) discriminated between low intensity and high intensity groups (See Table 4 for standardized canonical correlations). The factor that most defined this first function was the PAT-P. This factor accounted for 82% percent of the variance in the sample. Low and high intensity groups taken together scored significantly higher on all measures subsumed in the PAT-P than the control group. It should be noted as well that low and high groups differed but not to the extent that the two groups together differed from the control group. The second function accounted for 18% of the total variance. This function served to discriminate between high and low

intensity groups. This factor was defined by high scores on the imaginative involvement and psychopathology factors, but extremely low scores on the PAT-P. Function one correctly classified 68% of the cases. The Discriminant Analysis was able to predict group membership 83% of the time for controls, 50% for the low intensity group, and 39% for the high intensity group.

Insert Table 4 about here

Sleep Related Imagery and Experience

A 3 (group) x 2 (Gender) x 4 (Sleep imagery variables) MANOVA was performed. Sleep imagery variables which tapped sleep disturbance experiences usually accompanied by affect and imagery were considered. These included hypnagogic (sleep onset) and hypnopompic (sleep outset) experiences, sleep paralysis, and night terrors (powerfully negative affective experiences at sleep outset, usually accompanied by intense fear) (Thorpy and Glovinsky, 1987). There was no multivariate effect for gender by group, nor was there a significant multivariate effect for gender. The multivariate effect for group approached significance, $F(10,168) = 1.80$, $p = .065$, (See Table 5) and thus univariate effects were examined (Tabachnick & Fidell, 1989).

Insert Table 5 about here

The univariate effect of sleep paralysis approached significance, $F(2,97) = 2.94$, $p = .057$. The High intensity group scored higher on sleep paralysis ($M = .55$) than the low intensity ($M = .28$) and control ($M = .27$) groups. The univariate effect for the experience of night terrors before the age of twelve (defined as waking up screaming in fright) was significant, $F(2,97) = 3.8$, $p = .03$. Both the high ($M = .57$) and the low ($M = .48$) groups scored significantly higher on this variable than the control group ($M = .20$). As well, the univariate effect for the experience of night terrors after the age of twelve was significant, $F(2,98) = 5.7$, $p = .005$. The high intensity group scored significantly higher ($M = .52$) on this variable than the controls ($M = .12$). The univariate effect for hypnagogia approached significance, $F(2,98) = 2.9$, $p = .06$. Participants in the Low intensity group reported significantly more hypnagogic experiences ($M = 1.8$) than the controls ($M = 1.3$).

A Discriminant Function analysis followed-up the multivariate effect for group. One significant function emerged ($X^2 = 23.3$, $p = .01$). This function significantly discriminated between the High intensity group, and the Low intensity and control groups. This function was defined by high scores on the Night Terror experiences item for the

period following the age of twelve and by the experience of sleep paralysis (See Table 6 for standardized canonical correlation coefficients). This function accounted for approximately 75% of the total variance and correctly classified 55% of the cases. The Discriminant Analysis was able to correctly predict group membership 85% of the time for controls, 21% of the time for the low intensity group, and 35% of the time for the high intensity group.

Insert Table 6 about here

Beliefs

A 2 (gender) x 2 (groups) x 6 (Beliefs) MANOVA was performed on the paranormal/ religious belief items (belief in ghosts, belief in devils, belief in angels, belief in God or a supreme being) as well as the Hood Mysticism and Diabolical Experiences Scales (See Table 7) The multivariate gender by group interaction was not significant. There was no significant multivariate effect for gender. There was a multivariate effect for group, $F(12, 186) = 8.45, p < .001$, with only the Hood Mysticism Scale failing to achieve statistical significance. Univariate analyses revealed that control participants were significantly less likely to report a belief in ghost ($M_{\text{control}} = .30$) than the participants in the High intensity ($M = 1.00$) and Low intensity ($M = 1$) groups, $F(2, 107) = 62.34, p < .00001$. The

univariate effect of belief in angels was significant, $F(2, 107)=4.95$, $p=.009$). The low intensity group scored significantly higher ($M=.7941$) than either the High intensity group ($M=.70$) or the control group ($M=.48$). The univariate effect for the diabolical experiences scale was significant, $F(2, 107)=4.84$, $p=.01$). The Low intensity group scored significantly higher ($M=27.85$) than the High intensity ($M=21.52$) and control ($M=15.43$) groups. There was a univariate effect for belief in devils, $F(2, 107)=11.79$, $p<.0001$. Low intensity ($M=.71$) and High intensity ($M=.65$) groups scored significantly higher than controls ($M=.23$). The univariate test for belief in God or a supreme being was not significant, $F(2, 107)=2.31$, $p=.10$). As well, the univariate effect for the Hood Mysticism Scale was non-significant, $F(2, 107)=.43$, $p=.65$.

Insert Table 7 about here

A discriminant function analysis was used to follow-up the multivariate effect, and yielded one significant function ($X_p=83.54$, $p<.00001$); defined exclusively by the belief in ghosts (See Table 8 for a summary of the standardized correlation coefficients). This function explained 98% of the total variance, and correctly classified 68% of the cases in the sample. The Discriminant Analysis was able to correctly predict membership in the

control group 70% of the time, and membership in the low intensity and high intensity groups 97% and 11% of the time, respectively.

Insert Table 8 about here

Differences Within the Anomalous Experience Group

Recall the division of the group of participants reporting anomalous experiences into low and high-intensity-of-experience groups. This was accomplished through categorization based on a cutpoint equal to the 50th percentile. The intensity index was derived from seven content analysis items which measured frequency of experience, emotionality, if the entity had a form, the distinctness of the form taken, the now engaging the experience was to the senses, and whether or not a form of communication was used by the entity (non-verbal, or verbal). Table 9 shows the number of participants who endorsed each of these items on the intensity index.

Insert Table 9 about here

The following items were used to derive a measure of intensity: 1) Seeing a Figure: Chi square analyses revealed that significantly more people in the High intensity group

reported seeing a figure of some sort during the experience X^2 (df=1) =8.9, $p=.01$. (2) Movement of the Entity: 90% of the Low intensity, and 9% of the high intensity groups reported that the entity did not engage in any activity or movement. The Chi square was significant (X^2 (df=1)= 6, $p=.01$) (3) Spoken Communication by the Entity: A chi square analysis examining whether or not the entity in the experience communicated was significant (X^2 (df=1)= 20.1). Significantly more people in the low intensity group reported that, if an entity was present, it did not attempt communication. (4) Non-Verbal Communication by The Entity: 80% of the Low Intensity group reported no attempt at non-verbal communication (telepathic speech, felt meaning or communication through the Ouija board) by the entity (X^2 (df=31)= . $p=.01$)), whereas 63% of the High intensity group reported no non-verbal communication. The Chi square was not significant (X^2 (df=1)= 1.9.(5) Sensation: 82% of the High Intensity group, and 42% of the Low intensity group reported that the experience involved sight and sound. The Chi Square for the number of senses that were involved in the experience was significant (X^2 (df=1)= 8.6).(6) Frequency of Experience: The Chi square for the frequency of experience (here low frequency was less than two experiences, high was greater than two experiences) was significant (X^2 (df =1)= 20. 94% of the Low intensity group reported less than two experiences whereas 63% of the High

intensity group reported more than two experiences. (7)

Apparent Form of the Entity: The Chi square for form was significant (X^2 (df=1) =8.56). 82 % of the High intensity participants described a form that was solid, very much the same as a real figure would appear. 42% of the Low intensity group reported seeing a solid, realistic form during the experience.

Summary: The high intensity group was more likely to report seeing a figure during the experience, and report that the entity engaged in some activity or movement compared to the low intensity group. The High intensity group was also more likely to report that the experience involved sight, sound and another sense than the Low intensity group. High intensity participants also reported a greater number of anomalous experiences throughout the interview than those in the low intensity group. High intensity participants were more likely to report that if a figure was present during the experience, it had a solid, life-like form.

Content Analysis Items Not Related to Intensity

Several variables taken from the content analysis of the interviews, which were not used to code the intensity of the anomalous experience are presented below. Table 12 represents the chi square values for these items, by category (Person centred, Social Centred, Experience centred).

Insert table 10 about here

Person Centred: Explanation given for the Experience: The overall Chi Square for intensity by explanation was not significant, $X^2(df=2)=2.8$, $p=.25$. The vast majority of the high (77%) and low (83%) intensity groups, however, gave a supernatural explanation for the experience. Experience with the Ouija Board: The Chi Square for the use of the Ouija board (a popular device used to communicate with "spirits") was not significant, $X^2(df=1)=.0016$, although 71% of the low intensity group reported using it at one time. Prior Beliefs: The Chi Square for previous beliefs of a paranormal nature was significant, $X^2(df=1)=4.5$. 100% of the High intensity group reported holding one or more beliefs in the paranormal (ghost, deities, angels, devils, multiple paranormal). 78% of the Low intensity group reported holding a paranormal belief prior to the anomalous experience took place.

Experience with Other Paranormal Rituals: The Chi Square for experience with paranormal rituals other than the Ouija Board (e.g Tarot cards, the I-Ching, reading tea leaves) was not significant ($X^2(df=1)=0.04$), although 71% of the Low intensity, and 72% of the High intensity groups reported an experience with at least one type of paranormal ritual.

Experience Centred: Familiarity of The Figure: The Low and High intensity groups failed to differ in the frequency with which they reported that the figure was one familiar to them, $X^2(1)=1.3$, $p=.26$. Was it All A Dream?: The Low and High intensity groups did not report that the experience was a dream. Only 7% of the Low intensity group, and 9% of the High intensity group reported that the experience was a dream, $X^2(df=1)=.12$, $p=.72$. Hypnagogic Experiences: The overall Chi Square for whether the experience occurred at sleep onset was not significant $X^2(df=1)=1.8$, $p=.18$. However, significantly more Low intensity participants (83% vs. 16%) were apt to describe the experience as not occurring at sleep onset, compared to those participants in the High intensity group. Hypnopompic Experiences: The Chi Square for whether the experience occurred at sleep outset was not significant, $X^2(df=1)=1.5$, $p=.22$. Roughly equal numbers of Low and High intensity participants reported the experience as occurring at sleep outset. Anomalous Experiences Occurring at Night: The Chi square analyses comparing the High and Low intensity groups on whether the experience occurred at night was not significant, $X^2(df=1)=58$. The majority of the High and Low intensity groups (90% and 96% respectively) reported that the experience was nocturnal. Sleep Related: The chi square for whether or not the anomalous experience was sleep related approached significance, $X^2(df=1)=3.32$, $p=.06$. 82% of the

participants in the High intensity group reported that the experience was sleep related. Positive/Negative Emotion: The chi square for this item was not significant, $X^2(df=1)=.78$, $p=.68$. Roughly equal percentages of the low (40%) and high intensity (36%) groups reported that the experience was negative.

Social Centred: Recent Death: The Chi Square for whether or not a death recently preceded the anomalous experience was not significant, $X^2(df=1)=.14$. Family Experiences : The Chi Square for whether or not a member of the individual's family reported an anomalous experience was not significant, $X^2(df=1)=.34$. Family Response: The Chi Square for the type of response (support/endorse, criticize/non-support, indifferent) the individual received from his/her family upon reporting his/her anomalous experience was not significant, $X^2(df=2)=1.3$. Peer Experiences: The Chi Square for whether or not the individual's peer group had reported experiences similar to that of the individual was non-significant. $X^2(df=1)=1.16$. Peer Response: The Chi Square for the kind of response (support, indifference, doubtful/non-supportive) the individual received from his/her peer group when he/she reported the anomalous experience was not significant, $X^2(df=1)=.24$.

Summary: Neither of the groups differed significantly on the Social Centred items. The majority of both groups

reported having had experienced a paranormal ritual prior to the experience. Both groups held one or more paranormal beliefs prior to the experience. Both groups were very likely to give paranormal explanations for the experience. The vast majority of experiences happened at night.

Discussion

The present findings are consistent with early theoretical distinctions between those hallucinatory experiences related to psychopathology and those related to misperception and imagination. In the present study, participants in the reporting groups tended to score significantly higher on factors which assessed psychopathology, imaginative involvement, and subscales of Persinger's Personal Philosophy Inventory which measure paranormal experiences, exotic beliefs, and aberrant temporal lobe activity. This result is contrary to Spanos et al. (1994), who found that overall, groups reporting UFO experiences scored significantly lower than control samples along dimensions of psychopathology. The results of the present study, however, are in keeping with the finding by Spanos et al. that intensity of experience correlates with fantasy proneness and psychopathology in a group that reported particularly intense UFO experiences. Spanos et al. hypothesized that UFO reporters may have altered their patterns of response to the measures of psychopathology to present to the experimenter as sane, rational individuals.

Spanos et al. speculated that they did this because of the derision they felt was associated with reports of aliens in spacecraft. In order to assess the possibility of a response bias in the present study, a measure of social desirability was administered.

Social Desirability

In the present study, social desirability did not correlate with intensity of experience. In addition, groups did not differ on the tendency to respond in ways deemed socially appropriate. These results strengthen the overall conclusions of this study. It is unlikely that all participants, regardless of whether or not they reported an anomalous experience, altered their responses to questions concerning psychopathology and imagination in order to project a certain type of image to the experimenter.

Spanos et al.'s (1994) speculation that the UFO reporters wished to project the image of being untroubled in order to deflect the derision directed at UFO sighters and abductees may be related to the differential social acceptance of various types of anomalous experience. The reason for this difference in the desire to alter one's self-presentation is unclear, but may have to do with the differential acceptance by the public of various types of anomalous experiences. For example, anomalous experiences involving ghosts, which composed the majority of reports in this study, may be more socially acceptable than reports of

UFOs and alien abductions. The telling of ghost tales, either personal or relayed from another source is a common feature of some social activities (i.e. "the campfire ghost story"), as is the attempt to contact spirits of the deceased through the Ouija board. UFO abductions, on the other hand, may not have reached this level of acceptance in similar social settings. As a result, it is possible that those who reported seeing ghosts or spirits were less concerned about appearance and social acceptance because of the wider cultural acceptance and support available for such experiences. An interesting avenue for study would be the content analysis of films and television program. of a paranormal nature to determine the extent to which various paranormal experiences or "phenomena" are represented. In order to test the hypothesis that UFO sighters are more concerned about issue of social presentation and desirability than their ghost sighting counterparts, participants reporting each type of experience need to be compared on measures of social desirability.

The finding that participants did not alter their responses for matters of self-presentation allows several critical differences between and within reporting and control groups to be considered. On the whole, groups reporting anomalous experiences differed from a control group in terms of tendencies towards greater levels of imaginative involvement, the propensity for misperceptions

and magical forms of thought, and the tendency to score higher on a battery of tests designed to measure psychopathology.

In turn, results also revealed two types of individuals reporting anomalous experiences.

Intensity Groups

One group was composed of participants who reported experiences of relatively low intensity. The experience was typically ambiguous, ill defined, and static. A second group was composed of participants who reported highly intense experiences which were highly involved, with the presence of discernible figures which moved or engaged in some form of activity and that frequently engaged in either verbal or non-verbal communication with the participant. The low intensity group was differentiated from the high intensity group in terms of a factor which tapped perceptual distortions and magical thinking, as well as Persinger's measures of temporal lobe activity, paranormal experiences, and liberal beliefs.

Persinger (1990) theorizes that the temporal lobe scale, although a paper and pencil measure, taps occurrences of aberrant temporal lobe electrical activity. Persinger theorizes aberrant temporal lobe activity is the sole etiology for anomalous experiences, not unlike the early theory of brain dysfunction given by Brierre De Boissement (1853). Convergent evidence for this theory comes from the

finding that both measures of paranormal experiences and belief in the paranormal load onto a factor with the temporal lobe subscale. In this study, however, the subscales of the PPI loaded onto a single factor with measures that assessed perceptual aberration and magical thinking. Although it is possible that both of these measures tap behaviours which have their basis in aberrant temporal lobe electrical activity, perceptual aberration and magical thinking may also reflect behaviours independent of temporal lobe functioning. It is hypothesized then, that at least in the context of the population in this study, the validity of Persinger's scales lie in the measurement of the propensity to experience alterations of thought and perception. The factor which is defined by Persinger's scales and measures of perceptual aberration and magical thought was termed the PAT-P (Propensity for Alterations in Thought and Perception).

Propensities for Alteration In Thought and Perception

Groups reporting anomalous experiences differed from a control primarily along the PAT-P dimension. This supports Spanos et al. 's (1994) general conclusion that anomalous experiences are primarily misperceptions of actual external cues, elaborated by patterns of thought which form connections between events and perceptions where none exist.

Moreover, the High intensity group was distinguished from the Low intensity group on the basis of lower scores on the

PAT-P factor, and higher scores on the imaginative involvement, and psychopathology factors. This finding reinforces Spanos et al.'s tentative finding of positive correlations between intensity of reported experience and measures of fantasy proneness and psychopathology. The latter finding that reporters of high intensity anomalous experiences score higher on a factor composed of several measures of psychopathology does not mean, however, that these experiences are exclusively the result of the presence of psychopathology. There were relatively few individuals with extreme scores on these variables.

The same continuum of intensity of experience vis-a-vis fantasy proneness that was proposed by Spanos et al. was confirmed in this study. However, a distinction was found between those reporting low intensity as opposed to high intensity experiences. The high intensity group tended to score high on the imaginative involvement factor, which was composed of the ICMI (fantasy proneness), Tellegen's Absorption Scale (TAS), and the PAS (Physiognomic Cue test). Taken together, the tendency towards high scores on these measures means that high intensity experiences were typically fantasy productions which were highly imaginative and involved, and were dynamic rather than static events. Recall that the PAS measures the tendency to imbue geometric designs with dynamic movement and affect. This tendency in the high intensity group is reflected by a greater tendency

to report the presence of realistic figures which engaged in some form of activity and/or communication compared to the low intensity group.

Hypnotizability

Imagination constructs such as absorption are strongly associated with hypnotizability. It was demonstrated that imaginal propensities play a significant role in the production of anomalous experiences. The finding that hypnotizability does not correlate with propensities for anomalous experience appears problematic. Nadon, Laurence and Perry (1990) demonstrated that highly hypnotizable subjects report a significant greater belief in the paranormal, as well as a higher frequency of paranormal experiences than medium or low hypnotizable subjects. On the other hand, Atkinson (1994) recently found a relationship between belief in the paranormal and hypnotizability, but no relationship between hypnotizability and reports of paranormal experiences. Spanos et al. (1993) found that individuals who reported UFO experiences of varying intensity were no more likely to be highly hypnotizable than non-reporting controls. The results of this study are in accordance with Spanos et al.

The reason for this lack of clear cut relationship between hypnotizability and anomalous experience, however, may have to do precisely with the strong correlations between measures of imagination and hypnotizability. In the

MANOVA, used in the present experiment, all factors competed together for percentages of the variance in explaining group differences. It is possible that the strong collinearity of the imaginative involvement factor with the hypnotizability factor reduced a significant amount of variance that the hypnotizability factor may have accounted for alone. The presence of these collinear factors together in previous studies may account for the inconsistency of findings in this area. This result, however, is contradicted by the failure of Spanos et al. to find a relationship using a univariate analysis in which there was no competition from other collinear variables. As well, Spanos et al. found that although UFO experience groups were more likely to report beliefs in a multitude of paranormal phenomena, these beliefs did not correlate with hypnotizability. In the present study, this absence of a relationship was confirmed by the finding that the Paranormal Beliefs subscale did not correlate with hypnotizability.

An alternative rationale for the lack of a relationship between hypnotizability and anomalous experiences could be that although a questionnaire may ask whether or not one has seen a ghost or a UFO, it does not inquire as to the credibility of this experience. In a related study, Spanos, Menary, Gabora, DuBrueil and Dewirst (1991) provided participants in a hypnotic session with the suggestion that they had led a past life. Participants high on imaginative

involvement were most likely to provide past-life experiences. However, among participants who generated past life experiences, imaginal propensities did not predict whether or not the participant treated the past life experience as real. Only belief in reincarnation, coupled with the expectancy of actually experiencing a past life predicted the degree to which the participant believed that the past life experience really occurred. Thus participants in the present study may differ in the degree of credibility they are willing to assign the experience. Further research is needed to clarify this area. On the basis of the findings of Spanos, Menary, Gabora, DeBrueil and Dewirst (1991), coupled with the finding that those who report high intensity experiences score higher than those who report low intensity experiences in terms of imaginative involvement, it is hypothesized that a high intensity group would assign a greater degree of credibility in a supernatural explanation.

History of Sexual and Physical Abuse

The hypothesis that abuse would not be a predictor of membership in a group of individuals reporting anomalous experiences was confirmed. In addition, it should be noted that, contrary to Ross, Joshi and Currie (1990), dissociative tendencies did not load on the same factor as physical or sexual abuse in the presence of other measures of psychopathology. In addition, history of sexual, physical and/or emotional abuse did not serve to discriminate between

those who reported anomalous experiences such as contacting or seeing ghosts and religious deities and those who did not. In order to clarify the issue of age (scales summed across experiences occurring in childhood and adulthood), further investigations coded experiences for occurrence in childhood and adulthood, and determined that groups could not be distinguished on the basis of traumatic experiences that occurred during or after childhood.

There was also no connection between emotional abuse and reports of anomalous experiences. This is contrary to McNulty (1993) who found that individuals reporting sleep paralysis were more likely to have suffered emotional abuse than controls. The failure to find this relationship, however, may be to the relatively low frequency (14%) of individuals who couched their experience of sleep paralysis in terms of a paranormal explanation or system of belief. In the present study, however, sleep paralysis emerged as a significant predictor of membership in a group reporting an anomalous experience.

Sleep Related Experiences and Imagery

The majority of anomalous experiences reported in this study were sleep related. These tentative findings support Spanos et al.'s (1993) conclusion that the majority of anomalous experiences related to UFOs and UFO-Aliens occurred under situations of diminished external reference, such as the portion of the day usually allocated to sleep.

In short, the overwhelming majority of participants in both groups (Low intensity=91%, High intensity=95%) reported that the experience was nocturnal.

The multivariate effect for sleep imagery variables by group closely approached significance ($p=.06$). As a result, some tentative conclusions can be suggested regarding the significance of sleep related imagery in the production of the anomalous experience. The high intensity group was significantly more likely to experience sleep paralysis than either the low intensity group or the controls. Both the low and high intensity groups were more likely to have had the experience of pavor nocturnes or night terrors after the age of twelve. The tendency to experience alterations in thought and perception during the sleep onset phase (hypnagogia) was close to significance ($p=.06$). The groups reporting an anomalous experience were best discriminated from the group that did not on the basis of sleep paralysis and night terrors occurring after the age of twelve. Although McNulty (1993) found that only 14% of the participants who reported the experience of sleep paralysis couched their explanation for the experience in paranormal terms, folk explanations of sleep paralysis typically endorse a specific supernatural frame of reference for the experience. Typically the sufferer of sleep paralysis reports a figure of some sort, often malevolent and associated with intense fear reactions. Such examples include the "Old Hag" syndrome in Maritime

Canada (Hufford, 1988) and the incubus and succubus of the medieval period (Siegel, 1992).

The incubus is explained by Hartmann (1984) not as sleep paralysis but as a night terror. The night terror, or *pavor nocturnis*, is a sudden arousal from slow wave sleep (stage 3 or 4), usually within the first two hours of the commencement of the sleep period, accompanied by intense fear and autonomic arousal. Bodily movement is common, and the experience is typically devoid of any dream or imagery content, although some individuals report a single figure in the room or sitting on top of them (Hartmann, 1984). In the present study, however, the definition given to the participant was of an intense experience, accompanied by fear and screaming, which woke the participant in the middle of the night. No reference was given to any imagery content whatsoever. Given the finding that reporters of anomalous experiences have propensities for magical thinking, it is hypothesized that the participants interpreted the fear in terms of a threat, attributing a state of arousal to a external. as opposed to an internal cause. This reification of the subjective would lead to the ad hoc reasoning that if one awoke from sleep, afraid, with no remembrance of a nightmare, then the fear-causing stimulus must be real and present in the waking setting. Further elaboration of this attribution, in concert with the perceptual aberrations that can attend situations of diminished external reference,

could lead to the production of an ambiguous, threatening experience with a paranormal interpretation.

Beliefs and Subcultural Support

Despite the importance of factors such as having a potent fantasy life, being prone to alterations in perception, engaging in magical thought, having elevated scores on measures of psychopathology, or being prone to nocturnal disturbances such as sleep paralysis, these factors by themselves cannot adequately account for the production of anomalous experiences. It can account for the production of an hallucination, or a misperception, but the presence of a prior existing system of belief is required to assign the experience a paranormal or supernatural cause.

Patterns of support from the family for the reporter of the anomalous experience did not differ in frequency with regard to intensity of experience. Intensity groups did not differ significantly with regard to the type of family response the report of the experience garnered, although 56% of the low intensity and 71% of the high intensity groups reported that their family endorsed their belief that the experience was supernatural in nature. There were no significant differences between the two intensity groups with regard to whether members of their peer group reported similar experiences. Nevertheless, 86% of the low intensity group and 78% of the high intensity group reported that their peers supported or endorsed their experience, as

opposed to being dismissive or deriding.

With regards to reports of anomalous experiences, 80% of the low and 65% of the high intensity groups reported that their peer group had reported similar experiences. The difference between intensity groups with regards to whether a member of the family had an anomalous experience was not significant. However, the entirety of the high intensity and the majority (87%) of the low intensity group reported that a member of the family had reported an anomalous experience. Caution needs to be exercised when interpreting these results because of the nature of the variables. These variables were serendipitous in that they interviewee was not explicitly asked questions designed to elicit this data. As a result, this data pertains only to those who brought the topic up through the course of the interview. As a result, each group likely suffers from missing data. Further research in which the semi-structured interview asks specific questions about these experiences would allow a clarification

Remarkably, all reporters of anomalous experiences, despite differences of interpretation, type of experience and frequency of experiences reported a belief in ghosts. Amongst other beliefs in supernatural creatures or the belief that one has had mystical or diabolical experiences, belief in ghosts emerged as the strongest variable that discriminates reporters of anomalous experiences from

controls. There are two possible interpretations of this finding. Regardless of type of anomalous experience, the experience itself may have led to a "category" effect. Mahrer (1988) has argued that delusional systems of thought (in this case, belief that one has seen a ghost) are reactions to anomalous experiences. An interpretation of the event, and the credibility assigned it are reached in the same rational deductive manner as those interpretations of phenomena offered by scientists. In the case of the reporter of an anomalous experience, however, the delusional explanation wins out over the rational, because the delusional explanation fits the content of the experience. In the case of the scientist, after an explanation is deduced, the next step is to generalize the theory to other, similar phenomena. The reporter of the anomalous experience does this too, resulting in his/her endorsement of a wide range of paranormal beliefs based on the premise that they share an underlying cause, demonstrated to be true by at least one anomalous experience. Each participant reporting an anomalous experience may believe in ghosts as the result of this "ghostly" experience. This begs the question: "Which came first, the ghost, or the belief in ghosts?". In terms of beliefs about supernatural phenomena held prior to the anomalous experience, the majority of the low intensity group and the entirety of the high intensity group reported holding at least one paranormal belief prior to the

occurrence of the reported anomalous experience. This tends to indicate that the anomalous experience is embedded in matrix of prior supporting beliefs. A future study might compare those who report an anomalous experience, to those who do not, and those who have had longstanding beliefs in the supernatural but do not report an anomalous experience. This would allow a determination of the importance of a system of belief in the paranormal to the production of the anomalous experience.

Recommendations for Future Research

Several results of this study require additional clarification in order to understand the psychological variables associated with anomalous experiences. In terms of hallucinatory experience, it is clear that an individual may have an hallucination which is not deemed to be a ghost or a religious deity. A future study might look at the differences in prior paranormal beliefs for those who hallucinate, but ascribe a mundane explanation to the experience, and those who hallucinate ghosts and religious deities. In addition, it is quite possible that the paranormal experience itself is responsible for the belief system espoused in the interview by the reporter of the experience. It would seem that reporters of ghost experiences unanimously believe in ghosts. Nevertheless, the author recalls a participant who reported a fairly involved anomalous experience that included the presence of

a cross-like mark on the participants face, yet the participant had listed his religion as "atheist". When queried as to whether or not he would judge the experience to be religious in nature, the participant responded in the affirmative. It is possible that the experience of the apparition or religious figure causes a discrepancy in between the apparent content of the experience and its credibility and therefore the beliefs to which the participant subscribed prior to the experience. Thus, the move to resolve this discrepancy "converts" the experience, and results in the distortion of beliefs espoused prior to the experience to maintain and project a sense of consistency, or integrity to the experimenter. Future research needs to more fully address the question: "Which comes first, the belief or the paranormal experience"?

The relationship between sleep paralysis, the hypnagogic period, and night terrors needs to be explored further. The results of the present study were serendipitous, in that it would not have been predicted that a sleep disturbance typically unadorned with imagery such as the night terror would have been a significant factor in the anomalous experience. A future study might compare types of sleep related disturbances to determine the qualitative differences in the types of anomalous experiences which accompany them. It is possible that the type of anomalous experience that accompanies the night terror involves the

sensation of an menacing presence which is typically unseen but occasionally manifested as a shadow or sense of movement. The sleep paralytic anomalous experience would not involve an unseen menace, but rather a distinct figure which is perceived to cause the feeling of a weight on the chest, or troubles in breathing. Again, future studies need to compare not only controls with those reporting an anomalous experience, but to those who report one of the various types of sleep disturbances without assigning a paranormal interpretation.

In retrospect, there are changes which might have strengthened some of the results. In terms of the psychopathology factor, a better, more uniform measure could have replaced the series of measures from different sources. For example, the full MMPI-2 might have been employed in order to give a specific pattern of scoring. This may have allowed finer distinctions to be made between groups who reported anomalous experiences, and controls. In addition, a structured questionnaire would be employed to assess the participants anomalous experience. This questionnaire would have a section which allowed for the participant to write a description of the experience. This section would be followed by a series of questions regarding the experience, and systems of belief. In the analysis of the written protocols, text length (i.e., number of words) would be used as a covariate to control for differences in

writing or expository style. This would correct for any bias in interpretation that might occur because one participant is more verbose than another participant.

Summary

In conclusion, the present study demonstrated that reporters of anomalous experience differ from those who do not report anomalous experiences along several psychological dimensions. Participants reporting an anomalous experience tended to score higher on measures of psychopathology, the propensity for alterations in thought and perception, and imagination. Reporters of anomalous experiences can be broken into two distinct groups based on the intensity, or realism of the experience. A low intensity group was discriminated from a high intensity group and a control group on the basis of the propensity for alterations in thought and perception. Low intensity reporters tended to score higher than control and high intensity groups on this dimension. Low and high intensity groups were discriminated on the basis of low scores on a factor assessing propensities for alteration in thought and high scores on measures of imaginative involvement and psychopathology. It is hypothesized from these findings that low intensity experiences are typically misperceptions made under situations of diminished external reference, (i.e the dark of night) are sleep related, and are relatively static and ambiguous, lacking realism. High intensity experiences, on

the other hand, are complex fantasy productions which are dynamic, highly realistic and convincing. High intensity experiences are relatively unrelated to misperception, and due to their relationship to dimensions of psychopathology and imaginative involvement, may be distinct hallucinations.

Sleep variables which discriminated between the control and anomalous experience reporting groups included sleep paralysis, and the tendency to have night terror experiences after the age of twelve. Tentatively, it is hypothesized that although the majority of people reporting a sleep paralysis episode do not offer explanations for the event couched in terms of the paranormal, sleep paralysis may be a specific etiology for a significant number of anomalous experiences, a proposal similar to folk explanations for the sleep paralytic experience (Hufford, 1988; Siegel, 1992).

It is clear that anomalous experiences for low and high intensity groups were couched in a matrix of prior supporting beliefs. The vast majority of reporters of anomalous experiences, regardless of intensity had relatives and members of their peer group who not only reported similar experiences, but who had anomalous experiences of their own. As well, the vast majority of those who reported anomalous experiences received positive support or validation of the experience from a family member or a peer. Finally, reporting groups differed remarkably from the

controls in their belief in ghosts. Overall, the present results have added to the body of knowledge associated with understanding the characteristics of those who report anomalous experiences, as well as empirical support for earlier theories of hallucinatory experience. Despite the increment in the understanding of anomalous experiences that this study represents, substantial work remains, to clarify this complex area.

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Table 1 A

Means, Standard Deviations, and Range of Scores for the
Control Group

Variable	Mean	Std Dev	Minimum	Maximum	N
PAVORNO2	.12	.39	0	2	49
SEXAB1	.20	.71	0	3	54
PAVORNO1	.20	.54	0	3	49
SEXAB2	.24	.64	0	3	54
PHYSAB2	.28	.63	0	2	54
PPI_PA	.29	.23	.00	.75	54
PPI_XT	.30	.14	.02	.69	54
PHOB_ANX	.31	.51	.00	2.28	54
EMOTAB1	.39	.49	0	1	54
CURSS_CA	.39	.75	0	3	51
PHYSAB1	.41	.86	0	3	54
PPI_LB	.41	.22	.00	.88	54
SOMATIZE	.58	.51	.00	1.83	54
ANXIETY	.63	.64	.00	2.30	54
CURSS_OI	.86	1.48	0	6	51
OBBSCOMP	.89	.74	.10	3.00	54
CURSS_O	2.67	1.93	0	7	51
PRCPT_AB	2.96	3.62	0	17	54
CURSS_S2	3.59	3.82	0	16	51
CURSS_S1	4.92	4.20	0	16	51
MMPI_SC	13.79	8.29	2	37	53
C_MARLOW	14.62	5.24	3	28	53
DEQ	14.74	14.18	1	65	54
DIABOLIC	15.43	17.39	0	61	54
F_PRONE	18.09	6.74	6	31	55
AGE	25.29	8.78	19	53	56
ABSORPT	66.62	17.73	26	102	52
BETTS	67.58	16.67	25	100	50
PHYSIOGN	79.39	20.03	32	129	54
HOOD_MYS	82.96	24.47	40	131	54

Table 1 B

Means Standard Deviations and And Range of Scores for Low Intensity Group

Variable	Mean	Std Dev	Minimum	Maximum	N
PHYSAB2	.15	.44	0	2	34
SEXAB2	.21	.59	0	3	34
PHYSAB1	.24	.66	0	3	33
PHOB_ANX	.30	.46	.00	2.00	34
PAVORNO2	.31	.47	0	1	29
EMOTAB1	.35	.49	0	1	34
SEXAB1	.38	.85	0	3	34
PPI_PA	.40	.25	.00	.75	34
PPI_XT	.41	.15	.15	.77	34
PAVORNO1	.48	.63	0	2	29
PPI_LB	.58	.24	.11	1.00	34
CURSS_CA	.59	1.16	0	6	32
SOMATIZE	.91	.60	.00	2.42	34
ANXIETY	.96	.68	.00	2.80	34
OBBSCOMP	1.23	.66	.20	2.50	34
CURSS_OI	1.44	1.63	0	5	32
CURSS_O	2.81	1.86	0	7	32
PRCPT_AB	5.12	5.77	0	21	34
CURSS_S2	5.88	4.90	0	19	32
CURSS_S1	7.30	4.84	0	18	33
C_MARLOW	13.97	4.68	5	22	33
MMPI_SC	17.61	9.66	4	47	33
DEQ	19.94	16.17	2	56	34
AGE	20.48	5.56	17	47	33
F_PRONE	23.39	7.45	8	40	33
DIABOLIC	27.85	19.73	0	67	34
BETTS	65.81	19.55	10	97	32
ABSORPT	76.32	20.12	44	113	34
PHYSIOGN	84.65	17.77	49	125	34
HOOD_MYS	87.12	23.72	11	137	34

Table 1 C

Means, Standard Deviations and Range of Scores for High Intensity Group

Variable	Mean	Std Dev	Minimum	Maximum	N
SEXAB2	.27	.70	0	3	22
SEXAB1	.32	.72	0	2	22
PPI_PA	.35	.26	.00	.75	22
EMOTAB1	.41	.50	0	1	22
PHYSAB1	.41	.85	0	3	22
PPI_XT	.42	.13	.13	.67	22
PAVORNO2	.52	.60	0	2	21
PHYSAB2	.55	1.01	0	3	22
PAVORNO1	.57	.60	0	2	21
PHOB_ANX	.60	.58	.00	1.86	20
PPI_LB	.68	.14	.55	1.00	22
CURSS_CA	1.19	1.47	0	4	21
SOMATIZE	1.28	.69	.25	2.75	20
ANXIETY	1.29	.72	.20	3.20	20
OBBSCOMP	1.46	.64	.30	2.70	20
CURSS_OI	2.00	1.95	0	6	21
CURSS_O	3.05	2.18	0	7	21
PRCPT_AB	5.32	4.91	0	16	19
CURSS_S2	7.10	5.88	0	17	21
CURSS_S1	8.29	5.71	0	17	21
C_MARLOW	13.82	5.04	5	25	22
AGE	19.45	.86	18	22	22
DIABOLIC	21.52	18.32	0	54	21
MMPI_SC	21.86	9.29	9	42	22
F_PRONE	25.55	7.25	15	42	22
DEQ	27.10	16.61	4	78	21
BETTS	69.95	13.20	43	93	21
PHYSIOG	80.90	14.55	61	111	20
HOOD_MYS	87.32	22.90	43	145	22
PHYSIOGN	96.23	20.54	62	141	22

Table 2

Factor Loadings: Varimax Rotation, 5 Factors Extracted by
Principle Axis Factoring

Factors					
	PSYCH-F	HYPNO-F	PAT-P-F	ABUSE-F	IMAGE-F
Measures					
ABSORP	.23779	.17417	.42848	-.04511	.63589*
ANXIETY	.79475*	-.06647	.26286	.07184	.21656
CURSS_CA	.05254	.67000*	-.13018	.29018	.22509
CURSS_O	.02137	.83834*	.03953	.11757	.13857
CURSS_OI	.07545	.90131*	.06400	-.03930	.04863
CURSS_S1	.01557	.86261*	.32435	.00730	.08380
CURSS_S2	.07968	.93273*	.22301	-.06982	.07630
DEQ	.57183*	.10598	.55619	.07090	.02864
EMOTAB1	.22001	.03552	-.05585	.66361*	-.00751
F_PRONE	.15919	.16143	.44987	.14915	.61989*
INT_SENS	.76999*	-.03146	.20501	.01066	.17281
MAG_THNK	.38514	.09609	.69303*	.09186	.30209
MMP1_SC	.71389*	.12927	.51032	.08623	.00925
OBBSCOMP	.79856*	.02916	.22255	.07667	.09340
PHOB_ANX	.70990*	.03846	.04181	.07218	.24335
PHYSAB1	.07022	-.01764	-.00917	.75397*	.20514
PHYSAB2	.29757	.24918	-.02657	.72600*	-.05144
PHYSIOGN	.17929	.18934	.01858	-.03239	.73136*
PPI_LB	.11194	.17444	.47513*	-.09160	.37257
PPI_PA	.02103	.06064	.74463*	.09735	.04838
PPI_XT	.34472	.11951	.74470*	.07192	.29084
PRCPT_AB	.42850	.08859	.72678*	.02733	-.01882
RBERG_3	-.69758	-.16468	.04794	.08517	.09867
SEXAB1	-.20062	-.05657	.26054	.69408*	-.04364
SEXAB2	-.13859	.10212	.12144	.76248*	-.09520
SOMATIZE	.64662*	.03574	.36311	.09370	.29585

Legend: Factor Abbreviations

PSYCH-F: PSYCHOPATHOLOGY FACTOR

HYPNO-F: HYPNOTIZABILITY FACTOR

PAT-P-F: PROPENSITIES FOR ALTERATION IN THOUGHT AND PERCEPTION FACTOR

ABUSE-F: PHYSICAL/SEXUAL/EMOTIONAL ABUSE FACTOR

IMAGE-F: IMAGINATIVE INVOLVEMENT FACTOR

Note: '*' designates the highest loading of the measure

Table 3

MANOVA Summary: Group and Gender By FactorsMultivariate F-Tests of Significance (Pillais)

	Value	F	Hypo. DF	Error DF	p
Gender	.14	2.80	5.00	84.00	.021
Condition	.27	2.70	10.00	170.00	.004
Group X Gender	.068	.59	10.00	170.00	.816

Univariate F-tests For Gender

Var.	Hypo. SS	Error SS	Hypo. MS	Error MS	F	p
ABUSE_F	41.84	1160.37	41.84	13.18	3.17	.078
HYPNOF	121.05	1226.32	121.05	13.93	8.68	.004**
IMAGEF	1.10	430.25	1.09	4.88	.22	.637
PAT-F	.46	596.35	.46	6.77	.06	.796
PSYCHF	17.45	2184.87	17.45	24.82	.70	.404

Univariate F-Tests for Condition

Var.	Hypo. SS	Error SS	Hypo. MS	Error MS	F	p
ABUSE_F	1.21	1160.36	.61	13.19	.046	.955
HYPNOF	43.49	1226.32	21.74	13.94	1.56	.216
IMAGEF	60.38	430.25	30.19	4.89	6.18	.003**
PAT-P	172.23	596.36	86.11	6.78	12.70	.000***
PSYCHF	297.01	2184.88	148.51	24.83	5.98	.004**

Univariate F-tests Condition X Gender

Var	Hypo. SS	Error SS	Hypo. MS	Error MS	F	p
ABUSE_F	23.09	1160.37	11.55	13.16	.88	.420
HYPNOF	34.70	1226.33	17.35	13.94	1.24	.293
IMAGEF	2.21	430.25	1.11	4.89	.23	.798
PAT-P	1.13	596.35	.56	6.73	.09	.920
PSYCHF	9.15	2184.88	4.58	24.83	.19	.832

Note: '***' means significance at less than .01

'****' means significance at less than .001

PM-1 3½"x4" PHOTOGRAPHIC MICROCOPY TARGET
NBS 1010a ANSI/ISO #2 EQUIVALENT

PRECISIONSM RESOLUTION TARGETS

Table 4

Discriminant Function Analysis Summary: FactorsCanonical Discriminant Functions

After Fcn	Wilks' Lambda	Chi Sq.	df	p
0	.675311	34.94	10	.0001 **
1	.924862	6.95	4	.1385

Fcn	Eigenvalue	Pct of Variance	Cum Pct	Canonical Corr
1*	.3695	81.98	81.98	.5194
2*	.0812	18.02	100.00	.2741

Standardized Canonical Correlation Coefficients

	Function 1	Function 2
Factor		
ABUSE_F	-.07056	.05112
HYPNOF	.25169	.25233
IMAGEF	.10911	.64667*
PAT_P-F	.73618**	-1.09912**
PSYCHF	.17635	.72128*

Note: *Function 1 is defined primarily by high scores on the PAT-P Factor.

*Function 2 is defined by low scores on the PAT-P Factor, and High Scores on the Imaginative Involvement and Psychopathology Factors.

*Note: Function 1 discriminates between the Control and both Intensity groups.

Function 2 discriminates between the Low and High Intensity Groups

Canonical discriminant functions: evaluated at group means (group centroids)

Group	Function 1	Function 2	
0	-.59705	.06082	Control Group
1	.43453	-.35535	Low Intensity Group
2	.80158	.43682	High Intensity

Table 5

MANOVA Summary for Group x Gender X Sleep VariablesMultivariate Tests of Significance (Pillais)

	Value	F	Approx. DF	Error DF	p
Gender	.05	.99	5.00	85.00	.423
Condition	.19	1.79	10.00	172.00	.066***
Gender X Group	1.65	10.00	172.00	.097	.35

Univariate F-tests: Gender X Group

Var	Hypo. SS	Error SS	Hypo. MS	Error MS	F	p
HYPNAGOG	1.10	82.57	.55	.93	.59	.552
PARALYSI	1.05	17.89	.52	.20	2.63	.077
PAVORNO1	1.60	28.75	.80	.32	2.48	.089
PAVORNO2	.01	19.29	.00	.22	.00	.997
HYPNOPOP	.91	89.70	.45	1.00	.45	.637

Univariate F-tests: Gender

Var	Hypo. SS	Error SS	Hypo. MS	Error MS	F	p
HYPNAGOG	1.17	82.57	1.17	.92	1.26	.263
PARALYSI	.00	17.89	.00	.20	.03	.853
PAVORNO1	.05	28.75	.05	.32	.15	.694
PAVORNO2	.24	19.29	.24	.21	1.12	.292
HYPNOPOP	.35	89.70	.35	1.00	.34	.556

Univariate F-tests: Group

Var	Hypo. SS	Error SS	Hypo. MS	Error MS	F	p
HYPNAGOG	6.44	82.58	3.21	.93	3.46	.035*
PARALYSI	.32	17.89	.15	.21	.79	.456
PAVORNO1	.96	28.76	.47	.32	1.47	.235
PAVORNO2	2.04	19.29	1.01	.21	4.69	.011**
HYPNOPOP	1.62	89.71	.81	1.01	.80	.450

*= Significant at the .05 level of probability

**= Significant at the .01 level of probability

***=approached significance

Table 6

Discriminant Function Analysis Summary: Sleep VariablesCanonical Discriminant Functions

Fcn	Eigenvalue	Pct of Variance	Cum Pct	Canonical Corr
1	.935070	6.109	74.91	.1911
2*	.0694	25.09	100.00	.2548

After Fcn	Wilks' Lambda	ChiSq.	Df	p
0	.774485	23.256	10	.0098**
1*	.2073	4.91	4	.4144

Standardized canonical discriminant function coefficients

	Function 1	Function 2
HYPNAGOG	.16281	.64020
HYPNOPOP	-.15052	.31717
PAVORNO1	.11998	.54714
PAVORNO2	.71873	-.36794
PARALYSI	.50391	-.63738

Canonical discriminant functions evaluated at group means (group centroids)

Group	Func 1	Func 2
0	-.38009	-.14747 Control Group
1	.07447	.39186 Low Intensity
2	.78524	-.22164 High Intensity

Table 7

MANOVA Summary: Group X Gender X Belief VariablesMultivariate F-Tests of Significance (Pillais)Multivariate F

	Value	F	DF	Df	p
Gender	.06	.98	6.00	94.00	.445
Condition	.54	5.79	12.00	190.00	.000 **
Group x Gender	.08	.64	12.00	190.00	.807

Univariate F-Tests for Gender

Var	Hypo. SS	Error SS	Hypo. MS	Error MS	F	p
ANGEL_BL	0.34	22.09	.034	.22	.15	.69
GHOST_BL	.01	10.97	.015	.11	.14	.71
GOD_BL	.003	16.08	.003	.16	.02	.88
HOOD	385.66	57472.14	385.66	580.52	.66	.42
DEVIL BL	.470	21.14	.47	.21	2.18	.14
DIABOLIC	915.680	33449.81	915.68	337.87	2.71	.10

Univariate F-tests for Condition

Var	Hypo. SS	Error SS	Hypo. MS	Error MS	F	p
ANGEL_BL	2.17	22.08	1.08	.22	4.85	.010**
GHOST_BL	10.39	10.96	5.19	.11	46.91	.000**
GOD_BLF	1.00	16.07	.50	.16	3.08	.050*
HOOD	592.76	57472.13	296.38	80.52	.51	.602
DEVIL BL	4.90	21.14	2.45	.21	11.47	.000**
DIABOLIC	3399.15	33449.81	1699.57	337.87	5.03	.008**

Univariate F-tests for Group X Gender

Var	Hypo. SS	Error SS	Hypo. MS	Error MS	F	p
ANGEL_BL	.42	22.08	.21	.22	.94	.393
GHOST_BL	.05	10.97	.03	.11	.23	.793
GOD_BLF	.55	16.07	.27	.16	1.69	.190
HOOD	339.57	57472.19	199.78	580.53	.34	.71
DEVIL BL	.42	21.14	.21	.21	.99	.374
DIABOLIC	439.08	33449.85	219.54	337.88	.65	.524

Note: A summary for variable names and abbreviations is found in Appendix

Legend: '*' means significance at .05

'**' means significance at less than .01

Table 8

Discriminant Function Analysis Summary: BeliefsCanonical Discriminant Functions

After Fcn	Eigenvalue	Pct of Var	Cum Pct	Canonical Corr
1*	1.2455	98.22	98.22	.7448
2*	.0226	1.78	100.00	.1486

Fcn	Wilks' Lambda	Chi.Sq	df	p
0	.435488	83.545	12	.0000*
1	.977903	2.246	5	.8142

Standardized canonical discriminant function coefficients

	Function 1	Function 2
ANGEL_BL	-.16687	.40023 **
DEVIL_BL	.17027	-.14466
DIABOLIC	.19093	.89858 ***
GHOST_BL	.95399**	-.22629
HOOD_MYS	-.02130	-.48375 **
GOD_BLF	.04467	-.06639

Canonical discriminant functions evaluated at group means
(group centroids)

Group	Function 1	Function 2
0	-1.09991	.00297 Control Group
1	1.12320	.15365 Low Intensity Group
2	1.05823	-.28324 High Intensity Group

Table 9

MANOVA Summary: Group X Gender X Abuse VariablesMultivariate F-Tests of Significance (Pillais)

	Value	F	Hypo DF	Err DF	p
Gender	.08093	.82	5.00	47.00	.536
Condition	.05382	.53	5.00	47.00	.749
Group x Gender	.07841	.79	5.00	47.00	.555

Univariate F-tests for Condition X Gender

Variable	Hypo. SS	Error SS	Hypo. MS	Error MS	F	p
PHYSAB1	.79	42.49	.79	.83	.95	.333
PHYSAB2	1.37	52.55	1.37	1.03	1.33	.253
EMOTAB1	2.78	51.01	2.78	1.00	2.77	.102
SEXAB1	.52	55.49	.52	1.08	.48	.491
SEXAB2	.00	47.25	.01	.92	.00	.968

Univariate F-tests for Gender

Variable	Hypo. SS	Error SS	Hypo. MS	Error MS	F	p
PHYSAB1	.92	42.49	.92	.83	1.11	.296
PHYSAB2	2.90	52.55	2.90	1.03	2.81	.099
EMOTAB1	2.10	51.01	2.10	1.00	2.10	.153
SEXAB1	.61	55.49	.61	1.08	.56	.456
SEXAB2	2.48	47.25	2.48	.92	2.67	.108

Univariate F-tests For Condition

Variable	Hypo. SS	Error SS	Hypo. MS	Error MS	F	p
PHYSAB1	.01	42.49	.00	.83	.01	.969
PHYSAB2	.70	52.55	.70	1.03	.68	.411
EMOTAB1	.53	51.01	.53	1.00	.53	.468
SEXAB1	.58	55.49	.58	1.08	.54	.466
SEXAB2	.01	47.25	.01	.92	.01	.968

Note:

Please see Appendix E for a summary of Variable Abbreviations

Table 10

Table 10

Factorial Anova Summary for Group Differences on Social Desirability

Source of Var.	Sum of Squares	DF	Mean Square	F	p
Main Effects					
Group	32.580	3	10.860	.424	.736
Gender	10.085	2	5.042	.197	.822
	27.812	1	27.812	1.085	.300
2-Way Interactions					
GROUP x GENDER	11.642	2	5.821	.227	.797
<hr/>					
Explained	84.523	5	16.905		.659 .655
Residual	2589.066	101	25.634		
Total	2673.589	106	25.223		

** Neither the Interaction, nor the Main Effects reached significance.

Table 11

Frequency of Endorsement of Intensity Items

Item	Low Intensity		High Intensity	
	N	%	N	%
Emotion	31	91	20	91
Figure1	19	56	18	82
Movement	22	65	21	96
NV Comm.	08	24	08	36
Speech	01	03	13	59
Form:				
transparent	03	09	01	05
Translucent	05	15	01	05
Solid	13	38	18	82
Senses:				
One	01	03	02	09
Two	07	21	02	09
Three	17	50	02	09
Four	09	27	16	73

Note: Senses Item: One=One sense, excluding sight; Two=Two Senses, excluding sight or sight/sound; Three=Sight and another sense, excluding sound; Four=Sight and Sound

Table 13

Means and Standard Deviations For Factors, Belief Variables, and Sleep Variables

Factor	Control			Low Intensity			High Intensity		
	M	S.D	N	M	S.D.	N	M	S.D.	N
ABUSE_F	-1.87	5.17	53	-0.33	3.35	33	0.17	3.39	22
HYPNOF	-1.78	2.42	54	0.20	3.70	32	1.23	1.86	19
IMAGEF	-1.34	3.41	51	0.24	2.52	33	1.32*	1.95	20
PSYCHF	-1.14	2.12	52	0.31	5.40	33	1.61*	5.46	21
PAT-P	-0.07	4.01	54	0.94*	3.43	34	3.36*	5.04	20

Variable	Control			Low Intensity			High Intensity		
	M	S.D.	N	M	S.D.	N	M	S.D.	N
DEVIL_BL	.26	.44	54	.71*	.46	34	.65*	.49	20
GHOST_BL	.30	.46	54	.79*	.41	34	.70*	.47	20
ANGEL_BL	.48	.50	54	.88*	.33	34	.85*	.37	20
GOD_BLF	.70	.46	54	1.00*	.00	34	1.00*	.00	20
DIABOLIC	15.43	17.39	54	27.85*	19.73	34	21.52*	18.32	21
HOOD_MYS	82.96	24.47	54	87.12	23.72	34	87.32	22.90	22

Variable	Control			Low intensity			High Intensity		
	M	S.D.	N	M	S.D.	N	M	S.D.	N
PAVORNO2	.12	.39	49	.28	.45*	29	.52*	.60	21
PAVORNO1	.20	.54	49	.31	.47*	29	.55*	.51	20
PARALYSI	.27	.45	49	.48	.63*	29	.57*	.60	21
HYPNAGOG	1.33	.99	49	1.79	1.11	29	1.62	.86	21
HYPNOPOP	1.38	.99	50	1.83	.93	29	1.71	.90	21

Note: '*' denotes means which differed significantly from other means in the same row.

Appendix A

Sleep Experiences-Anomalous Experiences Screening Questionnaire Used in Mass Testing (From McNulty (1993))

Name: _____ Student Number: _____
Phone Number: _____ Male: _____ Female: _____ Age: _____

The following questions ask about experiences that occur while people are falling asleep or waking up. All of these experiences occur in normal individuals and none, in and of themselves, are symptoms of psychopathology. Please read each question carefully before answering.

Have you had an experience similar to the one described below?

I was falling asleep, but was still awake when I discovered that I felt paralysed and could not move. However, I could open my eyes and look around the room. I was not dreaming because I could see the actual room that I was in from the perspective where I was lying.

During the core experience described above one or more of the following may have occurred. Not everyone has all of the following experiences.

- 1) I felt the presence of someone in the room with me even though I could not see anybody.
- 2) I saw someone or something in the room with me. What I saw appeared to be a formed being (the characteristics of this being differ from person to person, others have seen an animal, demon, "monster", or blob).
- 3) I felt a pressure on my chest as if someone was pushing me down or sitting on my chest.
- 4) I felt like my body floated upwards into the air.

In answering the following question remember that you need not have all of the experiences listed above in order to answer affirmatively.

I have had an experience similar to this:

- 1) Never. If you have never had an experience like this go to question #27 and answer this question and all of the questions following it.
- 2) Once
- 3) Two to five times
- 4) More than five times

If you answered #2, #3 or #4 to the above question, please answer all of this questionnaire. If you have had an experience like this one or more times, which of the following characterized your last experience?

- 2) Were you awake? Could you actually see the room from

- the perspective where you were lying?
- YES _____ NO _____
- 3) Did you feel a presence of someone in the room?
YES _____ NO _____
- 4) Did you see a person or thing in the room?
YES _____ NO _____
- 5) Did you feel a pressure on your chest?
YES _____ NO _____
- 6) Did you hear a sound something like footsteps?
YES _____ NO _____
- 7) Did you hear your name being called?
YES _____ NO _____
- 8) Did you feel like someone or something touched you?
YES _____ NO _____
- 9) Did you see someone or something pushing or sitting on your chest?
YES _____ NO _____
- 10) Were you afraid during this experience?
YES _____ NO _____
- 11) Did you feel your body floating upward into the air?
YES _____ NO _____
- 12) Which position where you lying in when this occurred?
a) on my back
b) on my stomach
c) on my side
d) sitting in a chair
- 13) Did this experience occur when you were:
a) falling asleep
b) waking up
- 14) What was the approximate date of your most recent experience?
_____ month _____ date _____ year
- 15) If you were just falling asleep, how long were you in bed before the experience occurred? _____
- 16) If you were just waking up, how long had you been asleep? _____
- 17) At what time did this experience occur? _____
- 18) How long did this experience last in minutes? _____
- 19) The night before this experience, did you feel:
Stressed:
a) Not at all b) Slightly c) Somewhat d) Severely
Overworked:
a) Not at all b) Slightly c) Somewhat d) Severely
Tired:
a) Not at all b) Slightly c) Somewhat d) Severely
- 20) How old were you when you first had this experience? _____
- 21) Did the experience end when you were able to move a

finger or another extremity?

- 22) Did you hear any unusual sounds? YES ____ NO ____
 YES ____ NO ____

Explain: _____

- 23) Did you see anything unusual? YES ____ NO ____

Explain: _____

- 24) Did you have any unusual body sensations? YES ____ NO ____

Explain: _____

- 25) Do you know of any other family members who have had and experience like the core experience described above?

YES ____ NO ____ What relation
 are they to you (for example; mother, sister etc.)

- 26) What do you think caused you to have an experience like the core experience described above?

- 27) Before and including the age of 12, how often did you talk in your sleep?

a) Never
 b) Once per week or less
 c) More than once a week but not nightly
 d) Nightly

- 28) After the age of 12, how often did you talk in your sleep?

a) Never
 b) Once per week or less
 c) More than once a week but not nightly
 d) Nightly

- 29) Before the age of 12, how often did you walk in you sleep?

a) Never
 b) Once per week or less
 c) More than once a week but not nightly
 d) Nightly

- 30) After the age of 12, how often did you walk in your sleep?

a) Never
 b) Once per week or less
 c) More than once a week but not nightly
 d) Nightly

- 31) Have you ever had nightmares that awoke you suddenly from sleep and you could remember the nightmare
 a) Never

- b) Once per week or less
 - c) More than once a week but not nightly
 - d) Nightly
- 32) Before and including the age of 12 did you ever sit up in bed screaming even though you were asleep (night terrors)?
- a) Never
 - b) Once per week or less
 - c) More than once a week but not nightly
 - d) Nightly
- 33) After the age of 12, did you ever sit up in bed screaming even though you were asleep (night terror)?
- a) Never
 - b) Once per week or less
 - c) More than once a week but not nightly
 - d) Nightly
- 34) Have you ever been diagnosed with narcolepsy?
- YES _____ NO _____
- 35) Have you ever had the experience of being asleep and during the dream realize that you are dreaming?
- YES _____ NO _____
- 36) Have you ever had the experience of being paralysed either while falling asleep or while waking up?
- YES _____ NO _____
- 37) Have you ever had the experience of leaving your body and floating upwards so when you look down you can see your body below you?
- YES _____ NO _____
- 38) How vivid are your dreams:
- a) Not vivid
 - b) Slightly vivid
 - c) Somewhat vivid
 - d) Extremely vivid
- 39) While falling asleep, do you have vivid dreamlike imagery?
- a) Never
 - b) Rarely
 - c) Sometimes
 - d) Frequently
- 40) While waking up from sleep, do you have vivid dreamlike imagery?
- a) Never
 - b) Rarely
 - c) Sometimes
 - d) Frequently
- 41) How well do you remember your dreams the next day?
- a) Not at all
 - b) Poorly
 - c) Fairly well
 - d) Very well
- 42) Have you ever seen a U.F.O.?
- YES _____ NO _____

- 43) How long do you usually sleep per night? _____
- 44) Have you ever experienced sudden intense fear of dying and a feeling of impending doom along with one or more of these symptoms: dizziness, choking, trembling, palpitations, chest pain, sweating? (In other words a panic attack)?
- a) Never
 - b) Once
 - c) 2-5 times
 - d) More than five times
- 45) Do you have severe headaches?
- a) Never
 - b) Once per month or less
 - c) More than once a month but less than once per week
 - d) More than once per week
- 46) Have you ever been diagnosed as having migraine headaches?
- YES _____ NO _____
- 47) If yes, how often do you have migraine headaches?
- a) Once per year
 - b) More than once per year but less than once per month
 - c) More than once per month but less than once a week
 - d) More than one per week
- 48) Have you ever seen or been contacted by a ghost/spirit?
- YES__ NO__
- 49) If yes, then # of times _____
- 50) Have you ever seen or been contacted by a religious deity?
- YES__ NO__
- 51) If yes, then # of times _____
- 52) Have you ever been abducted or contacted by a UFO_Alien(s)
- YES__ NO__
- 53) If yes, then # of times _____

Appendix B**Informed Consent Form**

The purpose of this informed consent form is to insure that you understand the purpose and nature of this study, and what your involvement entails.

Research Personnel. The following people are involved in this research project and may be contacted at any time: Jason Ramsay (Principal Investigator, 788-2600, ext 2683), Dr. Nicholas Spanos (faculty sponsor, 788-2600, ext 2684). If you have any ethical concerns regarding this study, please contact Kim Matheson (Chair, Dept. of Psychology Ethics Committee) or Dr. W. Jones (Chair, Dept. of Psychology, 788-2600, ext 2648).

This study involves filling out a number of paper and pencil questionnaires, in order to measure various aspects of personality, as well as participating in a session designed to measure your hypnotizability. The data and transcripts of your sessions will only be available to the researchers associated with this project. As well, you may be asked to take part in a structured interview, which will be recorded for transcription.

I have read and understood the above statement, and understand that I have the freedom and right to withdraw from this study at any time without question or reprimand by the investigator or the university, and without loss of course credit.

Participant's Name

Signature of participant

Date

Researcher's Name

signature of researcher

Appendix C**Religious Background and Supernatural Beliefs Questionnaire**

- 1) What is your present religious affiliation?

- 2) Is your present affiliation different than the one with which you were raised? _____
 - 2a) If yes, what was the religious affiliation you were raised with? _____
 - 2b) What was the reason for your change of religion?

 - 2c) Have you changed your religious affiliation more than once? _____
- 3) To what extent do you practice your religion (i.e. go to a church, synagogue, mosque, temple, or organized religious service or meeting?)

Please circle one:
 - (a) more than once a week
 - (b) once a week
 - (c) once a month
 - (d) at least once every six months
 - (e) once a year
 - (f) less than once a year
 - (g) never
- 4) How frequently do you engage in prayer?
 - (a) at least once a day
 - (b) more than once a week
 - (c) once a week
 - (d) once every two weeks
 - (e) once a month
 - (f) rarely
 - (g) never

5) How central would you say your religious beliefs are to your daily activities?

- (a) My daily activities are at all times guided by my religious beliefs.
- (b) More often than not, my religious beliefs guide my daily activities.
- (c) I call upon my religious beliefs occasionally during my daily activities.
- (d) Only during stressful events do I call upon my religious beliefs to guide my actions.
- (e) During stressful events, I may or may not call upon my religious beliefs to guide my actions.
- (f) Even during extremely stressful events (such as life threatening situations, death of a loved one, etc.) I will rarely call upon my religious beliefs to guide my actions.
- (g) At no time will I call upon religious beliefs to guide my actions.

6) How frequently do you engage in prayer?

- (a) at least once a day
- (b) more than once a week
- (c) once a week
- (d) once every two weeks
- (e) once a month
- (f) rarely
- (g) never

Please circle YES or NO for the following questions

7)	Do you believe in a god or a supreme deity?	Yes	No
8)	Do you believe in demons, or devils?	Yes	No
9)	Do you believe in angels?	Yes	No
10)	Do you believe in ghosts?	Yes	No

Appendix D

Semi-Structured Interview

- 1) -Tell me about the experience itself. Give me as much detail as possible as to where the event occurred, under what conditions, when it occurred, whether there were other witnesses, were there any sounds, etc.
- 2) - Please Describe in as much detail as you can what the entity looked like.
- 3) - If the event was one in which contact was made, give me as much material as to the shape of the entity(ies) (ghost, saint, etc), what its(their) general features were, how many there were etc. Was there an attempt at communication made on their part? On your part? If so, to what degree was this attempt successful? What did they tell you? Did they explain their purpose in contacting you and other humans? If they did not reveal their purpose to you, what did you think their purpose is?
- 4) -What was the setting in which the event occurred? Was the ghost or entity transparent, translucent, opaque or solid? Were there any alterations of the surrounding environment? If so how was the environment altered? Was the quality or intensity of the light altered by the appearance of the apparition?
- 5) -Have you had any experiences since which relate to what was experienced then? (ie. a sense of being in touch with them somehow?)
- 6) -after the incident, did you experience the sense of missing time? Vivid dreams about it? Bad headaches? Any other physical disturbances?
- 7) -Are you involved in a group that revolves around the type of supernatural experience you had?
- 8) -Why do you think they made contact with you?
- 9) -What do you think are the implications of the ghost's existence (and of their purpose) for your own life and your religious beliefs?
- 10) -Do you fear the ghosts or entities? Do you think that they will come back or contact you again?
- 11) -Have you done much reading or other research into this topic?
- 12) Had you read any material related to the experience prior to the experience?

Appendix E

Summary of Scales and Abbreviations

- Inventory of Childhood Memories and Imaginings (ICMI: Fantasy Proneness)
- Tellegen's Absorption Scale (TAS) (Absorpt)
- Hood's Mysticism Scale
- Curss Subscales:
 - CA: Continuous Amnesia
 - O: Overt Score
 - OI: Objective Involuntariness
 - S1: Subjective experience measure
 - S2: Subjective experience measure
- Betts Imagery scale
- Personal Philosophy Inventory (PPI)
- Combined Magical Thinking and Perceptual Aberration Scales (Prcpt_Ab; Mag_thnk)
- Rosenberg Self-Esteem Scale (RSE) (Rberg_3)
- Religious Attitudes Questionnaire:
 - Ghost_B1: Belief in ghosts
 - Devil_B1: Belief in devils
 - Angel: Belief in angels
 - God bl: Belief in God
- MMPI Schizophrenia Sub-scale (MMPI Sc)
- Sleep Experiences Questionnaire:
 - Pavor1= Night terrors before 12 yrs old
 - Pavor 2= Night terrors after 12yrs old
 - Hypnopompia: Hypnopop
 - Hypnagogia: Hypnagog
 - Sleep Paralysis: Paralysis
- Physiognomic Cue Test (PCT) (Physiogn)
- Marlow Crowne Social Desirability Inventory
- Portions of the symptom Checklist 90-Revised (SCL-90R) including
 - Somatization: Somatize
 - Obsessive Compulsivity: Obb_Comp
 - Anxiety: Anxiety
 - Phobic Anxiety: Phob_Anx
- Dissociative Experiences Scale (DES)
- Diabolical Experiences Questionnaire (DEQ)
- Major Events Inventory (MEI)
 - Emotab1: Emotional Abuse
 - Physab1: Physical Abuse Before 16 years old
 - Physab2: " " After 16 years
 - Sexab1: Sexual Abuse before 16 years old
 - Sexab2: Sexual Abuse after 16 years old
- Carleton University Responsiveness to Suggestion Scale (CURSS)

Appendix F

Debriefing

There has recently been a burgeoning fascination with reports of UFOs, as well as a rising number of incidence of people who claim to have been abducted by aliens. There is also an equal, if not greater, incidence of reports of ghost sightings and contacts, as well as reports of visitation by deities.

This study was interested in drawing comparisons between people who reported seeing ghosts, deities or aliens, and people who served in a control condition. Comparisons will be based on the paper and pencil questionnaires you completed, which measured various facets of personality, the Hood Mysticism Scale, which indicates whether you have had a mystical experience, and a measure hypnotizability. It was hypothesized that the reporting conditions would differ from the non-reporting conditions on a level of hypnotizability, absorption (imaginative involvement), sleep disorders, experiences prior to sleep, dream style, measures of personality, and would have different underlying beliefs about the supernatural prior to their experience.

We would like to thank you for participating in this research. Your time and efforts are greatly appreciated!

If you have any questions or comments regarding this research, feel free to contact either Jason Ramsay (Principle Investigator) at 788-2600, ext. 2683, or Dr. Spanos (Faculty Sponsor) at 788-2600, ext. 2684. If you have any ethical concerns, please contact Kim Matheson (Chair Ethics Committee) at 788-2600, ext. 7513, or Dr. W. Jones (Chair Psychology Dept.).

END

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