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**Types and Temperaments:
personality correlates of
belief in, and involvement with
paranormal phenomena**

A thesis presented in partial
fulfilment of the requirements
for the degree of
Master of Arts
in
Psychology
at
Massey University

Maria Madelene Yapp

1995

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Acknowledgements

I am most appreciative of Dr. John Spicer for his guidance in completing my thesis.

"The last year has not been easy.

There were many times when I could have walked away.

But, I held on to what you told me once,

"It's lunacy to throw away data from over 400 subjects!!!"

And, I kept remembering what you told me,

"You are very close to it."

So.

Here I am.

Thank you for your unspoken understanding.

I would like to say a special thank you
to Dr. Dave Clarke,
without whom, I would not have started.

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Summary

The personality correlates of belief in, and involvement with paranormal phenomena were investigated in terms of two personality theories. Jung's (1921/1974) Functional theory of personality types, and Keirsey and Bates' (1984) four-temperament theory were used to generate hypotheses about belief and involvement with paranormal phenomena. The four Jungian personality dimensions and the four temperaments were identified using the Myers-Briggs Type Inventory. Paranormal phenomena were divided into two groups: traditional (religious) phenomena, and anomalous (e.g., psi, witchcraft, precognition etc.) phenomena. Paranormal beliefs were assessed using the Paranormal Belief Scale (PBS: Tobacyk, 1988). Paranormal involvement was assessed using a specially constructed involvement scale that was designed to complement the PBS. A total of 417 subjects drawn from a university population took part in the study. On the four Jungian dimensions, introverts had higher scores than extraverts for traditional belief. Feelers had higher scores than thinkers for traditional belief, traditional involvement and anomalous belief. Perceptives had higher scores than judgers for anomalous belief and involvement. Intuitives had higher scores than sensors for anomalous involvement. Significant Sex x Judging-Perceiving interactions were found for anomalous belief and anomalous involvement. The interactions were due to male judgers having lower scores than female

judgers, or perceptives of either sex. For the four temperaments, Prometheans had lower scores than either Apollonians or Epimetheans for both traditional belief and traditional involvement. However Apollonians had higher scores than either Epimethieans or Prometheans for anomalous beliefs, but both Apollonians and Pometheans had higher scores than Epimethians for anomalous involvement. Belief and involvement scores were also used to validate the PBS and the Paranormal Involvement Scale. The results were initially discussed in terms of the two personality theories. Then a rapproachment between the two theories was shown to be feasible. It was also argued that investigators of personality correlates of paranormal belief had tended to have a negative bias towards believers. Future work regarding the relationship between Jung's theory and temperament theory was suggested.

Chapter 1. Introduction

The objective of the study reported in this thesis was to investigate personality correlates of belief in, and involvement with paranormal phenomena. Two approaches to personality were adopted. One approach used Jung's (1921/1974) Functional theory of personality types, the other approach used Keirsey and Bates' (1984) four-temperament theory. Belief in the paranormal and involvement with the paranormal were regarded as two distinct and separable variables.

Since the mid 1930's there have been over 150 published articles concerned with the various correlates of belief in, and involvement with paranormal phenomena. This reflects the fact that paranormal beliefs in the general population are pervasive and, if religious beliefs are regarded as falling within the domain of paranormal beliefs, are long standing and socially maintained and encouraged. In fact, across cultures, the majority of the population believes in one or more paranormal beliefs (Clarke, 1991; Messer & Griggs, 1989; Sobal & Emmons, 1982, cited in Irwin, 1993). The amount of research data in paranormal beliefs accumulated so far is considered to be substantial (Irwin, 1993).

This literature was extensively reviewed by Irwin (1993) who identified a range of topics in the area that were cause for

some concern. The topics ranged from specific examples like the demand characteristics of the testing situation such as the experimenter's attitude, to general areas such as the scope of paranormal beliefs or the relationship between paranormal beliefs and paranormal involvement. However, only those topics that are pertinent to the current study will be addressed.

The topics that are of concern in the area of correlates of paranormal beliefs fall into three broad categories. Firstly, there was no general agreement about the definition and number of phenomena that constitute the domain of the paranormal. This led directly to the lack of standardized paranormal belief scales. Secondly, involvement with paranormal phenomena was poorly researched. Finally, Irwins's list of concerns can be extended to include the fact that the selection of personality characteristics reflected the frequent use of implicit theories of personality and a negative bias towards paranormal beliefs. The combination of these two issues has produced an incoherent patchwork of personality correlates that render difficult the characterization of paranormal believers.

The domain of the paranormal

Definition of the paranormal

While there is not, as yet, a formally agreed upon definition of the paranormal, there does appear to be a general

consensus of the kinds of phenomena that should be included. According to Thalbourne (1982, cited in Irwin, 1993) the term paranormal refers to hypothesized processes that are, in principle, physically impossible or outside the realm of human capabilities as presently conceived by conventional scientists. A somewhat similar definition was adopted by Tobacyk and Milford (1983) who (citing Alcock, 1981 and Braude, 1978) regarded the paranormal as being (a) inexplicable in terms of current science, (b) explicable only by major revisions in basic limiting principles of science, (c) incompatible with normative perceptions, beliefs, and expectations about reality.

Although a broad consensus of what constitutes the paranormal exists, the precise meaning of the labels given to individual phenomena remains contentious. For instance, Thalbourne (1991, cited in Irwin, 1993) considers Tobacyk's (1988) term "psi" as psychokinesis and his term "spiritualism" as "mind-body dualism". Even the term ESP is debatable. Chaplin (1985) uses ESP to encompass telepathy, clairvoyance, precognition and psychokinesis, while Messer and Griggs (1989) excluded precognition from the term ESP. Additionally, there is also a distinct lack of consensual agreement as to what actual phenomena should be included in the paranormal.

The lack of agreement on what constituted the paranormal was shown by the fact that the range of paranormal phenomena

examined varied widely among researchers. The number of phenomena used in the different studies ranged from just one, ESP (Thalbourne & Haraldsson, 1980), through three, telepathy, clairvoyance and precognition (Murphy & Lester, 1976), to the 15 phenomena used by Clarke (1991). Clarke included a broad spectrum of phenomena which included body auras, psychic healing, ghosts and UFOs, dowsing, hypnosis, karma, poltergeists and sleepwalking, together with the more common phenomena such as psychokinesis, precognition, astrology and telepathy.

Clarke's (1991) use of such a diverse range of phenomena suggests that initially he treated the paranormal as uni-dimensional. Irwin (1993) has also noted that many authors appear to regard the paranormal as a global or uni-dimensional construct. However, among several of Clarke's choices, there appears to be little commonality between, for instance, sleepwalking and poltergeists, or UFOs and body auras. At the same time telepathy, clairvoyance and precognition seem to be sufficiently akin generally to be subsumed under ESP. This suggests that the construct of paranormal may be multi-dimensional.

Traditional and anomalous beliefs

Irwin (1993) pointed out that a persistent result from several correlational or factor analytic studies was that belief in the paranormal is multi-dimensional. However, there is, as yet, little agreement on the number, identity or

orthogonality of the factors comprising the paranormal. The number of factors that have been extracted ranged from two (Sullivan, 1982, cited in Irwin, 1993) to eight (Jones, Russell, & Nickel, 1977, cited in Irwin, 1993). Irwin listed seven studies where the dimensionality of the paranormal had been reported. Of these seven studies, six found that traditional religious beliefs were distinct from other paranormal phenomena. This shows that the separation of traditional religious beliefs from other paranormal beliefs is the most consistent finding in these reports.

This separation of traditional religious beliefs from other paranormal beliefs would be in accord with common usage of the terms. General observation suggests that a belief in the traditional religious phenomena, such as God, the soul, heaven and hell are conceptually different from telepathy, body auras, psychokinesis, UFOs and the like. Hence, common sense indicates that traditional religious beliefs can reasonably be considered to be a distinct set of constructs within the wider context of the paranormal. This distinction has also been made by Schumaker (1987).

Further support for distinguishing between traditional and other paranormal beliefs is supported by Clarke (1991). Although he appeared to initially regard the paranormal as uni-dimensional, he found that, in his sample, paranormal beliefs separated into two groups. One group was associated with the traditional beliefs in angels, devils and life after

death. The second group was associated with beliefs that he called "New Age beliefs", that is, beliefs in telepathy, precognition, clairvoyance, psychokinesis, body auras, astral projection, astrology, biorhythms, psychic healing, spirits, reincarnation, life after death, UFOs and flying saucers. Accordingly, he chose to follow Otis and Alcock (1982) and suggested that beliefs in a Supreme Being, Heaven, Hell, miracles, immortality of the soul and prayer should be included in the first group; and similarly, good luck from black cats, other spirits, witches and extraordinary creatures should be included in the second group.

For the purpose of this thesis, this distinction between traditional and other paranormal beliefs is assumed to be valid. Consequently, the term "paranormal" will include both traditional religious phenomena and those phenomena that are subsumed under the rubric of "anomalous". These anomalous phenomena include such entities as ESP, telepathy, witchcraft, superstition, UFOs, psi, precognition, clairvoyance, and so on. When the two classes of phenomena need to be distinguished, the terms "traditional" and "anomalous" will be used. Distinguishing between traditional and anomalous beliefs is in accordance with Irwin's (1993) recommendation that the facets of paranormal beliefs that are of interest should be clearly specified rather than assuming a global conception of the paranormal.

Measurement of belief in the paranormal

As a consequence of not having a consensual agreement over what constitutes appropriate paranormal phenomena, a wide range of measures have been used to assess belief in the paranormal. Many studies have used rule of thumb questionnaires to assess paranormal beliefs. For instance, Alcock (1982) used a multi-variable scale that included not only questions on paranormal beliefs but also questions relating to probability estimates of unlikely events, statistics, an authoritarian scale, a dogmatism scale and a tolerance of ambiguity scale. Grimmer and White (1990) constructed a 46-item scale using questions derived from the popular media. Thalbourne and Haraldsson used two varieties of "sheep-goat" scales in the one study while Messer and Griggs (1989) used a self-devised scale with unknown reliability and validity. To compound the above problem, the response options for these scales also varied widely, from "true/uncertain/false" choices (Thalbourne & Haraldsson, 1980) to seven point Lickert scales (Tobacyk, 1988). The effect of this diversity of scales has been to render difficult the comparisons among studies.

Tobacyk (Tobacyk & Milford, 1983; Tobacyk, 1988) has been one of the few researchers to produce a paranormal belief scale using well defined terms and appropriate psychometric scale development. Both the original (1983) Paranormal Belief Scale (PBS) and the revised-PBS (1988) tap beliefs in seven clearly defined paranormal phenomena. Unfortunately some

workers in the paranormal area have a tendency to use their own scales in preference to competing scales. For instance, Tobacyk uses the PBS whereas both Thalbourne and Haraldsson consistently use "sheep-goat" scales (Thalbourne, 1981; Thalbourne & Haraldsson, 1980). However, in recent years Tobacyk's scale has been increasingly used by others (e.g., Clarke, 1991; Davies, 1988; Irwin, 1985, 1990a, 1990b, 1991, 1992, 1994; Persinger & Richards, 1991; Saucer, Cahoon, & Edmonds, 1992; Schumaker, 1987). Since the PBS is a well constructed scale, by using it the problems attendant on idiosyncratic definitions of the range and content of the paranormal can be greatly reduced. Continuing the trend towards using Tobacyk's scales should also ease comparisons with future studies. Therefore the PBS was chosen as the belief scale for the current study.

Involvement with paranormal phenomena

A further important issue that is directly related to the current study is the association between belief in, and involvement with paranormal phenomena. Irwin (1993) noted that this area had been poorly researched. Often in studies where paranormal involvement was included, it was treated as a rather incidental or peripheral issue. For example, Murphy and Lester (1976) simply commented that belief in ESP was related to paranormal experiences but not related to participation in activities such as yoga and mind control. Even though Messer and Griggs (1989) included a question

relating to paranormal involvement for each paranormal phenomenon included in their questionnaire, instead of distinguishing between belief and involvement they treated them as merely two sides of the same coin. Irwin suggested that this lack of research interest was because the association may be so predictive as to be uninteresting.

There are a number of studies where involvement with paranormal phenomena was mentioned. These studies indicated that a moderate to high global paranormal belief might encourage an individual to: seek entertainment with a paranormal theme (Otis, 1979); read material on the paranormal (Irwin, 1985); participate in psychic development or parapsychology courses and to practise as a medium or psychic (McGarry & Newberry, 1981); interpret out-of-ordinary experiences as paranormal (Ayeroff & Abelson, 1976; Benassi, Sweeney, & Drevno, 1979); claim to have had paranormal experiences (Glickson, 1990; Murphy & Lester, 1976); and to use mind-expanding drugs or other methods to induce altered states of consciousness (Roney-Dougal, 1984, cited in Irwin, 1993). Although these studies appear to imply that belief in the paranormal may cause paranormal involvement, this unidirectional view may not be strictly correct. Irwin (1993) suggested that the association between paranormal beliefs and paranormal involvement may be circular or bi-directional, with paranormal beliefs encouraging paranormal involvement and with paranormal involvement serving to maintain such beliefs.

Irwin's (1993) suggestion regarding the bi-directionality of paranormal belief and involvement may, itself, be rather restricted in its scope. The results from McGarry and Newberry (1981) illustrate this possibility. They found two distinct groups of subjects. One group had high belief scores and high involvement scores which suggests the presence of a bi-directional relationship. However, they also found a group who had high belief scores but low involvement scores, this is contrary to the idea of a bi-directional relationship. One wonders whether or not further investigation may reveal the two complementary groups that logically can exist: the low believers-high involvement group and the low believer-low involvement group.

Everyday observation would indicate that it is not always true that belief is a necessary precursor to the associated behaviour; nor it is always correct to say that behaviour demonstrates the implicit attitude of one's beliefs. It is not uncommon to hear someone remark that he or she no longer engages in any religious activities but still maintains a belief in the existence of some kind of Supreme Being. The outward religious behaviour of these individuals may show no difference from those who are atheistic. Furthermore, there are groups of people who might be very involved in investigating the paranormal area and yet do not hold any paranormal beliefs. For example, members of the Sceptics Society are certainly very involved in the paranormal in order to debunk such "irrational" beliefs. Also, for some

subgroups, paranormal beliefs may also be independent of paranormal involvement, or negatively correlated with it. For example, parapsychologists who are much involved in their research into the paranormal can be either believers, sceptics or even neutral in their beliefs.

The fore mentioned considerations suggest that, just as different subgroups may believe differentially in different paranormal phenomena, so different subgroups may be differentially involved with particular paranormal phenomena. Because paranormal beliefs and paranormal involvement may be mutually reinforcing in some instances, or mutually exclusive or negatively correlated in some others, belief and involvement should be clearly distinguished. Accordingly, belief in traditional and anomalous phenomena was investigated separately from involvement with traditional and anomalous phenomena in the current study.

Personality correlates of paranormal beliefs

An examination of the literature on paranormal beliefs showed that a wide range of variables have been investigated. The variables examined included demographic ones such as age (Clarke, 1991), sex (McGarry & Newberry, 1981), ethnicity (Murphy & Lester, 1976), socio-economic status and political affiliation (Sheils & Berg, 1977, cited in Irwin, 1993); cognitive variables such as educational status (Otis & Alcock, 1982), grade point average (Tobacyk, 1984),

creativity (Joesting & Joesting, 1969) and intelligence (Jones, Russell, & Nickel, 1977, cited in Irwin, 1993); and personality variables such as social alienation (Tobacyk & Pirttila-Backman, 1992), interpersonal trust (Tobacyk, 1983a) and locus of control (McGarry & Newberry, 1981).

Because only the personality correlates of paranormal beliefs are pertinent to this study, other than sex, variables like the cognitive and demographic will not be further considered.

There have been a number of reports indicating that the sexes differ in their anomalous beliefs. Females have usually shown stronger beliefs in psi, precognition and astrology (e.g., Clarke 1991; Gray, 1990; Persinger & Richards, 1991) whereas males have shown stronger beliefs in UFOs and extraordinary life forms (Clarke, 1991; Persinger & Richards, 1991; Tobacyk & Milford, 1983). Strictly speaking, sex is not a personality characteristic, nevertheless it has such a strong influence upon personality that it was included as a variable in the current study

Personality correlates

Irwin (1993) noted, in his extensive review of personality correlates of paranormal beliefs, that research in the area has been substantial. A wide range of personality correlates have been investigated. These personality correlates can be broadly divided into two categories: interpersonal correlates and individual personal correlates.

Interpersonal variables investigated so far have included: extraversion (Lester, Thinschmidt, & Trautman, 1987; Thalbourne, 1981; Thalbourne & Haraldsson, 1980); social alienation (Tobacyk, 1985; Tobacyk & Pirttila-Backman, 1992); social interest and interpersonal trust (Tobacyk, 1983a); authoritarianism (Randall, 1991); fear of social ridicule (Davies, 1985), general and social self efficacy (Tobacyk & Shrader, 1991); adolescent nihilism and heavy rock music (Trostle, 1986); interpersonal control (Tobacyk, Nagot, & Miller, 1988) and beliefs about the complexity and variability of human nature (Tobacyk & Milford, 1988).

Individual personal correlates have included: perception of self (Tobacyk & Milford, 1983); identity achievement (Tobacyk, 1985a); alienation and anomie (Tobacyk, 1985b); narcissism (Tobacyk & Mitchell, 1987); trait anxiety (Tobacyk, 1982); neuroticism (Fichten & Sunerton, 1983; Windholz & Diamant, 1974); thinking-feeling (Murphy & Lester, 1976); dogmatism (Alcock & Otis, 1980; Tobacyk & Milford, 1983); death threat and death concerns (Tobacyk, 1983b; Tobacyk & Pirttila-Backman, 1992); psychological adjustment (Irwin, 1991, Tobacyk & Milford, 1983); magical ideation (Tobacyk & Wilkinson 1990); preferences for games of chance (Tobacyk & Wilkinson, 1991); fantasy proneness (Irwin, 1990); self-actualization (Clarke, 1993), locus of control (Tobacyk, Nagot & Miller, 1988); and, irrational beliefs (Tobacyk & Milford, 1983).

The above categories of personality correlates of paranormal beliefs (which are not exhaustive) reveal that a considerable amount of work has been done in the area. Also, the wide range of personality characteristics used indicates that researchers have examined the personality correlates of paranormal belief from many different perspectives. This is because each personality characteristic that is chosen implies that a personality framework, from which the characteristic is derived, has been adopted, at least implicitly, by the investigator.

Hence, depending on the individual implicit theories or what Pervin (1990) terms "mini theories", about what constitutes the personality of the paranormal believer, researchers often selected their own personality characteristics to correlate with paranormal beliefs. They also used a variety of personality assessment instruments to test their hypotheses. Irwin (1990) suggested that the personality construct "fantasy proneness" might play a part in belief in paranormal phenomena. He used a fantasy proneness measure and a paranormal belief scale to assess the relationship. Clarke (1993), on the other hand, proposed that self-actualization might be related to some aspects of paranormal beliefs, and used a self-actualization index as an assessment instrument. Alcock and Otis (1980) hypothesized that "critical thinking ability" might be related to paranormal beliefs, and used a critical thinking scale. Rotter's (1954) Social Learning theory has been a source of inspiration to some others.

McGarry and Newberry (1981) and Sheidt (1973) used locus of control scales to assess the relationship of locus of control and paranormal beliefs; Schumaker (1987) used a mental health scale to examine the notion of "mental health"; Fichten and Sunerton (1983) adopted a composite Temperament-Social Learning approach to personality in examining the relationship of paranormal beliefs and personality. Others like Lester et al., (1986) and Murphy and Lester (1976) explored the use of the Jungian personality dimensions.

Tobacyk and Mitchell (1987) suggested that a narcissistic personality might be related to paranormal beliefs and so used a narcissistic personality inventory to explore the relationship. Similarly, Tobacyk and Shrader (1991) hypothesized that superstition would correlate negatively with self-efficacy and so used a self-efficacy scale. Standing and Keays (1987) investigated a general "gullibility factor", while Tobacyk (1985) examined "identity achievement" with paranormal beliefs.

Tobacyk is one of the most prolific authors in the area. He has examined the relationship of paranormal beliefs and many different kinds of personality characteristics. For example, he (Tobacyk, 1985b) suggested that a sense of estrangement from oneself and society might be related to paranormal beliefs and used an alienation scale to examine the relationship. Then again he (Tobacyk, 1983a) examined such personality constructs as "interpersonal trust" and "social interest". To do this, he used an interpersonal trust scale and a social interest scale. Furthermore, after citing his

earlier work where he had investigated personality constructs such as locus of control, irrational beliefs and dogmatism as personality correlates of paranormal belief, he proceeded to add another correlate to the list, cognitive complexity Tobacyk (1983c).

Unfortunately, when personality characteristics are treated as isolated personality constructs that bear little relationship to other personality constructs, they can form an incoherent patchwork of different aspects of personality that happen to correlate with paranormal beliefs. Irwin (1993) in his extensive review, was strained to pull the various personality correlates together when attempting to form a coherent profile. Even so, he could only conclude that the non-religious believers in paranormal phenomena, in their relationships with others, tended to be outgoing but rather self-centred.

Such frequent use of implicit theories when investigating the personality correlates of paranormal beliefs reflects the fact that the relevant research has so far been unsystematic. There is an urgent need to create a framework that will give a coherent direction for further research.

Defining personality characteristics from theory

The results from any study using one particular theory, implicit or otherwise, can only be meaningfully interpreted in terms of its theoretical framework. Before any theory can be used a practical way, it must be operationalized via an assessment instrument that is, ordinarily, unique to that

theory. Thus, a personality characteristic obtained by using an instrument appropriate to one theory will generally differ in fundamental ways from those obtained using an instrument appropriate to another theory. Hence, Tobacyk's (1983b) "death threat" and "death concerns" as personality characteristics do not correspond to any of the Jungian processes and attitudes that Murphy and Lester (1976) examined.

Fitchen and Sunerton (1983), McGarry and Newberry (1981) and Schumaker (1987) have provided a theoretically based interpretation of their own results. Unfortunately, there were many who provided little interpretation of their results in terms of their theoretical assumptions. There are a number of reasons for this inadequate interpretation. Firstly, because many researchers relied on implicit theories to generate hypotheses, their implicit theories often consisted of simple definitions of the personality constructs from which little interpretation could be made. For example, when Tobacyk (1985b) correlated alienation and anomie with paranormal beliefs, little could be said except for the correlations found. Secondly, even when the theoretical framework provided a sound basis for interpretation, some researchers only reported the correlations between the personality characteristics and paranormal beliefs giving little interpretation of the results. For example, when Lester and his co-workers (Lester et al., 1987; Murphy & Lester, 1976) correlated the four Jungian personality dimensions with the scales of paranormal beliefs, they only reported that the thinking-feeling dimension was repeatedly

found to correlate with paranormal beliefs. No attempt was made to account for this correlation by interpreting the personality correlates based on Jungian Functional theory. Hence, with or without any sound theoretically based framework, the assessment measures were often used only as labelling and descriptive devices.

It was unfortunate that the approach adopted so far has unintentionally created a collection of personality correlates that sheds little light on why believers believe and non-believers do not. Unless these personality correlates can be interpreted in a way that allows the personality structure of paranormal believers to be understood, the answer to why believers believe will remain elusive.

This situation is further exacerbated by the negative bias that is evidenced by the personality characteristics that have so far been investigated.

Negative bias in choosing personality characteristics

Irwin (1993) considered that, collectively, the personality characteristics that had been chosen for investigation in connection with paranormal beliefs, had negative connotations. An examination of the personality characteristics that have been correlated with paranormal beliefs reveals a rather negative bias in their selection. Neuroticism, trait anxiety, narcissism and death threat are

some of the examples. This negative bias has stemmed from researchers' sceptical views regarding the reality of paranormal phenomena. Many sceptical researchers like Alcock (1981, cited in Irwin, 1993) have depicted paranormal believers as credulous, dogmatic and generally lacking in basic intellectual skills. Irwin concluded that much of the sceptical research seemed to have had the implicit objective of demonstrating that paranormal believers are deficient in intelligence, personality, education and social standing.

It appears then, that different researchers not only have their own implicit theory of personality, but often their selections of personality characteristics were tainted by their own opinion of the reality of paranormal phenomena. As a result, the variables selected reflects this negative view of paranormal believers. In spite of the fact that such data could still be useful, it nevertheless biases the collective empirical literature in a negative fashion. On the whole, as Irwin (1993) pointed out, there has been a relative lack of research in the potential positive attributes of paranormal believers. Hence, further research in personality correlates of paranormal beliefs must be geared towards a more objective selection of personality variables to redress the issue of such bias.

By adopting an explicit personality theory, the effects of personal bias of the investigator on the outcome of a study should be reduced. This is because the theory itself

determines the possible personality characteristics that could be correlated with belief. In this way, theoretically derived personality characteristics would be neutral in a socially evaluative sense.

To summarize, since choosing any particular personality characteristic implies the use of the personality theory from which it derives, any investigation involving personality characteristics should specify, explicitly, the theoretical framework within which the investigation is to take place. Furthermore, the permissible personality characteristics that can be correlated with other variables can only be taken from among those that are specified by the theory. Finally, the hypotheses should be derived from the particular theory and the results should be interpreted in terms of that same theory. This, of course, does not preclude using different theories provided this is made explicit and the distinction between them is maintained. If the procedure is not followed in its entirety, there is a risk that the correlates will remain as mere labels.

The research reported in this thesis was carried out within this conceptual framework.

Theoretical specifications

Jung's Functional theory of personality (Jung, 1921/1974) was selected to provide the theoretical basis for the current study. Jung's theory is fully developed with an extensive

theoretical framework. It is one of the most comprehensive personality theories available (Lawrence, 1982) and it has had a considerable impact upon other personality theories. Jung's Functional theory posits four personality dimensions that can be correlated with other variables; these dimensions are bipolar. Also, the qualities that, theoretically, are expected to be associated with each pole of the dimensions are well described. Furthermore, the theory has considerable explanatory power. It provides a framework to account for why people behave in the way that they behave, rather than simply describing how they behave.

The theory has been fully operationalized in the form of the Myers-Briggs Type inventory (MBTI: Myers & McCaulley, 1985). On the basis of their questionnaire scores, the MBTI assigns individuals to one or another of the 16 possible Jungian personality types. Unlike many other personality assessment instruments, the MBTI is designed for use with a normal, non-clinical population (John, 1990). There were also a number of studies that had been carried out within a Jungian framework and which could be used for comparative purposes.

Murphy and Lester (1976) used a Jungian approach to investigate the relationship between paranormal beliefs and personality. Using the MBTI to assess personality, they found that Jung's thinking-feeling dimension was correlated with belief in ESP. This result replicated that of a pilot study in which the remaining Jungian dimensions were

uncorrelated with belief in ESP. Later, Lester et al., (1987), using the Keirsey Temperament Sorter as an alternative to the MBTI, found a correlation between the Jungian thinking-feeling dimension and belief in anomalous phenomena. They also found an association between anomalous beliefs and both the sensing-intuition dimension and the judging-perceiving dimension.

Furthermore, the association between Jung's Functional theory and the MBTI provided a further important reason for adopting a Jungian approach to personality. This was the link between the MBTI and Keirsey and Bates' (1984) variant of the Hippocratic four-temperament theory of personality. Keirsey and Bates divide the population into four personality groups or "temperaments". This modern version of four-temperament theory provides a ready made portfolio of four personality portraits or descriptions. These, it is claimed, categorize fully the entire range of human personality. Also, they claimed that these four temperaments are embedded in the MBTI personality types and that scores on the MBTI can therefore be used to identify the temperaments.

The consequence of Keirsey and Bates' (1984) claims was that it became possible to generate hypotheses and interpret the obtained data from two very different theoretical positions. Most importantly, this could be done without considering either equating personality characteristics between theories, or the incommensurability of different measuring instruments.

A detailed consideration of the two theories will now be undertaken. It should be noted that a critique of the two theories (and personality theories in general) is beyond the scope of this thesis.

Jung's Functional theory of personality types.

Jung (1921/1974) developed one of the more comprehensive personality theories in an attempt to explain human personality. While others saw randomness in individual human behaviour, Jung saw repeating patterns in that same behaviour. After many years of studying people Jung came to the conclusion that, despite being driven by the same biological instincts, individuals differ among themselves in very fundamental ways. Jung considered all instincts to be of equal importance, hence the determining factor was how one prefers to "function". He argued that the preference for a particular manner of functioning was characteristic for the individual. Consequently all individuals could be "typed" by their preference. The essence of Functional theory is the way in which Jung developed the concept of "psychological or functional types".

The preferred patterns that individuals used when gathering information from their world together with the ways in which they used it as a basis to make interpersonal judgements were called "psychological types" by Jung. For Jung, all conscious mental activity can be separated into perceptive

and judgement processes. Perceptive processes are the two perceptive functions, sensing and intuition. The judgment processes are the two judgement functions, thinking and feeling. In Jung's theory, the two perceptive functions, sensing and intuition, are polar opposites. Similarly, the two judgement functions, thinking and feeling, are also polar opposites. The four functions can therefore be considered to form the poles of two dimensions, the sensing-intuitive (S-N) dimension and the thinking-feeling (T-F) dimension. These four basic functions were classified by Jung into two rational functions, thinking and feeling (Jung, 1921/1974, p. 435) and two irrational functions, sensing and intuition (p. 453). That is, thinking and feeling can be subjected to rational scrutiny but sensing and intuition are not amenable to such scrutiny.

Functions

A psychological function is "a particular form of psychic activity that remains the same in principle under varying conditions...[much] as a physical force can be considered a specific form or manifestation of physical energy" (Jung, 1921/1974, p. 436). The four functions "cannot be related or reduced to one another" (p. 437). So the four functions are clearly distinguishable from one another. The major assumption of Functional theory, then, is that all of the many aspects of conscious mental activity can be accounted for by various combinations of these four functions.

The essence of Jung's theory of psychological types was his belief that everyone uses the four basic functions, sensing, intuition, thinking and feeling. Each and everyone of us uses these four functions daily. He considered that these four functions represent the manner of our orientation to consciousness; hence they are also known as the orienting functions. In order to understand the Functional theory of types, one must understand how the terms perception and judgement are used by Jung.

Perception

Jung did not give a formal definition of perception but according to the interpretation of his work by Myers and McCaulley (1985) perception "includes the many ways of becoming aware of things, people, events, or ideas. It includes information gathering, the seeking of sensation or of inspiration, and the selection of the stimulus to be attended to." (p. 12). Jung divided perception into two categories, sensation and intuition.

Sensation

Sensation is one of the basic psychological functions and for Jung is identical to perception. Thus, it "mediates the perception of a physical stimulus" and relates to both external and internal stimuli as sense perception e.g. visceral, kinaesthetic, vasomotor etc" (Jung, 1921/1974, p. 461). Sensing thus has characteristics of both the primary sensory input and also its subsequent associated ideation or

affect. The sensing function is strongly developed in children and the primitives. In their cases, this sensing function predominates the thinking and feeling functions. Jung regards sensing as conscious perception. It is an elementary phenomenon that is not subject to rational laws and is therefore an irrational function.

Myers and McCaulley (1985) describe sensing similarly. They see sensing as "perception observable by way of the senses" (p. 12). Sensing tells what exists. Before attending to the senses one is required to attend to the present, the here and now. People who prefer to use the sensing function tend to focus on the immediate situation.

Lawrence (1982) describes those who have developed good sensing perception as having a differentiated awareness of present experience, acute powers of observation, a memory for facts and detail, and a capacity for realism, for seeing the world as it is. He concludes that the attitudes that developed as a result of the preference for sensing are a reliance on experience rather than theory, a trust of the conventional and customary way of doing things, a preference for beginning with what is known and real, and then moving systematically, step by step, tying each new fact to past experience and testing it for its relevance in practical use.

Intuition

Intuition is also a basic psychological function which mediates perceptions in an unconscious way. Everything, including all inner or outer objects and their relationships can act as focus for this perception. The intuition function is peculiar in the sense that it is not sensing perception, nor is it thinking or feeling. However the subjective experience of intuition may seem to be any one of them. In intuitive perception, a content presents itself in a whole and complete way, without consciously knowing where it is coming from. It is a kind of instinctive apprehension. Like sensing the information obtained has a certainty to it. This certainty and conviction rest on a kind of unconscious psychic "alertness" whereas the certainty of the sensing rests on physical foundation. Jung distinguished between subjective intuition and objective intuition. Subjective intuition is a perception of some unconscious psychic data originating in the subject. Objective intuition is a perception of data derived from subliminal perceptions of the objects and on the reactions they evoke. He further distinguished between the abstract and concrete forms of intuition. Concrete intuition is a reactive process and mediates perceptions concerned with the actuality of things. It responds directly to the given facts. Abstract intuition is a proactive process and mediates perceptions of ideational connections. Intuition is also infantile and primitive. It is an irrational function. It counterbalances the sensing

function by mediating perceptions of ideas (Jung, 1921/1974, p. 453 et seq.).

Myers and McCaulley (1985) put it more simply, intuition is "perception of possibilities, meanings, and relationships by way of insight" (p. 12).

Lawrence (1982) describes those who have developed intuitive perception as having insight into complexity, an ability to see abstract, symbolic and theoretical relationships, and a capacity to see future possibilities, often creative ones. His conclusions about the effect of a preference for an intuitive preference was that the attitudes that developed as the result were essentially, a reliance on inspiration rather on past experience, an interest in the new and untried, and a preference for learning new materials through an intuitive grasp of meanings and relationships. Often intuition comes as a hunch or the sudden awareness of a pattern of some seemingly unrelated circumstances.

Judgement

As with perception, Jung gave no formal definition of judgement, but Myers and McCaulley (1985) give a succinct summary of his thoughts. Judgement refers to "all the ways of coming to conclusion about what has been perceived. It includes decision making, evaluation, choice, and the selection of the response after perceiving the stimulus" (p.

12). Jung divided judgement into two categories, thinking and feeling.

Thinking

Thinking is the third of the basic psychological functions, bringing the contents of ideation into conceptual connection with one another using its own laws. It is an apperceptive activity and occurs in active and passive forms. Active thinking is a result of an act of the will in which the individual submits the contents of ideation to a voluntary act of judgement. In contrast, passive thinking merely occurs; fortuitous or capricious conceptual connections establish themselves of their own accord, and judgements that are formed may even contradict the individual's intention (Jung, 1921/1974, p. 481). In sum, thinking is a form of intellectual judgement where the objective is to establish conceptual relations and make decisions about them. To simplify Jung's descriptions, thinking refers to "the function that links ideas together by making logical connection" (Myers and McCaulley, 1985, p. 12).

Lawrence (1982) describes those who have developed thinking judgement as having powers of analysis, and an ability to weigh facts objectively including consequences, unintended as well as intended. The attitudes that developed as a result of the preference for thinking were described as objectivity, impartiality, a sense of fairness and justice, and skill in applying logical analysis.

Feeling

Feeling, the last of the basic psychological functions is a process that sometimes mediates between the ego and a given content. It thereby imparts a definite sense of value such as acceptance or rejection to the content. This process can sometimes be isolated in the form of a "mood" which also imparts a value judgement to the content. In short, feeling is an entirely subjective process, which may be independent of any external stimuli, and can set up a subjective criterion of acceptance or rejection; such valuation extends to every aspect of consciousness. There are two kinds of feeling, abstract and concrete. Abstract feeling transcends the differences of the individual contents it evaluates, thus producing a "mood" that thereby renders them unimportant. Concrete feeling are more subjective and personal leading to a more impulsive evaluation of individual content. Feeling is a rational function because values are assigned according to the laws of (subjective) reason. Jung noted that no definitions could give the essence of feeling, they could only describe feelings from the outside. This is because thinking cannot formulate the real nature of feeling since thinking belongs to a category incommensurable with feeling. In fact, no psychological function can ever be completely expressed by another. The very notion of classification denotes intellectual thought and is therefore incompatible with the nature of feeling.

More succinctly, feeling is "the function by which one comes to decisions by weighing relative values and merits of the issues" (Myers & McCaulley, 1985, p. 12).

For Lawrence (1982) individuals who use feeling judgement show a development of values and standards, and a knowledge of what matters most to themselves and other people. Thus, because values are often subjective and personal, people who prefer to use feeling judgement tend to make decisions based on what matters to themselves and to others. The attitudes developed as a result of a preference for feeling judgement are, an understanding of people and wish to affiliate with them, a desire for harmony, and a capacity for warmth, empathy and compassion.

To summarize, the nature of the four functions is such that, whatever the nature of thoughts or experiences that come into conscious awareness, they must come through the senses or through intuition. The perceptive process must be used in order to remain consciously aware. The information must then be subjected to the judgement process of thinking or feeling, that is, sorting, weighting, analyzing and evaluating. Every individual uses all four functions, but with differences in both the degree of competence in using them and the preference to use one function rather than another. People with sensing as the dominant function tend to be practical and pragmatic while those with a dominant intuition tend to spend more time on theories, abstractions and intuitive

insights. People with thinking dominant tend to be logical and analytical. Those with feeling dominant tend to seek harmony in relationships and make decisions based on subjective values. In short, the dominant function indicates the particular way that the individual approaches life. For any one function to be dominant means that the functions can be ranked in order of preference. This ordering is determined by the interaction of the functions with two other dimensions or, as Jung termed them, attitudes.

Attitudes

In addition to the four orienting functions Jung also conceived the notion of an attitude which is "a readiness of the psyche to act or react in a certain way". Alternatively, "To have an attitude means to be ready for something definite, even though this something is unconscious; for having an attitude is synonymous with an *a priori* orientation to a definite thing, whether this is represented in consciousness or not." (Jung, 1921/1974, p. 414). Jung recognised only one attitude, the extraversion-introversion (E-I) dimension. He did not recognize the judging-perceiving (J-P) dimension that is implicit in the theory.

Extraverted and introverted attitudes

Jung devoted the greater part of his *Psychological Types* to one particular dimension of personality structure, the E-I

dimension. This describes the individual's attitudes or orientation to life.

Extraversion

Extraversion is a transfer of interest from subject to object. Someone with an extraverted attitude thinks, feels and behaves towards the object, that is, the focus is directed outwards from the subject to the object. If it is extraverted feeling, the subject feels himself into it. If it is extraverted thinking, the subject thinks himself into it. Extraversion can be active when it is intentional from the subject; and passive when the object compels the subject towards it (Jung, 1921/1974, p. 427).

When someone has an extraverted attitude the "attention seems to flow out, or to be drawn out, to the objects and people of the environment" (Myers & McCaulley, 1985, p. 13). Myers and McCaulley explain this to mean that people who prefer the extraverted attitude tend to be aware of and focus on the environment, to be action oriented, to be more open and more sociable.

Introversion

Introversion is the other pole of the E-I dimension. Here, interest is drawn from the object to the subject; the focus is directed towards the subject. Everyone whose attitude is introverted thinks, feels, and acts in a way that clearly demonstrates that the subject is the prime motivating factor

and that the object is of secondary importance. Introversions can be active when the subject deliberately shuts himself from the object; and passive when the subject is unable to restore the energy flowing from the object back to it (Jung, 1921/1974, p. 452).

Similarly, Myers and McCaulley (1985) write that for those with an introverted attitude, the "energy is drawn from the environment, and consolidated within one's position" (p. 13). People who prefer the introverted attitude are more interested in the inner world of idea and concepts and their clarity. They are more contemplative, detached, thoughtful private and tend to enjoy solitude.

Judging and perceptive attitudes

Although Jung explicated the dimensions of S-N, T-F and E-I, he did not realise that a fourth dimension was implicit in his theory. Jung had used the two terms, perceiving and judging, as descriptors to distinguish the two bipolar functions. He did not realise that the relationship between the two functions could be described by a *meta* dimension, that of judgement-perception. Like the E-I dimension the fourth, J-P, dimension also represents an attitude to the outer world. The contribution that Briggs and Myers (Lawrence, 1982) made to the theory of psychological type was their recognition, and investigation of the J-P attitude.

Judging

When a judging attitude is preferred, a judgement function is shown in orienting to one's outer life (activities). Thus, "the natural drive is to have things decided, judged, settled, planned, organized, and managed to plan" (Lawrence, 1982, p. 12). People who prefer judgement functions in their outer behaviour tend to be decisive, purposive and organized.

Perception

When a perceiving attitude is preferred, and thus a perceptive function is shown towards one's outer world, "the natural drive is toward keeping things open to new perceptions. The person wants to stay flexible so as to adapt to changing circumstances, and to experience life as widely as possible" (Lawrence, 1982, p. 12). Those who prefer to display perceptive functions in their outer behaviour tend to be curious, open to new ideas and directions, spontaneous, flexible and adaptable. It was Briggs and Myers who elaborated and operationalized the J-P dimension through the development of the MBTI.

To summarize, in Jung's Functional theory of psychological types, as extended by Briggs and Myers (Lawrence, 1982), all conscious mental activity that occurs does so as the resultant of two bipolar processes, S-N and T-F that generate four (orienting) functions. These four functions are further modified by the two bipolar attitudes, E-I and J-P which can be considered to generate four orientations. The term is

here used to indicate that they determine the orientation of the four orienting functions. Briggs and Myers (Lawrence, 1982) made an important contribution to the theory by recognising that with four functions and four orientations, 16 personality types were possible. It is the dynamic interplay of the functions with the orientations that determines the individual personality types.

Dominant functions

From childhood, each of us prefers to use one function more than the others, so that particular function is used more regularly and becomes the dominant function. Similarly, for the two attitudes, one pole of each is found to be more congenial or effective than the other. It is these preferences that determine the rank ordering or relative strengths of the four functions, and also which of them are shown to the outer world. In this, certain rules are followed to assure balance among the four functions (Myers & McCaulley, 1985). One rule is that two functions are shown to the outer world, two are concealed from the world. Another is that the inner and outer pairs must have one function from each of the J and P poles; an inner or an outer pair consisting of both N and S or of both T and F is prohibited.

Consider first the effect of the J-P attitude on the four functions. Suppose that the judging pole is the preferred pole; this means that a judging attitude is held and hence

either a thinking or feeling function will have priority in the interaction with the E-I attitude. Similarly, if the perceptive pole is preferred, either sensing or intuition will get priority. In short, the J-P attitude fixes the priority of the interaction between the preferred pair of functions and the E-I attitude. Note, however, that the J-P attitude does not determine which member of the preferred pair will be shown to the outside world and hence get the E-I priority.

Turning now to the E-I attitude, this fixes the rank ordering of the four functions. The descending order is: dominant, auxiliary, third and inferior. This ordering directly indicates both the preference and competence in using the functions. The inferior function is the polar opposite of the dominant one, that is, they come from the same pair; one is an inner function and the other is an outer one. Similarly, the auxiliary and third functions come from the same pair, one inner and one outer. Here, three rules are followed. Firstly the extraverted pole acts upon the outer functions while the introverted pole acts upon the inner ones. Secondly, the preferred poles of the E-I and J-P attitudes act together and the non preferred poles of the two attitudes act together. Finally, the preferred pole of the E-I attitude establishes the dominant function on the preferred pole of the J-P attitude.

For Jung, type development is a lifelong process that starts with an undifferentiated disposition to use one particular dominant function. With experience, reinforcement and maturation the various functions manifest themselves in their natural rank order. In midlife, some individuals are able to transcend this ordering and move happily between differing dominant functions (McCaulley, 1981). Because a type develops throughout life, it may not be clearly shown by the young due to the dominant function being insufficiently differentiated to integrate the personality. Once the dominant function has developed sufficiently, the auxiliary function begins to develop, so helping to balance the personality. By midlife, the inferior function should have started to develop thereby completing the process.

Jungian typology, then, is a complete theory of personality that treats the individual in a dynamic manner. In Functional theory, two bipolar orienting processes interact with two bipolar attitudes to determine an individual's expressed personality type. The two processes combine with the two attitudes to generate 16 possible types characterized by the four outwardly shown poles of the four dimensions. These poles emerge and are used progressively over the developmental years in an individually characteristic order of preference. With maturation the degree to which one pole is preferred over another declines until a fully balanced personality has developed where all poles can be used with equal ease. Also, the theory has been the inspirational

basis for developing a well established and validated instrument for evaluating personality, the Myers-Briggs Type Inventory (MBTI).

Keirsey and Bates' temperaments

Historical outline

The earliest known personality classification is the well known grouping into four temperaments by the Greek physician, Hippocrates, around 400 B.C.. The philosophy leading to these four temperaments was the classical belief that man is a microcosm of nature and should therefore be a reflection of the properties of the cosmos. The natural elements of Air, Earth, Fire and Water would be expressed in the "humours" of the human body as Blood, Black bile, Yellow bile and Phlegm. These corresponded to the four temperaments. The temperaments and their descriptions being: melancholic (sad, depressed), phlegmatic (apathetic), sanguine (optimistic, hopeful) and choleric (irascible). Whatever humour was present in excess determined the individual's public temperament (Allport, 1937). Similar categories also arose independently among the Hindus (Doyle, 1992) and the native American Indians (Giovanni, Berens, & Cooper, 1987).

The tradition of a four-temperament theory has been traced over the succeeding two and a half millennia by Merenda (1987) mainly to whom is due the following historical outline. During the middle ages four temperament theory was maintained by the writings of Galen (c. 200 A.D), and later, by Paracelsus. Galen's temperament theory, was then taken up by Wundt and modified by him in the early years of this century. If the Hippocratic-Galenian theory is modeled by two orthogonal dimensions of Phlegmatic-Choleric and Sanguine-Melancholic, then Wundt's model becomes two orthogonal dimensions that are intermediate between those of the Hippocratic model. Wundt's dimensions are called Emotional-Unemotional and Changeable-Unchangeable.

Wundt's model was adapted by Marston into a physiologically based four-factor temperament theory. This in its turn was remodelled into a four-factor arousal model by Marston's pupil, Clarke. Since Clarke published his model, a number of other four-factor models have appeared. Chronologically the twentieth century models listed in Merenda (1987) are: Wundt (1903), Marston (1931), Clarke (1948), Gordon (1953) Denton (1954), Eysenk (1964), Bus and Plomin (1975) and Cruise (1980). Similar models were proposed by Heymans (1908), Pavlov (1928) and Stagner (1948) who are all listed in Lester (1990).

Notably, from Hippocrates through to Cruise, only four of these models attempt to provide a theoretical underpinning.

The exceptions, Pavlov, Marston, Clarke and Eysenk all tried to account for the temperaments in terms of underlying physiological processes. Unfortunately the evidence for the relationship between physiology and temperaments is complex, equivocal and difficult to interpret (Eysenk, 1990).

Furthermore, all models are basically behavioural classifications as can be seen from a selection of the factor names from the various models. From Clarke come Assertiveness, Sociability, Tranquillity and Tractability; Gordon used Ascendency, Responsibility, Emotional stability and Sociability; Eysenk used Introversion, Extroversion, high and low Neuroticism; Bus and Plomin used Emotionality, Activity, Sociability and Impulsivity. Hippocrates' and Wundt's temperaments having already been described, the similarity across all of the models is readily evident.

According to Allport (1937), the popularity of the four-temperament model is partly due to the fact that the temperaments reflect the emotional basis of personality. Allport's other reason for the popularity is the flexibility of the model that comes from the fundamental dimensions of emotional responding that it implies. Wundt saw that people differed in both the characteristic *speed* of emotional arousal and in the *intensity* of their response to that arousal. Thus a quick-slow arousal combined with a strong-weak response produces a four fold classification of

emotional temperament that is readily equated to the Hippocratic descriptors. But, as Allport notes, instead of emotional speed and strength one can choose emotional breadth and depth; alternatively the affective tone of pleasure paired with the kinetic dimension of excitement. As he demonstrated, the Hippocratic temperaments fit nicely into each four fold way. An examination of either Merenda (1987) or Lester (1990) shows that the descriptors of all the listed models are similarly akin to those of Hippocrates.

The temperament models so far described were all devised in terms of an ordinary population but a number of other four-factor models, derived from a study of abnormal populations, have appeared in the clinical literature during the first half of this century. Adickes, Spranger, Kretschmer, and Fromm were the major ones cited by Keirsey (1987).

Kretschmer's model was based, in part, on somatotypes and this was thoroughly demolished by Allport (1937). Regardless of how the various temperament models were derived, all can be fitted to the archetypical Hippocratic schema (Keirsey, 1987; Merenda, 1987; Lester, 1990).

This then is the background to the development of one of the most recent variants of models based on temperament theory: Keirsey and Bates' (1984) Temperament theory.

It was noted earlier that Jung's personality theory is reductionist in nature. In this respect it is similar to

many personality theories of the 20th century (Pervin, 1990). It was as a reaction to these reductionist approaches that Keirsey and Bates (1984), inspired by the classicists, evolved their own version of temperament theory.

Keirsey and Bates

Keirsey and Bates (1984) began by sorting people's behavioural tendencies into four patterns. They called these four patterns "temperaments" which were defined as a kind of thematization of the whole, a uniformity of the diverse. A more understandable definition would be, "stable patterns by which human personality interacts with the environment to satisfy its needs" (p. 27). Keirsey and Bates' Temperament theory follows Kretschmer (1925, cited in Keirsey & Bates, 1984) by initially dividing people into schizoid and cycloid groups. These are then further divided, each into two groups, the hyperaesthetic and anaesthetic schizoids and the melancholic and hypomanic cycloids.

For Keirsey and Bates (1984) temperament is "...given, not acquired; it is the inborn form of the living being" (p. 27). This inborn form can be observed by examining the essential themes and central values of the individual's personality and the patterns they form as a whole. Furthermore, temperament does not change but unfolds through a process of differentiation. They proposed that an individual's temperament results in the development of a unique set of wants, interactional patterns, needs, tendencies, motives and responses to stress. These were called "themes" and the

themes that develop from a given basic temperament possess a commonality that distinguishes them from the themes derived from the other temperaments.

The four temperaments recognised by Keirsey and Bates (1984) were, the Dionysian, Epimethean, Promethean and Apollonian. These temperaments were typified by the characters of the Greek gods. Precis of their temperament portraits follow.

Dionysian

The Dionysian "prides himself precisely (and only) on his freedom" (Keiersey & Bates, 1984, p. 33). They are characterized by having a free spirit, refusing to be bound and obligated to others. They are exciting, optimistic, light-hearted and cheerful, full of fun, bringing excitement and adventure to both the people and the environment around them. They like changing their work patterns, become restless with routine and are bored with the status quo. They are natural troubleshooters, sometimes even creating crisis in order to have a chance to troubleshoot. They are wanderers and may take off to try new adventures, but they are also loyal, willing to share and are super realists. Their language is operational and functional and they shy away from abstract ideas and theories. They enjoy randomness and trying out new things, are spontaneous, living for the moment, seeking immediate gratification and tend

towards action for its own sake. They are not only impulsive but want to be impulsive; they must act on their impulses. They love tools and see tools as an extension of themselves and have no trouble persevering in the same action for hours. They thus possess the necessary impulsive stamina to make virtuosity possible.

As a consequence they are process oriented. This results in their choosing occupations which require skills that come from an excited concentration on an activity for long periods. Occupations that demand actions and freedom to respond to the demands of the immediate moment. They are the performing artists, the magicians, the gunslingers, the firefighters, the entertainers, the instrumentalists, painters, athletes, gamblers, racers. They go where the action is.

"The (Dionysian) simply and spontaneously acts, endlessly, tirelessly, caught up and possessed by the act itself, having no end beyond the doing" (Keirse & Bates, 1984, p. 36).

Epimethean

The Epimetheans "exist primarily to be useful to the social units they belong to" (Keirse & Bates, 1984, p. 39). Characteristically they are dutiful, useful, traditional, socially responsible. They follow the given rules, upholding the law, and live by given "shoulds", "oughts" and "musts" from tradition. They need to belong to groups/units which,

for them, often become an end in themselves. Their duty is to give to, care for and to preserve. They are prepared, conserving both materially against a rainy day and against social change. They defend their heritage, maintaining the social standards against interlopers, and never venturing beyond the pale. This makes them very hierarchical and class conscious. They are never freeloaders, believing that status and prestige must be earned. They feel socially obligated to others and guilty about dependency and can be pessimistic and depressed. They use social opinion to help and guide them in controlling and harmonizing with society.

Not unexpectedly, Epimetheans are to be found in traditional or caring service occupations such as farming, medicine, nursing, administration, libraries, teaching, accounting, insurance.

Promethean

"Scratch (a Promethean), find a scientist" (Keirse & Bates, 1984, p. 48). They have a need to understand, control, predict, and explain realities. They are natural sceptics and are reluctant to accept blindly from even established authority, demanding instead concrete evidence.

Consequently, they often seem to be arrogant and individualistic. They want competencies, abilities and ingenuity and value intelligence. They must improve their performance in order to achieve competence. They are the most self critical of all styles, setting their own standards

and they alone can judge their own capability. They place exacting and stringent demands on themselves in pursuit of knowledge. To comprehend fully their area of interest is vitally important even to the point of perfectionism.

Although suffering from self doubts and a vague sense of inadequacy, they do not expect others to know much and yet, paradoxically, expect them to at least attempt to match their own standards. Tending to focus on the future, regarding the past as something dead and gone, they are still prepared to learn from the past. They love to listen to competing ideas and usually give them consideration with an open mind. They are attracted to occupations that require the formation and application of scientific principles.

Apollonian

The Apollonians "stand as a direct link between the gods and man, giving man a sense of mission, showing man how to continue in his search for the sacred even though he has known the evil of the profane" (Keirse & Bates, 1984, p. 66). They are characterized by being honest with a unique personal identity. They strive to search for the meaning of life for self and others. They pursue extraordinary goals that defy description such as "becoming" or "unity of the self". They desire intensity and intimacy in relationships to which they give generously even to the extent of incurring disappointment due to unreasonable expectations of self and others. This is due to their tendency not to set limits on their own time or energy commitments. Often intellectual

butterflies they can make themselves appear outwardly to be what others expect them to be. They emphasize interpersonal communications, and are especially aware of the subtleties of nonverbal or out of awareness communication. They like to work with words and need to communicate with others. These preferences may combine to produce a bias for dramatic writing rather than technical writing. Neither mercenary nor commercial, they seek a vocation rather than an occupation, often in caring and teaching occupations, or in ministry. Needing to have their contribution recognised by others they are often actors, preferring to become the character rather than to act the part. Since they are also their own audience for their behaviour they tend to be perfectionist in their achievements and to romanticize the experience of living.

The Apollonian is "the giver of prophecy, spokesman for the gods, the inspirer and inspirer and the inspirational, the divine and the incorruptible (Keirsey & Bates, 1984, p. 66).

Identifying the temperaments

By following Kretschmer in dividing people into schizoid and cycloid groups, Keirsey and Bates (1984) were able to equate the schizoids with Myers' "intuitives" and the cycloids with her "sensors". In this way they identified the hyperaesthetic schizoids as the MBTI intuitive feelers and the anaesthetic schizoids as the intuitive thinkers; the

melancholic cycloids as the sensing judgers and the hypomanic cycloids as the sensing perceptives.

Hypotheses

The objective of the current study was to investigate personality correlates of belief in, and involvement with paranormal phenomena. This was to be done by predicting the rank ordering of scores obtained by different groups on paranormal belief and involvement scales. Also, different methods of forming the groups would be used in order to examine the personality correlates derived from two personality theories. The first method of grouping the subjects was by using the Jungian personality dimensions. This allowed the studies by Murphy and Lester (1976) and Lester et al. (1987) to be replicated and extended. The second method was to use Keirsey and Bates' (1984) temperaments to group the subjects.

Paranormal belief and involvement

The four Jungian dimensions

It was noted earlier that three studies have linked belief in paranormal phenomena to the Jungian dimensions (Murphy & Lester, 1976; Lester et al., 1987). The current study differs from those of Lester and his co-workers by using the MBTI to assess subjects' personality and the revised Paranormal Belief Scale (Tobacyk, 1988) to measure their

paranormal beliefs. Both instruments are well established, valid, and when used as their designers intended, they are reliable.

In replicating the work of Lester and his co-workers, hypotheses were to be generated from Functional theory. When the judging pole of the J-P attitude is preferred, the tendency is towards closure or decisive action. Individuals who have developed the judging attitude like to get things settled or finished, tending to work best with plans and guidelines. They are time oriented and dislike interruptions. They are therefore likely to be intolerant of talk about anomalous phenomena and are therefore disbelieving. When the perceptive pole is preferred, the tendency is towards keeping ones options open. They prefer to procrastinate in projects rather than commit themselves to action and are flexible to changes. Being open to change and avoiding commitment they are likely to be more interested in, and curious about anomalous phenomena. Consequently, perceptives should be more believing than judgers. However, with traditional religious beliefs, the judgers, being conservative, would tend to uphold the societal standards that they were given in childhood. Perceptives would tend to lack commitment and so be less believing in traditional religion than judgers.

When the thinking pole of the T-F dimension is preferred, the tendency is for rational analytical decision making using

verifiable information. Paranormal phenomena, whether traditional or anomalous is, by definition, beyond rational comprehension and so the thinker will tend to be disbelieving. When the feeling pole is preferred, decisions are based on subjective values and interpersonal affiliations rather than critical thought. Feelers will therefore tend to accept the *spiritual* values associated with both traditional religion and anomalous phenomena. Thus, feelers should have stronger paranormal beliefs than thinkers.

People who prefer the sensing pole of the S-N dimension gather their information almost exclusively from the five physical senses with little intuitive input. Insubstantial paranormal phenomena must go unsensed and will therefore be unbelievable to the sensor. Those who tend to rely on intuition often automatically infer the existence of patterns or causes in external events. As a result they may more readily ascribe infrequent or improbable events to divine intervention or miraculous powers. Hence intuitives are expected to be more believing than sensors.

The E-I dimension determines only the focus of an individual's attention, either the outer or inner worlds, and therefore acts only *via* the other dimensions. Consequently, belief or disbelief in paranormal phenomena will not be determined by the E-I dimension and so extraverts and introverts should not differ in their degree of paranormal belief.

Because few investigations of both belief and involvement with paranormal phenomena have been reported, there was no useful guidance available for the current study. So, as a first guess it was assumed that the rank ordering of scores for involvement would be the same as for belief.

The four temperaments

In using Keirsey and Bates' (1984) temperaments to generate hypotheses, the first task was to use the MBTI to typify each subject's personality before grouping them into the four temperaments using their selection system. The behaviour of each of the four groups on some variable should then be as expected from Keirsey's portraits of their temperaments.

By distinguishing between traditional religious beliefs on the one hand and anomalous beliefs on the other and including the degree of involvement in each, four distinct variables can be investigated. Because the paranormal is a set of real or imagined phenomena which so far defies scientific explanation and is also an untraditional area to believe and be involved in, opinions on the matter would be fairly polarised. Hence the groups that Keirsey and Bates (1984) characterised as being traditional, sceptical and mystical respectively, could reasonably be expected to hold differing views.

Accordingly, Keirsey and Bates' (1984) temperament portraits were used to generate hypotheses for three of the four temperaments. As will be evident from the portraits, the fourth temperament (Dionysians) are too capricious to permit useful hypotheses to be made using the chosen variables and were consequently omitted.

For traditional beliefs, the Apollonians, being naturally religious, will have beliefs that are comparable to the traditionalist Epimetheans. Both are more likely to believe than the sceptical Prometheans. Accordingly, there should be no difference in belief scores for the Apollonians and Epimetheans and both should have higher scores than the Prometheans.

For traditional involvement, the Prometheans, being more reluctant to accept authority, will be less likely to be involved in the rituals of the traditional beliefs than the Apollonians. The Apollonians, being meaning-seekers and spiritually oriented, will be as involved as the Epimetheans who strive to maintain their traditions. Hence, there should be no difference in involvement scores for the Apollonians and Epimetheans and both should have higher scores than the Prometheans.

For anomalous beliefs, the Apollonians who are mystical and spiritual will be attracted to the spiritual values associated with some anomalous phenomena. They would thus be more

Anomalous involvement scores: Apollonian > Epimethean;
Promethean > Epimethean;
Apollonian = Promethean.

Sex differences

It was decided that an investigation of sex differences in belief and involvement would be included in the study. This decision was made for a number of reasons. Firstly, the sexes appear to be unevenly distributed on the T-F dimension (Myers & McCaulley, 1985). Secondly, the T-F dimension was the one most frequently reported as correlating with paranormal beliefs. Additionally, when reviewing the literature relating to belief in the paranormal it was noted that females tended to have stronger beliefs than males (Clarke, 1991, 1993; Haraldsson, 1981, 1985). Collectively, these three observations suggest that an interaction between sex and the Jungian dimensions might occur, this possibility should be explored. Similarly, interactions between sex and temperaments should also be investigated. There are a number of reports indicating sex differences in degree of belief in individual anomalous phenomena. For instance males have the stronger belief in extraordinary life forms (Clarke, 1991; Tobacyk & Milford, 1983) whereas females have the stronger belief in precognition and psi (Clarke, 1991; Gray, 1990). It was thought worthwhile to see if these observations were replicable in the current study.

Chapter 2. Method

Subjects

There were 417 subjects used, 178 males and 239 females. The age range was from 16 years to 87 years with a mean of 25.3 years ($SD=8.5$) and mode of 21 years. The majority of subjects (63.8%) were aged 23 years or less. They were recruited from the general university population by advertisements on University notice boards, in the Staff newsletter and by personal request at lectures. Anonymity was guaranteed and a consent form was signed by each subject. In addition to the brief description of the subject's Myers-Briggs Type Indicator (MBTI) scores and type provided, the experimenter offered to each subject an extensive interpretation of his/her MBTI scores and type. Most subjects accepted the offer.

Measures

Myers-Briggs Type Indicator (MBTI)

The MBTI is a forced choice, self-report personality inventory developed for use with a non-clinical population. It is a theoretically derived instrument, based on a modification of Jung's (1921/1974) theory of personality types (Myers & McCaulley, 1985). The modified theory describes personality using four dichotomous personality dimensions: extraversion-introversion (E-I), that is, orienting toward the outer world of things and people or the inner world of ideas and concepts; sensing-intuition (S-N), which is perceiving directly through

the five senses or indirectly via the unconscious; thinking-feeling (T-F), where one makes judgements by logical and impersonal processes in contrast to personal and subjective processes; judgement-perception (J-P), coming to a conclusion or becoming aware about something.

Since the dimensions are purportedly dichotomous, a subject can only lie on one pole or the other. For instance, on the E-I dimension, he or she can only be either an extravert or an introvert. Similarly, a subject can only be a sensor or an intuitive, a thinker or a feeler, and a perceptive or a judger. The MBTI Form "G" has 126 items, the responses to which are used to assign the subject to one or the other pole of each of the four Jungian dimensions (Myers & McCaulley, 1985). The procedure is to obtain the weighted sum of responses to each pole of a dimension and assign the subject to the pole with the higher score. Ties are resolved by assigning the subject to the I, N, F or P pole. A subject's type is determined by the particular combination of preferred poles exhibited on each of the four dimensions. These four bipolar dimensions can therefore give rise to 16 personality types, each designated by a four letter code made up of the subjects' preferred poles, e.g. ENTJ.

The MBTI manual contains a considerable amount of reliability and validity data (Myers & McCaulley, 1985). Internal reliability, assessed using split-half correlations are typically about .8, coefficient alphas are in the range .7 to

.8. Test-retest reliabilities from a number of studies range from about $r=.5$ over a four year period, through $r=.7$ over two and a half years to $r=.85$ over one week. The stabilities depend somewhat upon the dimension under consideration: the T-F dimension appears to be the least stable ($r=.48$) while E-I is the most stable ($r=.73$), both correlations were obtained over a period of 14 months (Stricker & Ross, 1964).

The MBTI manual also gives data about the intercorrelations of the scales. Theoretically, all of the scales should be independent of one another, but the evidence shows that the scales are intercorrelated to varying degrees. The correlation between the S-N and J-P is the most consistent, ranging from zero to $r=.49$, with a mean of $.33$ from 50 samples. Sensors tended to score at the judging pole while intuitives tended to score at the perceptive pole. The J-P scale was also correlated with the T-F scale but to a lesser degree than with the S-N scale. Correlations between J-P and T-F ranged from $.15$ to $.33$ with a mean of $.17$, again from a total of 50 samples. Other combinations of the scales rarely gave significant correlations and the authors concluded that the scales are essentially independent. This conclusion seems to be reasonable when the highest mean correlation between the S-N and J-P scales, represents only 10% of shared variance.

In the current study, the MBTI "G" form (1977: Consulting Psychologists Press) was used to determine to which of the 16 MBTI personality types each subject belonged. The subjects'

on each of the four MBTI dimensions were used to assign the subjects to their MBTI type. After the subjects had been assigned to one of these sixteen types using their individual type scores, they were grouped into one of the four temperaments: Promethean, Apollonian, Epimethean and Dionysian (Keirsey & Bates, 1984). Subjects with NT in their type (e.g., INTJ) were classified as Promethean. Similarly, subjects with NF in their type were classified as Apollonian. Likewise, subjects whose type contained SJ were classified as Epimethean, and those with SP in their type were classified as Dionysian. Table 1 shows the relationship between the 16 MBTI types and the four temperaments.

Table 1. The relationship between the four Keirsey and Bates' temperaments and the 16 MBTI types.

Promethean (NT)	Apollonian (NF)	Epimethean (SJ)	Dionysian (SP)
ENTJ INTJ	ENFJ INFJ	ESTJ ISTJ	ESTP ISTP
ENTP INTP	ENFP INFP	ESFJ ISFJ	ESFP ISFP

IBM compatible personal computers were used to present the MBTI items, record the subject's responses and determine their MBTI type. The MBTI questionnaire was contained on a computer disk, which included the software for presentation, instructions to the subjects, response recording, scoring and informing the

subjects of their personality type and a brief description of their types.

Traditional religious and anomalous belief measures: the revised Paranormal Belief Scale

Traditional religious beliefs (traditional beliefs) and anomalous beliefs were assessed using a pencil-and-paper version of the revised Paranormal Belief Scale (PBS, Tobacyk, 1988). The complete PBS can be found in Appendix 7. There are 26 items in the scale measuring degree of belief in each of seven phenomena: traditional belief (God, soul, devil, life after death); psi (psychokinesis, mind reading); witchcraft (witches, black magic, spells); superstition (black cats, broken mirror, the number "13"); spiritualism (astral projection, reincarnation, communication with the dead); extraordinary life forms (abominable snowman of Tibet, Loch Ness monster, life on other planets); and precognition (astrology, psychics).

When the original PBS was developed, traditional beliefs were included as a paranormal belief dimension (Tobacyk & Milford, 1983). They were included because the authors believe that religious and other anomalous beliefs originate in the same fundamental human experience and may serve similar functions. In fact, many religions share beliefs with other anomalous belief systems. For instance: communication other than by typical, normal methods; unity of the universe; duality of body

and mind/spirit/soul; afterlife or reincarnation; and, ordinary reality is not the "true" reality.

Subjects respond to the items of the PBS by deciding on how strongly they agree or disagree with each item using a seven-point scale. The response scale ranges from strongly disagree (1) through uncertain (4) to strongly agree (7). The subjects record their responses to the questionnaire on a separate answer sheet. As in the original PBS, all items except one are presented in the affirmative format e.g., "Black magic really exists". The one example (item 23) that is presented in the negative format is, " Mind reading is not possible". In the present study this was altered to "Mind reading is possible". This minor alteration came about because the subjects who took part in the pilot study commented that this item confused them. The alteration was made to avoid any possible confusion by future subjects. The subjects' score for each item is their degree of agreement with that item as indicated on the seven point scale.

The revised PBS is a well validated test instrument targeting seven clearly defined phenomena. These phenomena correspond to the items that load onto each of seven factors derived from the original item pool used in developing the original PBS (Tobacyk & Milford, 1983). When they factored the responses to the initial pool of 61 items, 13 factors appeared. However, of these 13 factors, six consisted of only single and double items, and none of them appeared to relate to any recognisable

construct or belief. The items that made up these six trivial factors were dropped leaving only 25 items that loaded onto seven recognisable factors. The items loading onto each of these seven factors make up the individual subscales of the PBS.

The original version was found to be restrictive in response range and had inadequate reliability and validity. Several items were found to be ambiguous while the subscales for witchcraft, precognition and extraordinary life forms were unreliable and their cross-cultural validity was problematic. Consequently, in an effort to improve both reliability and cross-cultural validity, Tobacyk (1988) revised several items. A further item was also added bringing to 26 the total number of items for the revised PBS.

To assess the suitability of the revised PBS for a New Zealand context, the factor structure of the subject's responses were analyzed. A principal components analysis was conducted using a seven factor solution and varimax rotation, in order to compare results with those of Tobacyk and Milford (1983).

Factor structure of the PBS

The seven factors that were extracted accounted for 62.7% of the total variance and corresponded almost perfectly to the seven subscales of the PBS (Table 2). Every item, except one, belonging to an individual subscale loaded onto its own clearly identifiable factor. This exception was item 5 (astral

Table 2. Factor loadings of the 26 item revised Paranormal Belief Scale from the present study and Tobacyk and Milford (1983).

Factor	Name	Item	Loading	
			1991	1983
1	Psi	2	.89	.79
		5	.52	-.07
		9	.86	.74
		16	.81	.69
		23	.30	-.51
2	Traditional religious belief	1	.58	.77
		8	.79	.74
		15	.81	.72
		22	.91	.78
3	Superstition	4	.65	.69
		11	.74	.76
		18	.70	.75
4	Extraordinary life forms	6	.87	.75
		13	.79	.76
		20	.37	.73 *
5	Witchcraft	3	-.70	.75
		10	-.84	.75
		17	-.63	.68 *
		24	-.87	.55 *
6	Spiritualism	5	.38	.50
		12	.48	.53
		19	.53	.72
		25	.61	.73
7	Precognition	7	-.89	.54 *
		14	-.75	.64 *
		21	-.47	-.69 *
		26	-.37	---

projection) which loaded onto the first factor, psi, instead of the sixth, spiritualism. The factor loadings were also very similar to those reported by Tobacyk and Milford (1983). The notable exceptions were the items for witchcraft and for

precognition. For these items the magnitudes of the loadings were similar between the two studies, but the direction of the loadings was reversed. Item 23, which was altered to a positive wording in the current study, loaded positively onto its factor which contrasts with the negative loading in the original (1983) study; the magnitude of the factor loading of .3 is lower than the earlier -.51 but not excessively so.

Tobacyk (Tobacyk & Milford, 1983) has reported test-retest reliabilities for the individual subscales that comprise the PBS but has given no information on the internal reliability of the PBS. So, having replicated the subscales of the PBS, the next step was to evaluate its internal reliability. However, it was argued in the Introduction (p. 5) that traditional and anomalous beliefs were different constructs. Consequently, some of the hypotheses were made using the distinction between traditional and anomalous beliefs. Hence, the revised PBS was divided into two subscales, traditional and anomalous beliefs. Assessing the reliabilities of these two subscales was necessary in addition to assessing the reliability of the entire PBS.

Reliability of traditional and anomalous beliefs subscales

Coefficient Alpha and item-total correlations were used to evaluate the internal consistency of the revised PBS and the two subscales (Table 3 below). The four items of the tradition belief subscale, had item-total correlations ranging from .57 to .80 and an alpha of .87. This range of values indicates

Table 3. Coefficient Alpha and individual item-total correlations for the revised PBS, the traditional beliefs subscale and the anomalous beliefs subscale.

Items	Item content	Subscale item-total correlation	PBS item-total correlation
Traditional belief			
1	Soul	0.574	0.502
8	Devil	0.750	0.414
15	God	0.761	0.350
22	Heaven/Hell	0.803	0.389
	Alpha	0.868	
Anomalous belief			
2	Levitation	0.679	0.660
3	Black magic	0.525	0.584
4	Black cat	0.336	0.317
5	Astral projection	0.678	0.655
6	Abominable Snowman	0.362	0.340
7	Astrology	0.523	0.463
9	Psychokinesis	0.761	0.693
10	Witches	0.420	0.469
11	Broken mirror	0.370	0.335
12	Astral projection	0.702	0.686
13	Loch Ness Monster	0.387	0.377
14	Horoscope	0.491	0.428
16	Psychokinesis	0.716	0.674
17	Spells	0.554	0.577
18	Number 13	0.347	0.338
19	Reincarnation	0.538	0.461
20	Life on other planets	0.147	0.052
21	Psychics	0.615	0.565
23	Mind reading	0.599	0.582
24	Witchcraft	0.518	0.561
25	Deceased communication	0.600	0.597
26	Precognition	0.621	0.597
Alpha		0.906	0.903

that all of the items tap the same construct. For all four items, the item-total correlations for the subscale are considerably higher than the item-total correlations with the

full revised PBS. In contrast, there is little change from the item-total correlations for the anomalous belief subscale and the corresponding item-total correlations for the entire revised PBS. Any differences appeared solely in the third decimal place. Furthermore, the product moment correlation between the traditional belief and anomalous belief subscales ($r=.32$) shows that the two subscales have only 10% of shared variance.

Separating the revised PBS into a traditional belief subscale and an anomalous beliefs subscale was supported by the item-total correlations and coefficient alphas that were found when the full scale was so divided. Overall, the psychometric properties and common sense support the idea that traditional beliefs are conceptually distinct from anomalous beliefs.

With one exception, item-total correlations for the anomalous belief subscale ranged from 0.35 to 0.76. There were two groups of items with consistently lower values. These were the three items (4, 11, 18) for superstition and the three items for extraordinary life forms (6, 13, 20); item 20, (There is life on other planets.) had an item-total correlation of 0.05. However, when each of these items was removed in turn from the subscale, the resulting coefficient alpha differed from the total subscale coefficient alpha only in the third decimal place. The item-total correlation for Item 23, "Mind reading is possible", which was presented in a positive form, was comparable to the other items (2, 9, 16) relating to the psi

subscale. Considering the diversity of the items, this can be considered to be an acceptable range of values.

Paranormal Involvement Scale

Construction of the Paranormal Involvement Scale

Involvement with paranormal phenomena was assessed with a pencil-and-paper questionnaire, the Paranormal Involvement Scale which was devised for this study. Several pilot scales were developed before the final version was produced. A total of 27 subjects took part in the pilot studies. These subjects were recruited from among the staff and graduate students of the Massey University Psychology Department, and a few personal friends and relatives.

Since it was a newly created scale, the development of the Paranormal Involvement Scale is described fully in Appendix 1, where details of the different versions of the scale can also be found. The initial pilot scale consisted of two subscales, an involvement with traditional religious phenomena subscale (traditional involvement) and an involvement with anomalous phenomena subscale (anomalous involvement). The traditional involvement subscale consisted of 9 items derived from Haraldsson (1981). Some of the items asked about religious activities while others asked about religious or spiritual experiences. Responses were made using either a three or four point response scale.

The anomalous involvement subscale consisted of 10 items tapping 10 anomalous phenomena corresponding to items in the revised PBS. Each anomalous phenomenon was described by a definition derived from Messer and Griggs (1989) or from Mishlove (1975). There were 19 items altogether. A five-point response scale based on the four choice response set of Messer and Griggs was used.

Seven subjects answered the questionnaire and the comments solicited from them were used to refine the scale thereby producing a second version of the Paranormal Involvement Scale. The testing and refinement procedure was repeated several times until the final version of the Paranormal Involvement Scale was produced.

The final form of the Paranormal Involvement Scale consisted of 14 items. One item consisted of a statement about traditional religious phenomena; it was accompanied by a set of seven statements indicating different degrees of involvement with traditional religious phenomena. The remaining 13 items covered the anomalous phenomena: psychokinesis, telepathy, witchcraft, superstition, astral projection, reincarnation, spiritualism, extraordinary life forms, extraterrestrial visitation, astrology, precognition, Tarot cards and biorhythms. Other than biorhythms, all items related the paranormal phenomena covered by the revised PBS. Each item relating to the anomalous phenomena consisted of a definition of that phenomena accompanied by a set of seven statements

indicating differing degrees of involvement with that phenomenon. The statements accompanying the 14 items of the Paranormal Involvement Scale effectively formed a seven-point response scale. Subjects chose the statement that best fitted their experience with the phenomenon and recorded their choice on the same sheet that was used for responding to the revised PBS. Taking telepathy as an example:

Telepathy is the direct communication of thoughts from mind to mind without the use of normal senses.

1. I have never heard of telepathy.
2. I know what telepathy is but don't concern myself with it.
3. I have on occasion read books or articles about telepathy.
4. I actively seek information about telepathy.
5. I myself have experienced telepathy.
6. Both 3 and 5.
7. Both 4 and 5.

Reliability of the Paranormal Involvement Scale

The number of the response option chosen for each item was taken as the degree of involvement with that particular phenomenon. The sum of the choices for the individual items gave the individual anomalous involvement score.

There was only one item relating to traditional involvement so no internal reliability was possible. The remaining 13 items formed the anomalous involvement subscale. Coefficient alpha for the 13 items anomalous involvement subscale was 0.768. The item-total correlations for the anomalous involvement subscale, shown in Table 4 below, were rather more varied than those for the corresponding PBS items. Nine of the items gave correlations lying above 0.37 but four had lower values.

Superstition, extraordinary life forms and extraterrestrial visitations all had correlations that were close to 0.2 while belief in biorhythms had a value close to 0.3. When each item in turn was dropped from the subscale, the subsequent value for coefficient alpha differed from the full-subscale alpha only in the second decimal place. Therefore, although the item-total correlations for these items were low they were retained since dropping them would have eliminated two of the anomalous phenomena covered by the revised PBS.

Table 4. Anomalous involvement subscale. Item-total correlations and coefficient alpha.

Item	r
Psychokinesis	.50
Telepathy	.58
Witchcraft	.45
Superstition	.20
Astral projection	.53
Reincarnation	.51
Spiritualism	.44
Extraordinary life forms	.23
Extraterrestrial visits	.19
Astrology	.38
Precognition	.46
Tarot cards	.42
Biorhythms	.29
Alpha	.77

Product moment correlations were calculated between scores on the single item for traditional involvement and the anomalous involvement subscales and also between these two subscales and the two PBS subscales, traditional belief and anomalous belief. The correlation between traditional belief scores and

traditional involvement scores was moderate ($r=.61, p<0.01$) as was the correlation between anomalous belief and anomalous involvement scores ($r=.60, p<0.01$). For both traditional and anomalous phenomena there was only 36% of shared variance between belief and involvement. This supports the idea that belief and involvement are related but distinct constructs, that is, neither construct necessarily entails the other.

The correlations between traditional belief and anomalous involvement, anomalous belief and traditional involvement, and between traditional involvement and anomalous involvement, were all close to zero. The lack of cross correlation between the traditional subscales and the anomalous subscales supports further the idea that traditional phenomena are conceptually distinct from anomalous phenomena.

Ethics

Before commencing the main study, the project was submitted to the University Human Ethics Committee. They approved the proposal subject to the anonymity of the subjects being safeguarded and their being able to withdraw at any time in accordance with the N.Z. Psychological Society code of ethics.

Procedure

The study was conducted during the first two weeks of the academic year in the Psychology Department computer teaching laboratory. Subjects reported on their own initiative to the laboratory during the allotted times. Although up to 17

subjects could be accommodated at any one time, a queue often formed at the laboratory door. The experimenter welcomed each subject who was given a brief description of the experimental procedure. Provided that the subject wished to proceed, he or she was then asked to sign a standard departmental consent form and deposit it into a consent form tray anonymously. The subject was then given the paper questionnaire booklet and a separate response sheet and seated in front of a computer terminal and keyboard. Each subject was asked to follow the instructions in the questionnaire booklet; they were also asked to give information about their sex and age. Each subject was to complete the Paranormal Involvement Scale and the revised PBS before commencing the MBTI on the computer. The subjects were requested to answer all items to the best of their ability and were told that the experimenter could not aid in giving any additional definition of terms. Each subject was told that they could terminate doing the questionnaire at any time if they felt uncomfortable with any part of the procedure. Instructions for accessing the MBTI computer programme were printed at the end of the questionnaire. After completing the MBTI, the computer displayed the subject's score on each of the four MBTI scales along with their MBTI personality type and type description. The subjects copied these scores and their type onto the questionnaire response sheet which was then deposited into a response sheets tray. At the subject's request, the experimenter then gave a personality interpretation to the subject and answered any question raised by the subject.

Chapter 3. Results

There were two sets of independent variables. One set was the polar preferences on the Jungian dimensions identified by using scores on the MBTI. The other set were the subjects' temperament as identified by using Keirsey and Bates' (1984) scheme for grouping the Myers-Briggs Type Inventory (MBTI) type. The dependent measures were the scores for traditional belief, anomalous belief, traditional involvement and anomalous involvement. All analyses of these variables were conducted with SPSS.PC 5.0 (Norusis, 1992). Two tailed tests were used with *alpha* set at 0.05 for all analyses. Sixteen incomplete questionnaires were returned leaving a total of 401 subjects for analysis: 171 (42.6%) male and 230 (57.4%) female.

Frequency distributions

Distribution of types

The subjects were distributed unevenly among the poles of the dimensions, as shown in Table 5. More subjects scored at the introverted pole of the extraversion-introversion (E-I) dimension than at the extraverted pole. Similarly, more scored at the intuitive pole of the sensing-intuitive (S-N) dimension than at the sensing pole. The subjects were evenly distributed on the thinking-feeling (T-F) and judgement-perception (J-P) dimensions.

Table 5. Sample distribution on the poles of the Jungian dimensions.

Dimension	Pole	N	%
Extraversion- introversion	Extraversion	166	41.4
	Introversion	235	58.6
Sensing- intuitive	Sensing	146	36.4
	Intuitive	255	63.6
Thinking- feeling	Thinking	201	50.1
	Feeling	200	49.9
Judging- perceiving	Judging	192	47.9
	Perceiving	209	52.1

Distribution of temperaments

The MBTI types were then used to allocate the subjects to their appropriate temperament. All subjects with NT in their MBTI type were classified as Promethean. Similarly, NFs were classified as Apollonian, SJs as Epimethean and SPs as Dionysian. As Table 6 shows, the sample contained approximately equal numbers of NFs and NTs, rather fewer SJs and noticeably fewer SPs.

Table 6. Sample distribution of temperaments.

Temperament	Sample %
Promethean (NT)	28.8
Apollonian (NF)	34.7
Epimethean (SJ)	22.3
Dionysian (SP)	12.7

Distribution of the sexes

The temperaments were distributed unevenly among the sexes,

chi-squared(3, $N=401$)=13.39, $p<0.005$ (Table 7). Females were over represented among the Apollonians comprising 41.7% of the female sample, whereas Apollonians as a whole provided only 34.7% of the entire sample. Males were over represented among the Prometheans, but to a lesser extent. Promethean males provided 34.5% of the male sample but there were only 28.8 % of Prometheans in the study.

Table 7. Temperament distribution among Males and Females.

Temperament	Number (% of cases)		Sample total (%)
	Male	Female	
Promethean	59 (50.9%)	57 (49.1%)	116 (28.9)
Apollonian	43 (30.9)	96 (69.1)	139 (34.7)
Epimethean	47 (50.5)	46 (49.5)	93 (23.2)
Dionysian	22 (41.5)	31 (58.5)	53 (13.2)

Analytical comparisons revealed that the uneven distribution of Apollonians between the sexes was significant, chi-squared(1, $N=139$)=7.80, $p<0.01$, whereas that of the Prometheans was not, chi-squared(1, $N=116$)=3.22, n.s.

The uneven distribution of the sexes among the temperaments was due primarily to the distribution of the sexes on the T-F dimension. This was seen when the sex distribution across the four dimensions was examined; it was found that only on the T-F dimension were the sexes unevenly distributed to a significant

extent, chi-squared (1, $N=401$)=15.17, $p<0.0001$. 67% of females were assigned to the feeling pole whereas the two sexes were evenly distributed on the thinking pole (Table 8).

Table 8. % distribution of male and female subjects on the T-F dimension.

Pole	Number (% of cases)		
	Male (%)	Female (%)	Total (%)
Thinking	105 (52.2%)	96 (47.8%)	201 (51.1)
Feeling	66 (33.0%)	134 (67.0%)	200 (49.9)

Summary statistics of the dependent measures

Summary statistics for the scores on the four dependent measures: traditional belief, anomalous belief, traditional involvement, and anomalous involvement are shown in Table 9.

Table 9. Mean and SDs, median and mode for scores on traditional belief, anomalous belief, traditional involvement, and anomalous involvement.

Measure	Mean (SD)	Median	Mode
Traditional belief	4.50 (1.73)	4.50	7.00
Anomalous belief	3.52 (0.94)	3.55	3.73
Traditional involvement	4.01 (1.91)	3.00	2.00
Anomalous involvement	2.83 (0.59)	2.73	2.62

The distribution of scores for traditional belief, anomalous belief and anomalous involvement were approximately normal. However, scores on traditional involvement were essentially bimodal (Table 10).

Table 10. Distribution of scores on traditional involvement.

Score	1	2	3	4	5	6	7
Number of cases	5	125	102	8	45	72	60

The Jungian dimensions

The four dependent measures

It was hypothesized that feelers would have higher belief scores than thinkers for both traditional belief and anomalous belief. Similarly, intuitives would have higher belief scores than sensors for both traditional belief and anomalous belief. However, judgers were expected to have the higher scores on traditional belief while perceptives would have the higher scores on anomalous belief. No differences were expected between extroverts and introverts on either belief subscale. Scores on the traditional and anomalous involvement subscales were expected to follow the same pattern as for belief scores. Accordingly the differences between the mean scores on the experimental measures for the two poles of each dimension were subjected to a t test for independent samples. The results are shown in Table 11.

Table 11. Mean scores and SDs on traditional belief, anomalous belief, traditional involvement, and anomalous involvement for the poles of the four Jungian dimensions.

Pole	Traditional belief		Anomalous belief		Traditional involvement		Anomalous involvement	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
E	4.31	(1.81)	3.47	(1.04)	3.96	(1.87)	2.86	(0.61)
I	4.69	(1.68)	3.54	(0.87)	4.06	(1.95)	2.80	(0.58)
	$\underline{t}=2.13^*$		n.s.		n.s.		n.s.	
S	4.63	(1.69)	3.47	(0.86)	3.98	(1.86)	2.69	(0.55)
N	4.48	(1.78)	3.53	(0.99)	4.04	(1.95)	2.90	(0.60)
	n.s.		n.s.		n.s.		$\underline{t}=3.55^{***}$	
T	4.08	(1.71)	3.33	(0.97)	3.67	(1.81)	2.82	(0.58)
F	4.99	(1.66)	3.69	(0.89)	4.36	(1.97)	2.83	(0.60)
	$\underline{t}=5.41^{***}$		$\underline{t}=3.85^{***}$		$\underline{t}=3.65^{***}$		n.s.	
J	4.55	(1.72)	3.39	(0.97)	4.15	(1.95)	2.76	(0.58)
P	4.52	(1.77)	3.63	(0.91)	3.89	(1.88)	2.88	(0.60)
	n.s.		$\underline{t}=2.54^*$		n.s.		$\underline{t}=1.99^*$	

* $p < 0.05$. *** $p < 0.001$.

The clearest evidence for differences between the poles of the various dimensions was given by the T-F dimension. On three of the four measures, subjects identified as feelers had higher scores than thinkers, with anomalous involvement being the exception. Perceptives also tended to have higher scores than judgers, but this only occurred for the two anomalous subscales, belief and involvement. Two other differences were found, intuitives had higher anomalous involvement scores than sensors; introverts had higher traditional belief scores than extraverts.

Correlations between the dimensions and belief in the individual scales of the revised PBS

Lester et al. (1987) reported product moment correlations between scores on the four Jungian dimensions and belief scores for the individual phenomena of the original PBS. A similar analysis was carried out for the current study so that a fairly direct comparison could be made with their results.

There were significant correlations between traditional belief subscale of the revised PBS with both the E-I dimension, $r=0.16$, $p<0.01$, and with the T-F dimension, $r=0.28$, $p<0.001$.

Significant correlations were found for the J-P and T-F dimensions, both dimensions were correlated with psi, witchcraft, spiritualism and precognition (Table 12).

Table 12. Product moment correlations between the four Jungian dimensions and belief in the six anomalous phenomena.

Phenomenon	Dimension			
	J-P	E-I	S-N	T-F
Psi	.19**	-.04	.06	.22**
Witchcraft	.13*	-.05	.07	.22**
Superstition	.10	-.02	-.09	.12
Spiritualism	.20**	-.04	.13	.17*
Ext.ordin. Life forms	.01	.07	-.01	-.01
Precognition	.14*	-.07	.05	.16*

* $p<0.01$. ** $p<0.001$.

Keirsey and Bates' temperaments and the dependant measures

Using Keirsey and Bates' (1984) temperament portraits it was hypothesized that certain temperaments would have higher mean scores on the four experimental measures than other temperaments. Specifically:

Traditional belief scores: Apollonian > Promethean;
Epimethean > Promethean;
Apollonian = Epimethean.

Traditional involvement scores: Apollonian > Promethean;
Epimethean > Promethean;
Apollonian = Epimethean.

Anomalous belief scores: Apollonian > Promethean;
Apollonian > Epimethean;
Epimethean = Promethean.

Anomalous involvement scores: Apollonian > Epimethean;
Promethean > Epimethean;
Apollonian = Promethean.

One-way ANOVAs for each dependent variable followed by planned contrasts showed that all hypotheses were supported.

Temperament mean scores on the four measures are listed in Table 13, below.

Traditional belief

The ANOVA indicated significant differences among the mean scores for the temperaments, $F(3,396)=8.26$, $p<0.0001$. Planned contrasts showed that the scores for the Prometheans were significantly lower than both the Apollonians, $t=-4.88$, $p<0.0001$, and the Epimetheans, $t=-3.27$, $p<0.001$. Also, the scores for the the Apollonians did not differ from those for the the Epimetheans, $t=1.2$, n.s.

Table 13. Mean scores and SDs on traditional belief, anomalous belief, traditional involvement, and anomalous involvement for each temperament.

Temperament	Trad- itional belief	Anom- alous belief	Trad- itional invol- vement	Anom- alous invol- vement
	mean (SD)	mean (SD)	mean (SD)	mean (SD)
Promethean (NT)	3.91 (1.72)	3.27 (1.02)	3.51 (1.80)	2.89 (0.61)
Apollonian (NF)	4.94 (1.69)	3.75 (0.91)	4.45 (1.99)	2.92 (0.60)
Epimethean (SJ)	4.68 (1.69)	3.37 (0.87)	4.15 (1.87)	2.64 (0.52)
Dionysian (SP)	4.34 (1.71)	3.65 (0.83)	3.69 (1.82)	2.76 (0.60)

Anomalous belief

The ANOVA indicated that the temperament mean scores were significantly different, $F(3,293)=6.69$, $p<0.0002$. Planned contrasts showed that in this case the Apollonians had significantly higher scores than either the Prometheans, $t=-4.09$, $p<0.0001$ or the Epimetheans $t=3.04$, $p<0.005$. At the same time, scores for the the Prometheans and the Epimetheans did not differ, $t=1.15$, n.s.

Traditional involvement

Again, the ANOVA showed that the scores for traditional involvement were also different, $F(3,397)=5.58$, $p<0.001$. The contrasts showing that the Prometheans had lower scores than

both the Apollonians $\underline{t}=3.81$, $p<0.0001$ and the Epimetheans $\underline{t}=3.49$, $p<0.001$, while scores for the the Apollonians and the Epimetheans did not differ, $t=0.77$, n.s.

Anomalous involvement

Finally, the scores for anomalous involvement were also significantly different, $F(3,396)=4.74$, $p<0.005$; the Epimetheans having lower scores than either the Apollonians, $\underline{t}=3.49$, $p<0.001$, or the Prometheans, $\underline{t}=2.98$, $p<0.005$. In this case, the scores for the the Apollonians did not differ from those for the the Prometheans, $\underline{t}=0.42$, n.s.

Sex differences

Sex differences on the four dependent measures

It was noted earlier that differences between the sexes had been reported for paranormal beliefs. To test these reports, the mean scores for the two sexes were compared on each of the dependent measures using two tailed \underline{t} tests. Females scored significantly higher than males on both belief subscales, but the sexes did not differ in their involvement scores (Table 14, below).

Interactions between sex and the Jungian dimensions

To investigate any possible interactions between sex and the four Jungian dimensions, two-way Sex x Dimension ANOVAs were carried out for each dimension on each of the four dependent measures. Only the J-P dimension produced significant

Table 14. Mean scores and SDs for traditional belief, anomalous belief, traditional involvement, and anomalous involvement for males (M) and females (F).

	Traditional belief	Anomalous belief	Traditional involvement	Anomalous involvement
Sex	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
M	4.20 (1.74)	3.35 (0.96)	3.82 (1.82)	2.78 (0.60)
F	4.81 (1.68)	3.65 (0.91)	4.15 (1.97)	2.87 (0.58)
	$t=3.65$ ***	$t=3.28$ ***	n.s.	n.s.

*** $p < 0.001$.

interactions. There was a significant Sex x JP interaction for both anomalous belief, $F(2,391)=5.97$, $p < 0.02$, and for anomalous involvement, $F(2,391)=6.57$, $p < 0.01$. In both cases the interaction was due mainly to the low scores for males who were identified as judges (Figure 1).

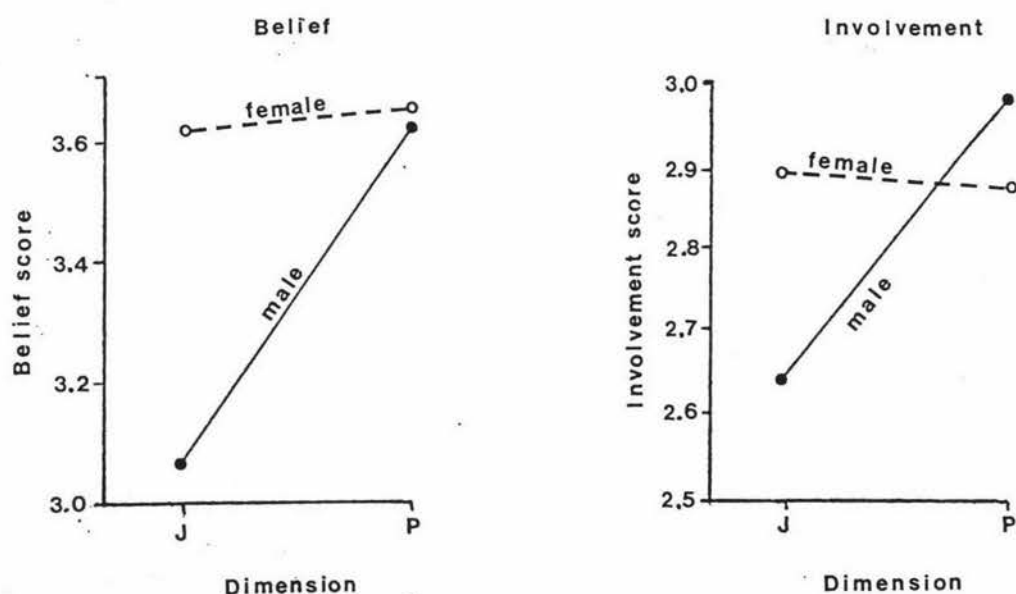


Figure 1. Interactions between Sex and the J-P dimension on anomalous belief and involvement.

Interactions between sex and the four temperaments

To investigate any possible interactions between sex and the four temperaments, two-way Sex x Temperament ANOVAs were carried out for each temperament on each of the four dependent measures. There were no significant or near significant interactions between sex and temperament.

Sex differences in beliefs in individual anomalous phenomena

Independent t tests were carried out between the sexes on the mean anomalous belief scores for each of the six anomalous phenomena (Table 15).

Table 15. Mean belief scores and SDs, as a function of Sex, for six anomalous phenomena.

Phenomenon	Male	Female	t
	Mean (SD)	Mean (SD)	
Psi	3.57 (1.50)	4.06 (1.39)	-3.44 ***
Witchcraft	3.70 (1.53)	4.02 (1.53)	-2.07 *
Superstition	1.63 (0.87)	1.73 (0.91)	n.s.
Spiritualism	3.46 (1.51)	3.93 (1.44)	-3.42 ***
Extraordinary life forms	4.01 (1.17)	3.70 (1.10)	2.78 **
Precognition	3.45 (1.25)	3.99 (1.24)	-4.40 ****

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$. **** $p < 0.0001$.

Males had significantly higher scores than females for extraordinary life forms, while females had significantly

higher scores than males for four phenomena, psi, witchcraft, spiritualism and precognition. There was no difference between the sexes in scores for superstition.

Sex differences and involvement with individual anomalous phenomena

Independent t tests were carried out between the sexes on the mean anomalous involvement scores for each of the six anomalous phenomena (Table 16).

Table 16. Mean involvement scores and SDs, as a function of Sex, for seven anomalous phenomena (including Biorhythms).

Phenomenon	Male	Female	t
	Mean (SD)	Mean (SD)	
Psi	2.86 (0.95)	2.71 (0.91)	1.56 n.s.
Witchcraft	2.61 (0.85)	2.70 (0.88)	-1.06 n.s.
Superstition	2.80 (1.32)	3.18 (1.47)	-2.70 **
Spiritualism	2.65 (0.93)	2.86 (0.99)	-2.20 *
Extraordinary life forms	2.96 (0.47)	2.73 (0.50)	4.66 ****
Precognition	3.01 (0.98)	3.34 (0.96)	-3.44 ***
Biorhythms	2.14 (1.01)	1.92 (0.95)	2.33 *

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$. **** $p < 0.0001$.

Males and females did not differ in their involvement scores for either psi or witchcraft. However males had significantly higher scores than females for extraordinary life forms, while

females had significantly higher scores than males for superstition, spiritualism, and precognition.

Sex differences and intercorrelations between belief and involvement with the individual anomalous phenomena

When evaluating the construct validity of the Paranormal Involvement Scale, its correlation with the revised PBS was determined. The correlation of .6 indicated that there was a fair correspondence between belief and involvement with the anomalous. However, it was possible that this correspondence might vary considerably across the individual anomalous phenomena for the two sexes. To test for this possibility, product moment correlations were obtained for the two sexes, separately, between the belief and involvement scores for the individual anomalous phenomena. The correlations were moderate, (range .30 to .64) and all were significant at $p < 0.001$; the values were very similar for the two sexes.

Chapter 4. Discussion

Recapitulation

The search for personality correlates of believers and non-believers in paranormal phenomena has interested researchers in the paranormal field for quite sometime. Research into these correlates has been substantial, an opinion that is shared by Irwin (1993). Irwin noted a number of outstanding issues that were of concern to the researchers in the area. These issues included the still debatable scope of the paranormal and the related issue of the dimensionality of the paranormal. These, together with varied definitions for individual phenomena, in turn led to the absence of standardized questionnaires and response scales, the use of unvalidated instruments and incommensurable rating scales. Irwin considered that the direction of research had also been influenced by a general negative bias due mainly to researchers' own subjective views regarding the reality of paranormal phenomena.

In the introduction, Irwin's (1993) conclusions were further developed. There it was argued that belief and involvement should be regarded as separate issues as should the distinction between traditional (religious) and anomalous phenomena. It was also argued that the difficulty of characterizing the paranormal believer was due to researchers' adopting implicit theories of personality giving rise, collectively, to an incoherent patchwork of personality correlates of paranormal belief. It was further argued that the remedy for this

situation required the adoption of an explicit personality theory which would concurrently specify the personality characteristics that could be correlated with belief. Furthermore, an appropriate choice of theory should allow the reasons for belief to be explicated.

Consequently, the current study was primarily an investigation of the personality correlates of belief in, and involvement with paranormal phenomena. Specifically, the MBTI was used to investigate correlates derived from Jung's (1921/1974) Functional theory of personality and correlates derived from Keirsey and Bates' (1984) Temperament theory of personality.

In addition, the current study was, in part, an attempt to remedy some of the short-comings of previous research that attempted to correlate individual personality characteristics with belief in paranormal phenomena. A well validated and reliable test instrument, the revised PBS (Tobacyk, 1988), measuring traditional beliefs and six other anomalous phenomena, was used to assess subjects' beliefs. The scope of earlier work linking personality to paranormal beliefs was extended to include the behaviours associated with such beliefs. This was done by developing and validating a Paranormal Involvement Scale. The design of this scale was modeled on the revised PBS, providing clear definitions of the same anomalous phenomena.

Methodological overview

The revised PBS was standardized using a university sample in New Zealand and found to be both reliable and valid. Factor analysis yielded seven factors that were almost identical to those of the original PBS. All items, except one, loaded onto factors, each of which were uniquely identified with an individual paranormal phenomenon. The exception was astral projection which loaded onto psi instead of Tobacyk's original factor of spiritualism. The reason for this exception could be that this New Zealand sample has a different linguistic interpretation of and/or understanding of the term "astral projection" compared to the American sample. Alternatively, the term psi may have broader connotations in New Zealand society. This possibility can be seen when it is noted that the first extracted factor, psi, accounted for 30% of the total variance. This figure is almost high enough to suggest that a general factor, psi, is present and this may be why astral projection was loaded onto psi for the New Zealand sample. However, the other factor loadings were sufficiently comparable to the original PBS loadings to discount the idea that, in New Zealand, the paranormal is a unitary concept. Since both common sense and empirical data suggested that paranormal beliefs can be distinguished into two sets of belief, traditional and anomalous beliefs, two subscales were distinguished, the traditional subscale and the anomalous subscale.

The Paranormal Involvement Scale, which was found to be reliable and valid, correlated well with the revised PBS. The anomalous involvement subscale had 13 items to tap six anomalous phenomena: psi, witchcraft, superstition, spiritualism, extraordinary life forms, and precognition. In contrast, the traditional involvement subscale had only one item. Hence, with only one item, the reliability of this subscale could not be assessed. Other than having an uneven number of items for each phenomenon, the items resembled those of the revised PBS. Biorhythm was the only phenomenon included in the Paranormal Involvement Scale that was not covered by the revised PBS.

The present study contained two sets of hypotheses. The first set sought to relate belief and involvement with paranormal phenomena to the Jungian personality dimensions. The second set sought a similar relationship between belief in, and involvement with paranormal phenomena and Keirsey and Bates' (1984) four temperaments.

The Jungian dimensions

Jung described personality using four bipolar dimensions: extraversion-introversion (E-I), sensing-intuition (S-N), thinking-feeling (T-F) and judgement-perception (J-P). Individuals can be assigned to one or the other pole of each dichotomous pair. This allows them to be described as extraverts or introverts, sensors or intuitives, thinkers or

feelers, and, judgers or perceptives. In the current study, the descriptions of the behaviours associated with the various poles (Jung, 1921/1974; Lawrence, 1982; Myers & McCaulley, 1985) were used to generate hypotheses regarding the rank ordering of scores for belief in, and involvement with para-normal phenomena by individuals assigned to polar opposites.

Traditional and anomalous belief and the Jungian dimensions

Briefly, feelers and intuitives were expected to have higher scores than their polar opposites on both the traditional belief subscale and the anomalous belief subscale. However, perceptives and judgers were expected to have different orders across the two subscales. Judgers were expected to have the higher traditional belief scores whereas perceptives were expected to have the higher anomalous belief scores.

Extraverts and introverts were not expected to differ in their scores on either measure.

The current study found that for traditional belief only one of the hypotheses on dimensions was supported. Subjects who were feelers had higher mean scores on the traditional belief subscale than thinkers. The remaining hypotheses were not supported, introverts having higher mean scores than extraverts while scores on the other two dimensions, S-N and J-P, showed no difference between the poles. However, when the difference in means were examined, mean scores for extraverts and introverts differed by less than 0.4 of a scale unit, whereas the thinkers and feelers scores differed by almost a full scale

unit. Thus the evidence for a difference between extraverts and introverts is not strong.

The higher scores for introverts may be a result of changes in social attitudes toward traditional beliefs. Extraverts always act when in doubt, which may tend to cause them to follow the reported decline in the influence of traditional beliefs (Webster and Perry, 1989). Introverts prefer to consider issues more deeply and are therefore slower to accept changes in the social climate.

At the same time, it should be noted that all groups scored at or above the scale mid-point of four. This indicates that this sample of subjects was more inclined to adhere to traditional beliefs than to reject them. This is contrary to the results of the study by Webster and Perry (1989) who reported that traditional beliefs appeared to be on the decline in New Zealand. Among the general population, they found that less than one third of the households surveyed adhered to traditional beliefs.

The hypotheses were all supported on the anomalous belief subscale except on the S-N dimension. Both feelers and perceptives had higher scores than their polar opposites and there was no difference between extraverts and introverts. However, the differences between the means were small, 0.33 scale units for the T-F dimension and 0.24 for the J-P dimension, so the support for the hypotheses is not strong.

Also, unlike the means on the traditional belief subscale, the mean scores on all dimensions were less than the scale midpoint of four. Clearly for this sample, belief in the anomalous phenomena is not as strong as traditional beliefs. This feature of the results may be due to social desirability influence.

Even though anonymity was guaranteed there was face-to-face contact with the experimenter and perceived social desirability may have been operating. Clarke (1991) suggested that a greater proportion of his sample as compared to that of Wester and Perry (1989) admitted to a belief in reincarnation because he used mailed questionnaires whereas Wester and Perry used face-to-face interview technique. He explained this difference as being due to the subjects' reluctance to be identified as believing in reincarnation, as such a belief is perceived as superstition in Western cultures. The same reasoning can be applied to the results of the current study because anomalous phenomena are often considered to be superstitious beliefs and therefore not acceptable, especially in academic settings. In fact, belief in anomalous phenomena has been actively discouraged in some academic institutions (Messer & Griggs, 1989). These authors were alarmed to find such widespread beliefs in anomalous phenomena in their sample of university students and stressed that strategies should be put in place to combat such beliefs and foster critical thinking. They reported that some institutions went as far as using techniques like hoaxing in order to combat such "irrational beliefs".

However, if believing in paranormal phenomena is primarily a result of individuals' preference for one particular way of decision making, that is, the subjective way, then teaching critical thinking skills alone may only, at best, produce a short term effect. Also, it might generate such negative feelings towards the researcher that such beliefs will even be more rooted

Traditional and anomalous involvement and the Jungian dimensions

Since paranormal involvement has been a rather neglected area in paranormal research, there was little in the literature to act as a guide to generate hypotheses. Irwin (1993) suggested that belief and involvement may be mutually reinforcing. If someone believes in a phenomenon, it is likely that he or she will be involved in it. Hence, it was intuitively expected that feelers and intuitives would again to have higher scores than their polar opposites on the traditional involvement subscale. Judges were expected to have higher traditional involvement scores but lower anomalous involvement scores than perceptives. Extraverts and introverts were not expected to differ in their scores on either measure.

For traditional involvement, two of the hypotheses were supported. Feelers scored higher than thinkers while there was no difference between extraverts and introverts.

For anomalous involvement three of the hypotheses were also supported. Intuitives and perceptives were more involved than their polar opposites and again there was no difference between extraverts and introverts.

Considerations, cautions and assessments of functional theory

Overall, there are some surprising features to these results. It was hypothesized that, across the dimensions, involvement with paranormal phenomena would have a similar pattern to paranormal belief. This was borne out, in part, for the T-F dimension where the feelers had the higher scores for both traditional belief and involvement. However, there was no difference between the thinkers and feelers for anomalous involvement even though the feelers had the higher scores on anomalous beliefs. The absence of any difference in anomalous involvement between feelers and thinkers is contrary to the trend of their scores on the other three subscales which produced the largest differences between scores in the entire study. There is no apparent reason for this outcome to be found in Functional theory.

Another unexpected result was the differential behaviour of the sensors and intuitives on the anomalous subscales. This also cannot be explained by Jungian Functional theory. Differential outcomes could be anticipated for the J-P dimension between the traditional and anomalous subscales but there is nothing in the theory to account for differential scores within any one class of subscale. Unless this outcome can be replicated, it might

be better to consider that this instance is purely fortuitous, especially when the expected differences between the poles on the other subscales were not borne out. Explaining these other failures to support the hypotheses may be the more important task.

It might be thought that a possible alternative account for the failure to find any difference between the scores for the thinkers and feelers for anomalous involvement might be found in social desirability forces. Thinkers and feelers may both be reluctant to be seen as being involved with paranormal phenomena. But, if this were the case, social desirability should also have acted on both intuitives and perceptives. However, both were more involved than their polar opposites.

The outcomes for the J-P dimension demonstrate that extending the investigation to include involvement was a worthwhile exercise. The differential hypotheses made regarding the scores on the traditional and anomalous subscales for the J-P dimension were supported, albeit not as strongly as was expected. The expected change in rank order between the poles on the traditional and anomalous subscales appeared as reduction in the differences between the perceptives and judges when the focus shifted from the anomalous to the traditional subscales. This was in the expected direction but not to the extent that was anticipated.

The difference between judges and perceives was due to an interaction between the J-P dimension and Sex, where the male judges had disproportionately lower anomalous belief and involvement mean scores than either the male perceives or females of either pole on the J-P dimension. Jungian Functional Theory cannot account for this interaction because sex differences are not part of the theory. If it were not for this sex interaction, there would have been no difference between the two poles and the hypothesis would not have been supported by the scores for the J-P dimension.

The results of the current study are similar in some respects to those reported by Lester and his co-workers. Feelers and introverts having higher scores for traditional beliefs than their polar opposites is contrary to the results of Lester et al. (1987). They reported that none of the four MBTI dimensions were correlated with scores on the traditional belief subscale of the original PBS. However, they did report that feelers, perceives and intuitives all tended to have higher scores on the other subscales of the PBS; with intuitives holding beliefs in the widest range of anomalous phenomena. Moreover, the current finding that feelers and perceives were more believing in anomalous phenomena than their polar opposites generally accords with other earlier reports. Lester and Murphy (1976) reported that feelers were more believing in ESP than thinkers and that this replicated their results from an earlier unpublished study. In that study

they found no correlation between belief in ESP and the E-I, S-N and J-P dimensions.

Some caution must be exercised when comparing the results of the current study with those of Lester and his co-workers because of the different assessment instruments that have been used. Lester and Murphy (1976) did not use either the PBS or the revised PBS, instead, they used a self-made and unvalidated ESP belief scale. Their scale contained only three items, tapping telepathy, clairvoyance and precognition; and the response scale had only three choices, "yes", "maybe" and "no". Of these three phenomena, only two, telepathy and precognition, were common to the revised PBS. Additionally, in the second of their studies they used only part of the MBTI inventory, namely the items comprising the T-F dimension. Since the MBTI was designed to have the items relating to any one dimension interleaved with all other items, this selective use of only the thinking and feeling items of the MBTI may well have resulted in an incorrect assignment of subjects to the thinking and feeling poles. So, although the inclusion of clairvoyance extends the generality of their results, the exclusion of the remaining anomalous subscales together with the other three MBTI dimensions in their second study, makes it difficult to make detailed comparisons. Lester et al. (1987) used the original PBS which allows comparisons with the current study to be more easily made. However, they used the Keirsey Temperament Sorter (KTS; Keirsey and Bates, 1984), rather than the MBTI, to assess the personality dimensions. The KTS is an

unvalidated instrument which, while having a considerable resemblance to the MBTI, may not produce the same assignments to the poles of the various Jungian dimensions.

Despite these caveats, certain consistencies can be seen in the results from the current study and those of Lester and his co-workers. In four studies the T-F dimension was correlated with belief in the anomalous, feelers having higher scores than thinkers. Feelers also had the higher scores for traditional beliefs on one occasion.

The T-F dimension has consistently been found to be correlated with religious or anomalous beliefs. This is because the T-F dimension in Functional theory is a decision making dimension. It determines whether an individual makes decisions using logical and objective thinking, or using personal and subjective evaluation. Feelers prefer to make decisions by considering their wish to affiliate with others and their need for harmony. Hence, feelers tend to succumb more easily to the influence of their own personal experiences and those of others. Thinkers, on the other hand, prefer to make decisions by weighing facts and consequences objectively. They tend to place impartiality, a sense of fairness and justice above their own personal feelings. Since belief is a kind of personal decision and religious and anomalous beliefs are not amenable to logical analysis, feelers are more susceptible to such beliefs than thinkers.

Results for the other Jungian dimensions were inconsistent, the most reliable was the J-P dimension where the perceptives were more believing than judgers on two out of four occasions. Overall, when scores for involvement are included, feelers scored higher than thinkers on six out of seven times; perceptives scored higher than judgers on three out of six occasions; intuitives scored higher than sensors two out of six times and introverts differed on only one occasion from extraverts.

Overall, the hypotheses generated from Jungian Functional theory are supported on the T-F dimension. Also, they seem to be supported to a limited degree, by the differential scores on the traditional and anomalous subscales of the judging and perceiving poles. But this partial support must be qualified by noting that it was due to an unexpected interaction between the J-P dimension and the sex of the subjects. Otherwise, support on the J-P and the S-N dimension was weak. A possible reason for these inconsistent results is that the attitudes and functions were considered to be acting in isolation from one another. Functional theory emphasizes the dynamic interaction of the individual functions and attitudes to produce characteristic behaviour.

Keirsey and Bates' four temperaments

Keirsey and Bates (1984) proposed a four-temperament theory of personality where each temperament has its own unique

characteristics that are not shared with other temperaments. They claimed that the 16 Jungian types of the MBTI fell naturally into four groups, and that each of these four groups typifies one of the four temperaments. Keirsey and Bates' descriptions of the four temperaments were used to generate hypotheses regarding the rank ordering of mean scores for the temperaments on the paranormal belief and involvement subscales. Using the MBTI scheme, the SP, SJ, NT, and NF groups were used to identify the four temperaments Dionysian, Epimethean, Promethean and Apollonian respectively.

Traditional beliefs

The description of the Apollonian temperament, indicated that their mystical and spiritual natures should incline them to hold beliefs in traditional spiritual phenomena comparable to that of the Epimethean temperament. The Epimethean being conservative in their belief and guardians of the traditions providing the social norms. It was also expected that the Apollonians and the Epimetheans would be stronger believers in traditional beliefs than the Prometheans who are by nature sceptical and reluctant to blindly accept orthodox beliefs. The results were as expected: the Apollonians and Epimetheans were comparable in the degree of their traditional beliefs and markedly more so than the Prometheans.

Traditional involvement

Although involvement with the traditional beliefs does not necessarily correlate with holding those beliefs, it was expected that the mystical Apollonians would be as involved as the traditional Epimetheans who tend to maintain the status quo in social activities, worship or rituals relating to such traditional beliefs. And, it was also expected that the Prometheans would be less involved than either the Apollonians or the Epimetheans because they are natural sceptics who would query the truth of such beliefs and therefore tend to decline to be involved with them. This again proved to be the case. The Apollonians were as equally involved as the Epimetheans in traditional beliefs and the Prometheans were less involved than either.

Anomalous belief

The spiritual nature of the Apollonians that makes them accept the traditional beliefs was also expected to lead them to seek alternative spiritual paths. The result of this would be to make them accept and believe in anomalous phenomena to a greater degree than either the sceptical Prometheans, and also the conservative Epimetheans who would reject such beliefs as being "not the done thing". The Epimetheans and Prometheans were expected to hold similar degrees of belief. As expected, the Apollonians were found to be stronger believers in the anomalous than either the Prometheans or Epimetheans who were equally (dis)believing.

Anomalous involvement

With traditional involvement, it was expected that the relative belief of the groups would be reflected in their relative involvement with those beliefs. This pattern was expected to be repeated with anomalous involvement for two of the three groups. It was expected that the Apollonians, with their spiritual nature, would be more involved than the traditionalist Epimetheans who would be suspicious and disbelieving of the anomalous. However, the sceptical Prometheans, with their need to know and to investigate, would be more involved than the traditional Epimetheans. Thus the Prometheans and Apollonians would be similarly involved in the anomalous and to a greater extent than the Epimetheans and this was indeed found to be the case.

In summary, it is clear that with all hypotheses supported, the variables that were chosen differentiated between all three groups. On the traditional belief and involvement subscales the Prometheans were clearly different to the other two groups, the Apollonians and the Epimetheans. However, on the anomalous belief subscale the Apollonians were different from the others while on the anomalous involvement subscale it was the Epimetheans who were clearly different.

In the Introduction, clear distinctions were made between, firstly, the two concepts of traditional and anomalous phenomena, and secondly, between belief and involvement with paranormal phenomena. It is now appropriate to assess the

effect of making these distinctions on the outcome of the current study.

Without the distinction having been made between traditional and anomalous phenomena, only one sensible hypothesis could have been made regarding beliefs and temperaments; namely, that Apollonians would have had higher belief scores than Prometheans. The change in the relative standing of the Epimethean's scores between traditional and religious beliefs would have been obscured by collapsing the two belief subscales into one scale. Similarly, without the distinction between traditional and anomalous phenomena, the only sensible hypothesis regarding involvement would have been that Apollonians would have higher scores than either Prometheans or Epimetheans. This would have come about because the change in the relative standing of the Prometheans would have been obscured by the collapsing of the scales. One additional point that has already been noted is that the distinction has enabled an interaction between sex and one of the Jungian functions to be detected. Had the distinction not been made, it is unlikely that this interaction would have been recognized.

We can now turn to the distinction that was made between belief and involvement. As a consequence of separating belief from involvement, the results of the study allows one to discount Irwin's (1993) suggestion that the relationship between belief and involvement is so predictable as to be uninteresting. This was clearly demonstrated by the fact that the while the

Prometheans had the lowest scores for anomalous belief, their scores for anomalous involvement were almost as high as those of the Apollonians. Also, his comment that belief and involvement are mutually reinforcing is further shown to be not entirely correct. In the introduction it was noted that McGarry and Newberry (1981) had identified two groups of paranormal believers, the high believers-high involvers and the high believers-low involvers. The Prometheans, on the other hand, appear to correspond to one of the two groups complementary to those found by McGarry and Newberry, namely the low believers-high involvers. However, this interesting relationship is found only for anomalous phenomena. Hence, this is further evidence to justify the need to distinguish between traditional and anomalous phenomena. An additional point made earlier, is that the conclusion that the Sex x J-P interaction was a real effect rather than a spurious one was made on the grounds that it was found for both paranormal belief and paranormal involvement.

**Temperaments and Functional theory:
evaluation and relationship**

The current study investigated the personality correlates of believers and involvers in both traditional and anomalous phenomena. Two approaches to personality were adopted, one was Jungian Functional theory and the other a contemporary version of Temperament theory (Keirsey & Bates, 1984). The outcome of the study is unambiguous. All of the hypotheses derived from

Temperament theory were supported whereas only limited support was found for those derived from Functional theory. Even when the fact that these results replicated those from previous studies the support for Functional theory remains limited. However, the apparent ease with which finer distinctions can be made between groups when using Temperament theory needs to be further explored. This is because it is by no means clear that Functional theory and Temperament theory are unrelated.

That the two theories may be related can be seen by the fact that Keirsey and Bates (1984) rely upon the MBTI (or its derivative the KTS) to classify people into the four temperaments. Grouping the types into temperaments implies a correspondence between Jungian Functional theory and Keirsey and Bates' Temperament theory. This suggests that temperaments can be regarded as one of several possible groupings of the MBTI types. If the temperaments are natural associations of MBTI types then the behaviours associated with the temperaments should be deducible from Functional theory. In which case, since the temperaments are identified by pairing two poles from two of three dimensions, the description of the temperaments should be comparable to the descriptions of the interaction within each pairing. For example, combining the individual characteristics of the intuitive pole with those of the thinking pole should produce the characteristics of the intuitive-thinker (NT) type groups. Since Keirsey and Bates (1984) equate the NT grouping to the Promethean temperament, the description of the intuitive thinker should match the

Promethean temperament portrait. The next few paragraphs demonstrate that the descriptions of the type groups do indeed match the equivalent temperament portraits.

Prometheans, identified as the NT group by Keirsey and Bates (1984), prefer to use mainly the intuitive function to gather information, instead of depending on the sensing function to gather facts by the five senses. With predominantly intuitive insight augmented by some sensory input, they have a wide range of options to form the basis of decision making. To make decisions, they prefer to use the thinking function instead of the feeling function; thereby seeking to analyze the collected data in a logical and objective manner. In this way they are able to put their subjective evaluations aside, and stand back from emotions to evaluate objectively the information that they acquire. Information acquired intuitively comes holistically, as hunches, insightful relationships, meanings, patterns among apparently unrelated events, creative ideas and future possibilities. The NT's decision process, then, depends on the principle of cause and effect, impersonal analysis, logical thinking, objective evaluation, and a time frame that spans from past through the present to the future. The logical argumentation that underlies the thinking function always falls short of fully comprehending that which intuition provides. Hence, the intuitive-thinker will never be able to dissect fully the given information to arrive at complete understanding or certainty of the situation. Furthermore, because the intuitive function continues to provide information, the

thinking function never ceases to pursue a solution. This makes the NT pairing into an open system that does not close. This is because the intuitive function continues to provide insight and possibilities, thereby compelling the thinking function to continue to explore and investigate. The thinking function is compelled by its own nature to try to comprehend a never ending kind of information that is too holistic or too broad, for logical comprehension. For example, one cannot finalize an argument on future possibilities until those possibilities become reality. This then is the source of the NT's need to know and to continue to investigate. This is why the NTs can be involved with anomalous phenomena without believing in the reality of them; there are always doubts about the finality of the outcome of an investigation. But, an investigation must be feasible, and this is why the NTs tend to be uninvolved with traditional beliefs. Reincarnation, miracles, God, Heaven and Hell are not amenable to investigation, whereas psi, UFOs and similar anomalous phenomena can be investigated.

The Apollonian, identified as NFs by Keirsey, also uses the intuitive function to collect information. Like the NTs, their information comes holistically and includes hunches, relationships through insight, meanings, patterns in apparently unrelated events, creative ideas. However, for decision making, the NFs prefer the feeling function rather than the thinking function, evaluating the incoming information in a subjective and personal manner. Their decision making depends

on principles of values and on the merits of the issues involved. They understand personal and group values, having a sense of affiliation and seeking to empathize and harmonize with others. They have an enduring sense of values that spans from past through the present to the future. Because the subjective values that underlie the feeling function always encompass the emotions, decision making is more to do with accepting or rejecting the information in its entirety than with understanding it. Because acceptance of an issue implies certainty that the choice is correct, the NF combination forms a closed system. This comes about because decisions, being value based, are accompanied by an emotional commitment which tends to make the decision irreversible. New information must therefore be incorporated into an existing personal experiential framework, which must expand to accommodate it. This may be exaggerated by the emotional commitment which, even by itself, can generate an enthusiasm for extending the decision framework. In its turn this can lead to selective interpretation or rejection of disconfirming information. This is especially so when intuition, which is essentially a private and personal understanding, is naturally unready to incorporate contrary information. Furthermore, the emotional concomitant of a decision can interact with the extensive time frame within which NFs operate. This means that NFs may fail to distinguish between what ought to be, what might be, and what most probably will be. Failing to distinguish between oughts and wills, allied to selective interpretations and enthusiasms makes the NF a particularly gullible individual. These characteristics

means that the NF responds enthusiastically to both the *spiritual* content of traditional belief and the desirability of many anomalous phenomena. This is made even easier by the fact that there is a considerable content overlap between the two areas, such as reincarnation and miracles (Tobacyk & Milford, 1983).

Epimetheans, identified as the SJ group by Keirsey, prefer to use mainly the sensing function to gather information, depending but little on the intuition function to receive insight from the unconscious. With predominantly factual input, they live in concrete reality, preferring to attend to the here-and-now. External information obtained through the senses is bound by space and time, arriving sequentially (piece meal). Also, because the information has an external source, it can be more readily verified. The judging pole, in its turn, confers a natural tendency to seek closure, that is, to make an immediate and final decision. This means that there is unwillingness to continue to accept further information, and yet information continues to arrive and not all of it can be excluded from the system. The result of this is that information is selectively acquired, that which fits the existing perceptual framework is accepted, that which doesn't fit is rejected. With the SJs compelled to prevent new information being accepted they therefore have to act on an incomplete data base. With only partial information available to them, the SJs cannot make long conceptual steps and so are slow to change their minds or attitudes. The SJ therefore

tends to form a closed information system, reinforcing previous experience rather than extending it. Consequently, SJs are traditionalists who change only slowly in a step-by-step fashion. Hence, the SJ would be expected to accept and be involved with the traditional beliefs and values that were acquired at an early age, but reject a belief in anomalous phenomena.

Dionysians, identified as the SPs by Keirse and Bates (1984), also prefer to use mainly the sensing pole of the S-N dimension to gather information with little input from intuitive insight. A predominantly factual input gives a world of concrete reality in which information acquired by the senses comes sequentially, bound by space and time. Consequently, the present moment tends to be the focus of attention, giving rise to a here-and-now realism. Along with a sensing preference, the SP also prefers the perceptive pole of the J-P dimension. This confers a natural tendency to stay attuned to the incoming sensory information without impeding its continuous flow. The SPs therefore actively seek sensory input without ever coming to firm decisions about it. In short, they form an open system. As a consequence they are spontaneous, stimulus seeking and act quickly as situations change. At the same time, long term commitments and planning are alien to them. The SPs are thus flexible, which allows them to experience life to the full, but this also makes them variable and unpredictable in their behaviour. Hence belief and involvement with either traditional or anomalous phenomena will be capricious.

From the foregoing discussion, it can be seen that when the interaction of certain appropriate functions/attitudes are taken into consideration, the characteristics described from Functional theory are very similar to the temperament portraits given in the Introduction.

The similarity between the temperament descriptions given by Keirsey and Bates (1984) and those generated from functional theory suggests that the four temperaments may be a naturally occurring grouping of the MBTI types rather than an artificial grouping. Keirsey and Bates give very little indication of how they derived their temperaments, determined the behaviour of the temperaments and justified their being equated with particular MBTI groups. Later, Keirsey (1987) wrote that the temperaments were derived from Kretchmer's schizoids and cycloids, equating with the schizoids to the NTs and NFs, and the cycloids to the SPs and SJs. These are not an obvious choice of groups compared to the groups chosen by Myers and McCaulley (1985). These authors formed all of the NF, SF, NT and ST groups by combining a judgement function (T-F) with a perceptive function (S-N); the groups are formed by all possible pairings of the poles of the two dimensions. In contrast, only two of the groups used by Keirsey and Bates, the NTs and NFs, are formed by combining two functions. The other two groups, the SPs and the SJs, are formed by combining the sensing function with the J-P attitude. Only further research can demonstrate whether or not the temperaments form a set of self consistent groups compared to other possible groups.

At the same time, given the ease with which Functional theory generated equivalent descriptions, it is hard to accept that the temperaments constitute monolithic personality entities as claimed by Keirsey and Bates (1984). If all four temperament portraits can be generated by combining the Jungian dimensions then Keirsey and Bates' version of temperament theory may not be an independent theory at all. Instead it may be an inspired recognition of an equivalence between four naturally occurring groups and four subsets of Jungian types. If this is the case, then it may be possible to use their insight to extend Jung's Functional theory in new directions.

Regardless of whether or not the temperaments are a naturally occurring grouping of the MBTI types, the manner by which the groups are constituted allows their explanatory power to go beyond what has been demonstrated here. Irwin (1993) has offered a model that relates the fantasy prone personality to anomalous beliefs. In the model, paranormal beliefs serve as a coping mechanism in which the beliefs confer a form of illusory control over an otherwise uncontrollable world. Irwin assumes that fantasy proneness is a personality characteristic and accordingly makes no attempt to identify the personality correlates of fantasy proneness. In adopting the implicit theory of the fantasy prone personality, Irwin discounts the possibility that fantasizing has more fundamental determinants. However, from a Temperament or Functional theory framework, some groups are more likely to fantasize than others.

In Functional theory and Keirsey and Bates' (1984) Temperament theory, intuition is the source of creativity and inspiration. Fantasy is one of the simpler forms of intuition. Accordingly, the NT and NF groups would be expected to be over represented among the fantasizers compared to the SP and SJ groups.

Furthermore, this identification of the fantasy prone group with the intuitives can be refined further. Faced with an unpleasant situation, the NTs use creative thinking to do something about it in an objective way, rather than only attempting to fantasize it away. The NFs, on the other hand, tend not use the logical processes to deal with the situation in this manner. Instead they use imagination to create a more pleasant interpretation of the situation. Thus, they act according to their subjectively evaluative preferences.

Expressed somewhat differently, the NFs attempt to control the situation subjectively, whereas the NTs attempt to control the situation objectively.

This illustration of the possible origins of fantasy proneness serves to demonstrate the value of using a fully descriptive personality theory. Also, since it has been shown that Keirsey and Bates' (1984) temperament portraits can be generated from Functional theory, the illustration supports the idea that the temperaments are a natural grouping of the MBTI types. If further research shows that this is indeed the case, can Functional theory explain why it should be so?

Furthermore, can functional theory be extended to incorporate sexual differences in behaviour? Sex differences are the final topics to be considered.

Sex differences in paranormal beliefs and involvement

The four dependent variables

In this study females had higher scores than males on all of the main measures, although only on traditional and anomalous beliefs were they significantly higher. This result extends further the list of studies reporting that females have higher paranormal belief scores than males (Clarke, 1991, 1993; Haraldsson, 1981, 1985; McGarry & Newberry, 1981; Messer & Griggs, 1989).

The Jungian dimensions and the temperaments

There were no interactions between sex and the four temperaments. Similarly, there were no interactions between sex and three of the Jungian dimensions. The exception was the Sex x J-P interaction. This interaction occurred for both anomalous belief and anomalous involvement and was due solely to judging males having disproportionately lower scores than perceptive males or either judging or perceptive females. This interaction was unexpected and cannot be explained by Functional theory, because sex has never been considered in relation to the Jungian functions. Also, as already noted, the judging and perceptive groups were expected to differ differentially between the traditional and anomalous subscales.

That is, judges were expected to have the higher scores on the two traditional subscales while percptives were expected to have the higher scores on the anomalous subscales. However, other than the scores for the male judges on the anomalous subsacles, there were no differences between the judging and perceptive groups. So, had it not been for this sex interaction the hypotheses would not have been supported. The fact that the interaction occurred for both belief and involvement indicates that it is more likely to be due to a real difference between the sexes than a spurious result.

Individual anomalous phenomena

Some qualifications must be noted regarding the generally higher belief scores for females. Although females generally had overall higher belief scores than males, when the individual anomalous phenomena were examined, there were two exceptions to this pattern. Males and females did not differ in their belief scores for superstition. Also, males had higher scores than females for belief in extraordinary life forms. Higher scores by males for belief in extraordinary life forms has been reported by others (Clarke, 1991; Messer & Griggs, 1989). However there is nothing in Jungian theory or temperament theory to indicate why this should be so and any suggestions could only be speculative. Perhaps males as a whole, whether genetically or culturally, are more prone to seek adventure or are more affected by ideas from science fiction.

The results of other studies have also revealed a sex difference for belief in the individual anomalous phenomena. Females have been found to hold stronger beliefs in psi, spiritualism and precognition by Clarke (1991), Gray (1984), Haraldsson (1981, 1985), Messer and Griggs (1989) and also by Tobacyk and Milford (1983).

Additionally, the higher belief scores for females were often, but not always, reflected in the corresponding involvement scores. For instance, while males and females had the same mean scores for superstition, females were more likely to follow superstitious practices. Unfortunately there is little in the literature to provide reasons for the difference. Superstitious practices are irrational and subjective and therefore more likely to be maintained by feelers. Cultural stereotyping encourages males to function as thinkers but females are encouraged to function as feelers who base decisions on subjective values of self and others. Consequently, forms of social compliance make it more likely that the practices will be passed from mothers to daughters. However, this argument is contradicted by the fact that by about 1975, only 40% of American male samples were classified as thinkers (Myers & McCaulley, 1985). At the same time social compliance may be acting on the males; superstition is not compatible with maleness and social pressure is put onto males to refrain from such practices.

A possible alternative explanation for females being more likely to follow superstitious practices is maternal protectiveness allied to the ease with which many superstitious practices can be carried out. It takes little effort to "Touch wood" and even if it has no effect "It's better to be safe than sorry".

There were other examples of discrepancies between belief and involvement for the two sexes. Females had higher belief scores for psi and witchcraft, but their involvement scores were no different to those of the males.

Future research and conclusions

There is a clear pattern to the component functions of Keirsey and Bates' (1984) temperaments in that an entire group of types can be characterized by just one pair of jungian dimensional poles. Furthermore, the results of the current study indicate that these groups may be natural categories rather than arbitrary ones. Research is needed to establish whether or not these, or any other MBTI groupings, form natural categories. An extensive development of Functional theory to include the interaction of the various poles and dimensions is required. Myers and McCaulley (1985) maintain that it is the dynamic interplay of the functions and attitudes that determine the personality of an individual. But other than establishing the rules for determining the preferential ordering and exposure of the functions, the interaction of the functions has never been

fully elucidated. When this has been done it may well be found possible to derive some principles of Functional theory showing that the types form natural categories corresponding to Temperaments.

The results of the current study and the subsequent theoretical analysis clearly demonstrated the advantages that accrue from adopting a fully descriptive personality theory from the outset of the investigation. By doing so, the explanatory power of the theory could be employed when interpreting the results. This, in its turn, highlighted the shortcomings of allowing the choice of personality characteristics to be governed by subjective notions of what constitutes personality. The illustrative example that was chosen, the fantasy prone personality, could well be the topic of future work.

The Sex x J-P interaction for anomalous belief and involvement warrants further investigation. This would have to be preceded by further theoretical development since, at present, Functional theory cannot account for these (or any) sex differences. It is clear that sex modifications of Jungian dimensions, which has not, so far, been addressed in the literature, is a potentially fruitful area for research.

Further development of the Paranormal Involvement Scale is needed, especially by having an equal number of items for each phenomenon. The perceived differences between traditional and anomalous phenomena could also be investigated while a file of

MBTI based demographic data for New Zealand may be a useful research resource.

Overall, the essential results of Lester (Murphy & Lester, 1976; Lester et al., 1987) were replicated and it proved possible to account for the inconsistent results that had been reported. Initially, this was accomplished by using Keirsey and Bates' (1984) temperament descriptions to generate supported hypotheses about specific combinations of the MBTI types. Then functional theory was used to give an alternative account for the results of the study. Using Jung's Functional theory and Keirsey and Bates, (1984) Temperament theory, both of which focus on the normal functioning subjects, allowed the negative bias evident in previous research regarding paranormal beliefs to be avoided. Also, using well developed descriptive theories allowed the results to be interpreted fully, and different groups of believers and involvers to be identified. Making a clear distinction between traditional and anomalous phenomena, and also between belief and involvement allowed differential hypotheses to be generated between groups and subscales. In this way, it proved possible to demonstrate that for at least one group of subjects, the Prometheans, belief was not predictive of involvement. Also, as a consequence of having clearly separated belief and involvement on the one hand and traditional and anomalous phenomena on the other, an unexpected Sex x J-P dimension interaction was found. Perhaps the results of this study will encourage further development of Jung's theory of personality types.

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Appendix 1

Development of the Paranormal Involvement Scale

The Paranormal Involvement Scale used in the current study went through several versions before taking its final form. The first version consisted of two subscales, a traditional involvement subscale and an anomalous involvement subscale (Appendix 2). The traditional involvement subscale comprised nine items derived from Haraldsson (1981). Some of the items asked about religious activities while others asked about religious or spiritual experiences. Responses to some items were made using a three-point response scale, other items used a four-point scale. Examples of items for both response scales are:

Do you pray?

1. never. 2. seldom. 3. now and then. 4. often.

and:

Have you ever experienced divine guidance or consolation?

1. no. 2. yes, perhaps. 3. yes, definitely.

The anomalous involvement subscale consisted of 10 items tapping 10 anomalous phenomena. These were: psychokinesis, telepathy, witchcraft, superstition, astral projection, reincarnation, spiritualism and mediumistic communication, extraordinary life forms, astrology and precognition. Each anomalous phenomenon was described by a definition to ensure that all subjects understood the meaning of the phenomenon. The definitions of psychokinesis, telepathy, precognition,

spiritualism and mediumistic communication, extraordinary life forms, astrology and reincarnation were derived from Messer and Griggs (1989). Some of the definitions were modified from the original versions. Definitions of witchcraft, superstition and astral projection were generated from Mishlove (1975). There were 19 items altogether. The response items consisted of 5 statements, one of which the subject chose as best describing his or her involvement with the phenomenon. The statements were based on the four item response set of Messer and Griggs but with a fifth choice being added. Taking astrology as an example:

1. I have never heard of astrology before today.
2. I have heard of astrology but do not concern myself with it.
3. I personally know someone who believes in astrology and who reads astrological horoscopes for guidance in personal matters.
4. I myself believe in astrology and have often checked my horoscope for guidance in personal matters.
5. Both 3 and 4.

The fifth choice was added to extend the degree of involvement that could be assessed using the Paranormal Involvement Scale. The entire questionnaire included the MBTI and the revised PBS in addition to the Paranormal Involvement Scale. Seven subjects answered the questionnaire and the comments solicited from them were used to refine the scale thereby producing a second version of the Paranormal Involvement Scale.

The second version retained the two subscales, traditional and anomalous involvement. One new item, modelled on the

traditional religious items in the PBS, was added to the traditional involvement subscale. The item was:

"Traditional religious beliefs involve belief in God, the soul, the devil, heaven and hell."

This item was presented at the beginning of the questionnaire, the original nine traditional involvement items having been moved to the end of the questionnaire. This was done to make the subscale distinct from the new item. Changes were made also to the anomalous involvement subscale. The original items for superstition (Item 13) and witchcraft (Item 12) were replaced by two different items. This was done to make the items more akin to the corresponding items in the revised-PBS. One of the other two new items related to extraterrestrial visitation and the other to biorhythms (Appendix 3) The questionnaire now had 23 items, 14 of which were in the form of definitions.

For the nine items taken from Haraldsson (1981), the original three or four response options were retained. For the remaining items, including the new traditional involvement item, the response alternatives were increased from five to eight options giving a wider range of choices. This was expected to make the response scale more acceptable to subjects by making it easier for them to discriminate among differing degrees of involvement. For example, one person may only read the star column of the newspaper whereas another might utilize

crystal balls to predict the future. A eight-point scale would more easily accommodate such a range of involvement.

Nine subjects completed this new version together with the MBTI and revised PBS, and again comments were solicited from them. All complained about the length of the entire questionnaire. They considered that the 9 items for traditional beliefs (Haraldsson, 1981) were redundant and that the single item matching the traditional beliefs of the PBS was adequate. Furthermore, some of the nine questions confused traditional religious phenomena with anomalous experiences or phenomena. For instance: "Have you ever had a vivid religious or spiritual experience?", or "Have you ever read articles or books on Eastern religions or theosophy?". For these reasons, the next version of the Paranormal Involvement Scale was reduced in length.

The Paranormal Involvement Scale was shortened in preference to the MBTI and the PBS for two reasons. Firstly, neither the MBTI nor the PBS could be shortened without impairing their reliability. Secondly, all seven of the paranormal constructs contained in the PBS had to be included in the Paranormal Involvement Scale to provide an analogous scale for comparison.

The third version was reduced from 23 to 14 items by discarding the nine religious involvement items derived from Haraldsson (1981). Two alterations to the remaining items were made. The item relating to bad luck was replaced by a more concrete

example. The item relating to black magic and occult practices was discarded because it was superfluous since witchcraft covered those phenomena. Finally, a new item concerned with Tarot cards was included (Appendix 4).

Culling the items relating to traditional involvement in preference to culling those relating to anomalous involvement was also done for a number of reasons. In part it was done to shorten the time taken for the entire study. At the same time the items derived from Haraldsson (1981) confounded a number of concepts. For instance, spiritual experience may not entail spiritual or religious involvement. Furthermore, the concepts of God, the soul, the devil, and heaven and hell are so closely linked in popular religion that it was deemed inappropriate to separate them. It was decided that a single item could be formulated to include the four traditional concepts covered in the PBS. These are: God, the soul, the devil, and heaven and hell. The item finally used was, "Traditional religious beliefs involve belief in God, the soul, the devil, heaven and hell."

For this version of the Paranormal Involvement Scale, the response options were reduced from eight to five choices. This was done because the subjects complained that they found the response scale was too wide. Furthermore, it was decided that an odd number of response scale categories was preferable because it would provide a central neutral category.

Six subjects answered the third version of the questionnaire and their comments were noted. This led to the production of a fourth version in which the items of the third version were unaltered but the response options were expanded from five to eight. This was done so that a direct comparison could be made between the five and eight point response scales using the same set of items.

Five subjects answered the fourth questionnaire and their comments were again noted. It was then decided that a seven-point response scale would provide a sufficiently wide range of options while giving a central neutral category. Also a seven-point response scale would match the response scale of the revised-PBS. Thus options 4 and 5 were collapsed into one (Appendix 5).

The final version of the Paranormal Involvement Scale used 14 definitions of paranormal phenomena. It had two subscales: traditional involvement and anomalous involvement. The traditional involvement subscale consisted of only one item, but the anomalous involvement subscale contained 13 items.

The correspondence between the Paranormal Involvement Scale items and those of the revised PBS were as follows:

Item 1 (Traditional religious beliefs) in the Paranormal Involvement Scale was matched to items 1 (soul), 8 (devil), 15

(God) and 22 (heaven and hell) in the traditional beliefs subscale of the revised-PBS.

Item 2 (psychokinesis) and item 3 (telepathy) in the Paranormal Involvement Scale matched items 2, 9, 16 (psychokinesis) and item 23 (mind reading) in the psi subscale of the revised-PBS.

Item 4 (witchcraft) in the Paranormal Involvement Scale matched items 3 (black magic), 10 (witches), 17 (spells), 24 (witchcraft) in the witchcraft subscale of the revised-PBS.

Item 5 (luck) in the Paranormal Involvement Scale matched items 4 (black cat and bad luck), 11 (broken mirror and bad luck), 18 (unlucky 13) in the superstition subscale of the revised PBS.

Item 6 (astral projection), 7 (reincarnation), 8 (spiritualism and mediumistic communication) in the Paranormal Involvement Scale matched items 5 and 12 (astral projection), 19 (reincarnation), 25 (communication with the dead) in the spiritualism subscale of the revised PBS.

Items 9 (extraordinary life forms), 10 (extraterrestrial visitation) in the Paranormal Involvement Scale corresponded to items 6 (abominable snowman of Tibet), 13 (Loch Ness monster), 20 (life on other planets) in the extra-ordinary life forms of the revised PBS.

Items 11 (astrology), 12 (precognition), 13 (Tarot cards), 14 (biorhythms) in the Paranormal Involvement Scale matched items 7 (astrology), 14 (horoscope), 21 (prediction), 26 (prediction) in the precognition subscale of the revised PBS.

Definitions were provided for the 14 phenomena of the Paranormal Involvement Scale. Each definition was accompanied by a set of seven statements indicating differing degrees of involvement with that phenomenon. These statements effectively formed a seven-point response scale. Subjects chose the statement that best fitted their experience with the phenomenon and recorded their choice on the same sheet that was used for responding to the revised PBS (Appendix 6).

Appendix 2

Paranormal Involvement Scale: first version

For the first 9 items select the answer which best describes your involvement in religious matters. Write the number beside your choice in the appropriate box on your Answer Sheet. There are no right or wrong answers.

1. Do you read articles or books about religious matters?
1. never 2. seldom 3. now and then 4. often
2. How religious do you consider yourself to be?
1. not at all 2. slightly 3. fairly 4. very
3. Do you pray?
1. never 2. seldom 3. now and then 4. often
4. Do you attend religious gatherings?
1. never 2. seldom 3. now and then 4. often
5. Have you ever felt in some way the presence of God or a higher power?
1. no 2. yes, perhaps 3. yes, definitely
6. Have you ever experienced divine guidance or consolation?
1. no 2. yes, perhaps 3. yes, definitely
7. Have you ever had a vivid religious or spiritual experience?
1. no 2. not sure 3. ye s
8. How often do you read the Bible?
1. never 2. seldom 3. now and then 4. often
9. How often do you read articles or books on Eastern religions or theosophy?
1. never 2. seldom 3. now and then 4. often

For items 10 to 19, select the statement which best describes your involvement in an area. First, the area is described, then there are five (5) statements. Write the number beside the statement in the appropriate box on your Answer Sheet. There are no right or wrong answers.

10. Psychokinesis is the production of movement in inanimate objects by the use of psychic powers.
 1. I have never heard of psychokinesis before today.
 2. I have heard of psychokinesis but have never experienced it myself.
 3. I personally know someone who claims to have experienced psychokinesis.
 4. I myself have experienced psychokinesis.
 5. Both 3 and 4.
11. Telepathy is the direct communication of thoughts from mind to mind without the use of normal senses.
 1. I have never heard of telepathy before today.
 2. I have heard of telepathy but have never experienced it myself.
 3. I personally know someone who claims to have experienced telepathy.
 4. I myself have experienced telepathy.
 5. Both 3 and 4.

12. Witchcraft involves the use of black magic and sorcery.
 1. I have never heard of witchcraft before today.
 2. I have heard of witchcraft but do not concern myself with it.
 3. I personally know someone who claims to practice witchcraft.
 4. I myself have practiced some witchcraft.
 5. Both 3 and 4.

13. Superstition is based upon the assumptions of cause and effect contrary to known scientific facts and principles.
 1. I have never heard of superstition before today.
 2. I have heard of superstitious practices but do not concern myself with them.
 3. I personally know someone who claims to be superstitious.
 4. I myself have some superstitious practices.
 5. Both 3 and 4.

14. Astral projection is the separation of the consciousness of a person from the physical body during a trance or meditative state or during states of sleep, allowing the disembodied consciousness of the person to pass through walls, see events occurring at a distance from the physical body of the meditating or sleeping person, or even to pass into outer space before returning.
 1. I have never heard of astral projection before today.
 2. I have heard of astral projection but have never experienced it.
 3. I personally know someone who claims to have experienced astral projection.
 4. I myself have experienced astral projection.
 5. Both 3 and 4.

15. Reincarnation is the concept that after death, whether immediately or at some point later, the soul or spirit of the person who died is born again into a new body.
 1. I have never heard of reincarnation before today.
 2. I have heard of reincarnation, but do not believe that I have ever lived in another body.
 3. I personally know someone who claims to have been reincarnated.
 4. I myself have had experiences or thoughts which have led me to believe that I have had a prior life in another body.
 5. Both 3 and 4.

16. Spiritualism and mediumistic communication involve the concept that the dead communicate with the living, usually through a medium, who is a person thought to have such powers as are necessary to communicate with the spirits of the dead.
 1. I have never heard of spiritualism and mediumistic communication before today.
 2. I know what spritualism and mediumistic communication are but do not concern myself with them.
 3. I personally know someone who claims to have communicated with the spirit of someone dead, or has been present at a seance where a medium supposedly communicated with the spirits of the dead.
 4. I myself have been contacted by the spirit of someone dead, or have attended a seance where a medium supposedly communicated with the spirits of the dead.
 5. Both 3 and 4.

17. Extraordinary life forms are creatures or beings which have manifested themselves in physical form, such as the Loch Ness monster or spacecraft and beings from other planets (extraterrestrial beings).
1. I have never heard of extraordinary life forms before today.
 2. I have heard of extraordinary life forms but do not concern myself with them.
 3. I personally know someone who claims to have seen an extraordinary life form or been contacted by extraterrestrial beings.
 4. I myself have seen an extraordinary life form or been contacted by extraterrestrial beings.
 5. Both 3 and 4.
18. Astrology is the concept that the positions and motions of the planets at the time of a person's birth influence that person's personality and from which the times of important events in that person's life can be predicted.
1. I have never heard of astrology before today.
 2. I know what astrology is but do not concern myself with it.
 3. I personally know someone who believes in astrology and who reads astrological horoscopes for guidance in personal matters.
 4. I myself believe in astrology and have often checked my horoscope for guidance in personal matters.
 5. Both 3 and 4.
19. Precognition is the knowledge of some event in advance of its occurrence by some persons who have an unexplained ability to predict the future or which is manifested in some unknown way during the dream states of sleep.
1. I have never heard of precognition before today.
 2. I have heard of precognition but have never experienced it.
 3. I personally know someone who claims to have foreseen an event and later that event actually occurred.
 4. I myself have foreseen an event and later that event actually occurred.
 5. Both 3 and 4.

PLEASE CONTINUE ON NEXT PAGE ...

Appendix 3

Paranormal Involvement Scale: second version

PLEASE MAKE NO MARKS ON THESE PAGES

WRITE THE NUMBER OF YOUR CHOICE ON THE SEPARATE ANSWER SHEET

For items 1 to 22, please put in the appropriate box on your Answer Sheet the number which best describes your degree of involvement in each area. There are no right or wrong answers. This is a sample of your own degree of involvement. Please read all the choices for each item carefully before you make your choice, and try to select a number for each item.

1. Traditional religious beliefs involve belief in God, the soul, the devil, heaven and hell.
 1. I have never heard of traditional religious beliefs.
 2. I know what religious beliefs are but do not concern myself with them.
 3. I personally know someone who follows traditional religious beliefs.
 4. I occasionally read books or articles on traditional religious beliefs.
 5. I myself follow traditional religious beliefs.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4, and 5.

2. Psychokinesis is the production of movement in inanimate objects by the use of psychic powers or mental forces.
 1. I have never heard of psychokinesis.
 2. I know what psychokinesis is but do not concern myself with it.
 3. I personally know someone who claims to have experienced psychokinesis.
 4. I occasionally read books or articles on psychokinesis.
 5. I myself have experienced psychokinesis.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.

3. Telepathy is the direct communication of thoughts from mind to mind without the use of normal senses.
 1. I have never heard of telepathy.
 2. I know what telepathy is but do not concern myself with it.
 3. I personally know someone who claims to have experienced telepathy.
 4. I occasionally read books or articles on telepathy.
 5. I myself have experienced telepathy.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.

4. Witchcraft involves the use of magic and sorcery.
 1. I have never heard of witchcraft.
 2. I know what witchcraft is but do not concern myself with it.
 3. I personally know someone who claims to practice witchcraft.
 4. I occasionally read books or articles on witchcraft.
 5. I myself have participated in or practiced witchcraft.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.

5. Bad luck is based upon the assumptions of cause and effect contrary to known scientific facts and principles.
 1. I have never heard of bad luck.
 2. I know what bad luck is but do not concern myself with it.
 3. I personally know someone who claims to have experienced bad luck or who does things to avoid bad luck.
 4. I occasionally read books or articles on luck.
 5. I myself have experienced bad luck or do certain things to avoid bad luck.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.

6. Astral projection is the separation of the consciousness of a person from the physical body during a trance or meditative state or during states of sleep, allowing the disembodied consciousness of the person to pass through walls, see events occurring at a distance from the physical body of the meditating or sleeping person, or even to pass into outer space before returning.
 1. I have never heard of astral projection.
 2. I know what astral projection is but do not concern myself with it.
 3. I personally know someone who claims to have experienced astral projection.
 4. I occasionally read books or articles on astral projection.
 5. I myself have experienced astral projection.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.

7. Reincarnation is the concept that after death, whether immediately or at some point later, the soul or spirit of the person who died is born again into a new body.
 1. I have never heard of reincarnation.
 2. I know what reincarnation is but do not concern myself with it.
 3. I personally know someone who claims to have been reincarnated.
 4. I occasionally read books or articles on reincarnation.
 5. I myself have had experiences or thoughts which have led me to believe that I had a prior life in another body.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.

8. Spiritualism and mediumistic communication involve the concept that the dead communicate with the living, usually through a medium, who is a person thought to have such powers as are necessary to communicate with the spirits of the dead.
1. I have never heard of spiritualism and mediumistic communication.
 2. I know what spritualism and mediumistic communication are but do not concern myself with them.
 3. I personally know someone who claims to have communicated with the spirit of someone dead, or has been present at a seance where a medium supposedly communicated with the spirits of the dead.
 4. I occasionally read books or articles on spiritualism.
 5. I myself have been contacted by the spirit of someone dead, or have attended a seance where a medium supposedly communicated with the spirits of the dead.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.
9. Extraordinary life forms are creatures such as the Loch Ness monster or the abominable snowman of Tibet.
1. I have never heard of extraordinary life forms.
 2. I know what extraordinary life forms are but do not concern myself with them.
 3. I personally know someone who claims to have seen an extraordinary life form.
 4. I occasionally read books or articles on extraordinary life forms.
 5. I myself have seen an extraordinary life form.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.
10. Extraterrestrial visitation is concerned with spacecraft and beings from other planets who have visited the earth.
1. I have never heard of extraterrestrial visitation.
 2. I know what extraterrestrial visitation is but do not concern myself with it.
 3. I personally know someone who claims to have seen an extraterrestrial spacecraft or been contacted by extraterrestrial beings.
 4. I occasionally read books or articles on extraterrestrial visitations.
 5. I myself have seen an extraterrestrial spacecraft or been contacted by extraterrestrial beings.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3. 4 and 5.

11. Astrology is the concept that the positions and motions of the planets at the time of a person's birth influence that person's personality and from which the times of important events in that person's life can be predicted.
1. I have never heard of astrology.
 2. I know what astrology is but do not concern myself with it.
 3. I personally know someone who believes in astrology and who reads astrological horoscopes for guidance in personal matters.
 4. I occasionally read books or articles on astrology.
 5. I myself have often checked my horoscope for guidance in my life.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.
12. Precognition is the knowledge of some event in advance of its occurrence by some persons who have an unexplained ability to predict the future or which is manifested in some unknown way during the dream states of sleep.
1. I have never heard of precognition.
 2. I know what precognition is but do not concern myself with it.
 3. I personally know someone who claims to have foreseen an event and later that event actually occurred.
 4. I occasionally read books or articles on precognition.
 5. I myself have foreseen an event and later that event actually occurred.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.
13. Black magic and sorcery are occult practices which involve incantations and the casting of spells on persons or objects.
1. I have never heard of black magic and sorcery.
 2. I know what black magic and sorcery are but do not concern myself with them.
 3. I personally know someone who claims to practice black magic and sorcery.
 4. I occasionally read books or articles on black magic and sorcery.
 5. I myself have practiced black magic and sorcery, or have experienced spells cast on me by others.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.
14. Biorhythm theory holds that a 23-day physical cycle, a 28-day emotional cycle, and a 33-day intellectual cycle are set in motion at the moment of birth. According to the theory, a biorhythm chart can predict "up" days or "down" days, as well as critical days during which accidents are more likely to occur.
1. I have never heard of biorhythm theory.
 2. I know what biorhythms are but do not concern myself with it.
 3. I personally know someone who occasionally or regularly consults a biorhythm chart.
 4. I occasionally read books or articles on biorhythm theory.
 5. I am familiar with biorhythm theory and occasionally or regularly consult or construct a biorhythm chart.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.

15. Do you read articles or books about religious matters?
1. never 2. seldom 3. now and then 4. often
16. How religious do you consider yourself to be?
1. not at all 2. slightly 3. fairly 4. very
17. Do you pray?
1. never 2. seldom 3. now and then 4. often
18. Do you attend religious gatherings?
1. never 2. seldom 3. now and then 4. often
19. Have you ever felt in some way the presence of God or a higher power?
1. no 2. yes, perhaps 3. yes, definitely
20. Have you ever experienced divine guidance or consolation?
1. no 2. yes, perhaps 3. yes, definitely
21. Have you ever had a vivid religious or spiritual experience?
1. no 2. not sure 3. yes
22. How often do you read the Bible?
1. never 2. seldom 3. now and then 4. often
23. How often do you read articles or books on Eastern religions or theosophy?
1. never 2. seldom 3. now and then 4. often

Appendix 4

Paranormal Involvement Scale: third version

PLEASE MAKE NO MARKS ON THESE PAGES

WRITE THE NUMBER OF YOUR CHOICE ON THE SEPARATE ANSWER SHEET

For items 1 to 14, please put in the appropriate box on your Answer Sheet the number which best describes your degree of involvement in each area. There are no right or wrong answers. This is a sample of your own degree of involvement. Please read all the choices for each item carefully before you make your choice, and try to select a number for each item.

1. Traditional religious beliefs involve belief in God, the soul, the devil, heaven and hell.
 1. I have never heard of traditional religious beliefs.
 2. I know what religious beliefs are but do not concern myself with them.
 3. I occasionally read books or articles about traditional religious beliefs.
 4. I myself follow traditional religious beliefs.
 5. Both 3 and 4.

2. Psychokinesis is the production of movement in inanimate objects by the use of psychic powers or mental forces.
 1. I have never heard of psychokinesis.
 2. I know what psychokinesis is but do not concern myself with it.
 3. I occasionally read books or articles about psychokinesis.
 4. I myself have experienced psychokinesis.
 5. Both 3 and 4.

3. Telepathy is the direct communication of thoughts from mind to mind without the use of normal senses.
 1. I have never heard of telepathy.
 2. I know what telepathy is but do not concern myself with it.
 3. I occasionally read books or articles about telepathy.
 4. I myself have experienced telepathy.
 5. Both 3 and 4.

4. Witchcraft is an occult (hidden meaning) practice which involves the use of magic, sorcery and the casting of spells on persons or objects.
 1. I have never heard of witchcraft.
 2. I know what witchcraft is but do not concern myself with it.
 3. I occasionally read books or articles about witchcraft.
 4. I myself have participated in or practiced witchcraft.
 5. Both 3 and 4.

5. Some people avoid walking under ladders or are cautious in dealing with things associated with the number "13".
1. I have never heard of such behaviour.
 2. I know what this behaviour involves but do not concern myself with it.
 3. I occasionally show interest in articles or ads for lucky charms.
 4. I myself tend to avoid walking under ladders or am cautious in dealing with things associated with the number "13", and similar behaviour.
 5. Both 3 and 4.
6. Astral projection is the separation of the consciousness of a person from the physical body during a trance or meditative state or during states of sleep, allowing the disembodied consciousness of the person to pass through walls, see events occurring at a distance from the physical body of the meditating or sleeping person, or even to pass into outer space before returning.
1. I have never heard of astral projection.
 2. I know what astral projection is but do not concern myself with it.
 3. I occasionally read books or articles about astral projection.
 4. I myself have experienced astral projection.
 5. Both 3 and 4.
7. Reincarnation is the concept that after death, whether immediately or at some point later, the soul or spirit of the person who died is born again into a new body.
1. I have never heard of reincarnation.
 2. I know what reincarnation is but do not concern myself with it.
 3. I occasionally read books or articles about reincarnation.
 4. I myself have had experiences or thoughts which have led me to believe that I had a prior life in another body.
 5. Both 3 and 4.
8. Spiritualism and mediumistic communication involve the concept that the dead communicate with the living, usually through a medium, who is a person thought to have such powers as are necessary to communicate with the spirits of the dead.
1. I have never heard of spiritualism and mediumistic communication.
 2. I know what spritualism and mediumistic communication are but do not concern myself with them.
 3. I occasionally read books or articles about spiritualism.
 4. I myself have been contacted by the spirit of someone dead, or have attended a seance where a medium supposedly communicated with the spirits of the dead.
 5. Both 3 and 4.

9. Extraordinary life forms are creatures such as the Loch Ness monster or the abominable snowman of Tibet.
1. I have never heard of extraordinary life forms.
 2. I know what extraordinary life forms are but do not concern myself with them.
 3. I occasionally read books or articles about extraordinary life forms.
 4. I myself have seen an extraordinary life form.
 5. Both 3 and 4.
10. Extraterrestrial visitation is concerned with spacecraft and beings from other planets who have visited the earth.
1. I have never heard of extraterrestrial visitation.
 2. I know what extraterrestrial visitation is but do not concern myself with it.
 3. I occasionally read books or articles about extraterrestrial visitations.
 4. I myself have seen an extraterrestrial spacecraft or been contacted by extraterrestrial beings.
 5. Both 3 and 4.
11. Astrology is the concept that the positions and motions of the planets at the time of a person's birth influence that person's personality and from which the times of important events in that person's life can be predicted.
1. I have never heard of astrology.
 2. I know what astrology is but do not concern myself with it.
 3. I occasionally read books or articles about astrology.
 4. I myself have often checked my horoscope for guidance in my life.
 5. Both 3 and 4.
12. Precognition is the knowledge of some event in advance of its occurrence by some persons who have an unexplained ability to predict the future or which is manifested in some unknown way during the dream states of sleep.
1. I have never heard of precognition.
 2. I know what precognition is but do not concern myself with it.
 3. I occasionally read books or articles about precognition.
 4. I myself have foreseen an event and later that event actually occurred.
 5. Both 3 and 4.
13. Tarot cards are a deck of cards used in fortunetelling. On each card is a symbolic scene (for examples: The Fool, The Magician, The Hanged Man, Death). The cards are shuffled and spread to be "read" to reveal hidden influences in a person's life or to foretell future events in that person's life.
1. I have never heard of Tarot cards.
 2. I know what Tarots are but do not concern myself with them.
 3. I occasionally read books or articles about the Tarot.
 4. I myself have a Tarot deck and give readings to myself or others.
 5. Both 3 and 4.

14. Biorhythm theory holds that a 23-day physical cycle, a 28-day emotional cycle, and a 33-day intellectual cycle are set in motion at the moment of birth. According to the theory, a biorhythm chart can predict "up" days or "down" days, as well as critical days during which accidents are more likely to occur.
1. I have never heard of biorhythm theory.
 2. I know what biorhythms are but do not concern myself with them.
 3. I occasionally read books or articles about biorhythm theory.
 4. I am familiar with biorhythm theory and occasionally or regularly consult or construct a biorhythm chart.
 5. Both 3 and 4.

21. THE BIORHYTHM THEORY

Appendix 5

Paranormal Involvement Scale: fourth version

PLEASE MAKE NO MARKS ON THESE PAGES

WRITE THE NUMBER OF YOUR CHOICE ON THE SEPARATE ANSWER SHEET

For items 1 to 14, please put in the appropriate box on your Answer Sheet the number which best describes your degree of involvement in each area. There are no right or wrong answers. This is a sample of your own degree of involvement. Please read all the choices for each item carefully before you make your choice, and try to select a number for each item.

1. Traditional religious beliefs involve belief in God, the soul, the devil, heaven and hell.
 1. I have never heard of traditional religious beliefs.
 2. I know what religious beliefs are but do not concern myself with them.
 3. I personally know someone who follows traditional religious beliefs.
 4. I occasionally read books or articles about traditional religious beliefs.
 5. I myself follow traditional religious beliefs.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4, and 5.

2. Psychokinesis is the production of movement in inanimate objects by the use of psychic powers or mental forces.
 1. I have never heard of psychokinesis.
 2. I know what psychokinesis is but do not concern myself with it.
 3. I personally know someone who claims to have experienced psychokinesis.
 4. I occasionally read books or articles about psychokinesis.
 5. I myself have experienced psychokinesis.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.

3. Telepathy is the direct communication of thoughts from mind to mind without the use of normal senses.
 1. I have never heard of telepathy.
 2. I know what telepathy is but do not concern myself with it.
 3. I personally know someone who claims to have experienced telepathy.
 4. I occasionally read books or articles about telepathy.
 5. I myself have experienced telepathy.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.

4. Witchcraft is an occult (hidden meaning) practice which involves the use of magic, sorcery and the casting of spells on persons or objects.
1. I have never heard of witchcraft.
 2. I know what witchcraft is but do not concern myself with it.
 3. I personally know someone who claims to practice witchcraft.
 4. I occasionally read books or articles about witchcraft.
 5. I myself have participated in or practiced witchcraft.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.
5. Some people avoid walking under ladders or are cautious in dealing with things associated with the number "13".
1. I have never heard of such behaviour.
 2. I know what this behaviour involves but do not concern myself with it.
 3. I personally know someone who tends to avoid walking under ladders or is cautious in dealing with things associated with the number "13", and similar behaviour.
 4. I occasionally show interest in articles or ads for lucky charms.
 5. I myself tend to avoid walking under ladders or am cautious in dealing with things associated with the number "13", and similar behaviour.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.
6. Astral projection is the separation of the consciousness of a person from the physical body during a trance or meditative state or during states of sleep, allowing the disembodied consciousness of the person to pass through walls, see events occurring at a distance from the physical body of the meditating or sleeping person, or even to pass into outer space before returning.
1. I have never heard of astral projection.
 2. I know what astral projection is but do not concern myself with it.
 3. I personally know someone who claims to have experienced astral projection.
 4. I occasionally read books or articles about astral projection.
 5. I myself have experienced astral projection.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.
7. Reincarnation is the concept that after death, whether immediately or at some point later, the soul or spirit of the person who died is born again into a new body.
1. I have never heard of reincarnation.
 2. I know what reincarnation is but do not concern myself with it.
 3. I personally know someone who claims to have been reincarnated.
 4. I occasionally read books or articles about reincarnation.
 5. I myself have had experiences or thoughts which have led me to believe that I had a prior life in another body.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.

8. Spiritualism and mediumistic communication involve the concept that the dead communicate with the living, usually through a medium, who is a person thought to have such powers as are necessary to communicate with the spirits of the dead.
1. I have never heard of spiritualism and mediumistic communication.
 2. I know what spritualism and mediumistic communication are but do not concern myself with them.
 3. I personally know someone who claims to have communicated with the spirit of someone dead, or has been present at a seance where a medium supposedly communicated with the spirits of the dead.
 4. I occasionally read books or articles about spiritualism.
 5. I myself have been contacted by the spirit of someone dead. or have attended a seance where a medium supposedly communicated with the spirits of the dead.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.
9. Extraordinary life forms are creatures such as the Loch Ness monster or the abominable snowman of Tibet.
1. I have never heard of extraordinary life forms.
 2. I know what extraordinary life forms are but do not concern myself with them.
 3. I personally know someone who claims to have seen an extraordinary life form.
 4. I occasionally read books or articles about extraordinary life forms.
 5. I myself have seen an extraordinary life form.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.
10. Extraterrestrial visitation is concerned with spacecraft and beings from other planets who have visited the earth.
1. I have never heard of extraterrestrial visitation.
 2. I know what extraterrestrial visitation is but do not concern myself with it.
 3. I personally know someone who claims to have seen an extraterrestrial spacecraft or been contacted by extraterrestrial beings.
 4. I occasionally read books or articles about extraterrestrial visitations.
 5. I myself have seen an extraterrestrial spacecraft or been contacted by extraterrestrial beings.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.

11. Astrology is the concept that the positions and motions of the planets at the time of a person's birth influence that person's personality and from which the times of important events in that person's life can be predicted.
1. I have never heard of astrology.
 2. I know what astrology is but do not concern myself with it.
 3. I personally know someone who believes in astrology and who reads astrological horoscopes for guidance in personal matters.
 4. I occasionally read books or articles about astrology.
 5. I myself have often checked my horoscope for guidance in my life.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.
12. Precognition is the knowledge of some event in advance of its occurrence by some persons who have an unexplained ability to predict the future or which is manifested in some unknown way during the dream states of sleep.
1. I have never heard of precognition.
 2. I know what precognition is but do not concern myself with it.
 3. I personally know someone who claims to have foreseen an event and later that event actually occurred.
 4. I occasionally read books or articles about precognition.
 5. I myself have foreseen an event and later that event actually occurred.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.
13. Tarot cards are a deck of cards used in fortunetelling. On each card is a symbolic scene (for examples: The Fool, The Magician, The Hanged Man, Death). The cards are shuffled and spread to be "read" to reveal hidden influences in a person's life or to foretell future events in that person's life.
1. I have never heard of Tarot cards.
 2. I know what Tarots are but do not concern myself with them.
 3. I personally know someone who owns a Tarot deck and gives readings to him/herself and others.
 4. I occasionally read books or articles about the Tarot.
 5. I myself have a Tarot deck and give readings to myself or others.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.

14. Biorhythm theory holds that a 23-day physical cycle, a 28-day emotional cycle, and a 33-day intellectual cycle are set in motion at the moment of birth. According to the theory, a biorhythm chart can predict "up" days or "down" days, as well as critical days during which accidents are more likely to occur.
1. I have never heard of biorhythm theory.
 2. I know what biorhythms are but do not concern myself with them.
 3. I personally know someone who occasionally or regularly consults a biorhythm chart.
 4. I occasionally read books or articles about biorhythm theory.
 5. I am familiar with biorhythm theory and occasionally or regularly consult or construct a biorhythm chart.
 6. Both 3 and 4.
 7. Both 3 and 5.
 8. 3, 4 and 5.

Appendix 6

Paranormal Involvement Scale: fifth (final) version

PLEASE MAKE NO MARKS ON THESE PAGES

WRITE THE NUMBER OF YOUR CHOICE ON THE SEPARATE ANSWER SHEET

For items 1 to 14, please read the statement which describes the phenomenon. then read the choices following the description.

Put in the appropriate box on your Answer Sheet the number which best describes your degree of involvement in each area. There are no right or wrong answers. This is a sample of your own degree of involvement.

Please read all the choices for each item carefully before you make your choice. and try to select a number for each item.

1. Traditional religious beliefs involve belief in God, the soul, the devil, heaven and hell.
 1. I have never heard of traditional religious beliefs.
 2. I know what religious beliefs are but do not concern myself with them.
 3. I have on occasion read books or articles about traditional religious beliefs.
 4. I actively seek information about traditional religious beliefs.
 5. I myself have followed traditional religious beliefs.
 6. Both 3 and 5.
 7. Both 4 and 5.

2. Psychokinesis is the production of movement in inanimate objects by the use of psychic powers or mental forces.
 1. I have never heard of psychokinesis.
 2. I know what psychokinesis is but do not concern myself with it.
 3. I have on occasion read books or articles about psychokinesis.
 4. I actively seek information about psychokinesis.
 5. I myself have experienced psychokinesis.
 6. Both 3 and 5.
 7. Both 4 and 5.

3. Telepathy is the direct communication of thoughts from mind to mind without the use of normal senses.
 1. I have never heard of telepathy.
 2. I know what telepathy is but do not concern myself with it.
 3. I have on occasion read books or articles about telepathy.
 4. I actively seek information about telepathy.
 5. I myself have experienced telepathy.
 6. Both 3 and 5.
 7. Both 4 and 5.

4. Witchcraft is an occult (hidden meaning) practice which involves the use of magic, sorcery and the casting of spells on persons or objects.
1. I have never heard of witchcraft.
 2. I know what witchcraft is but do not concern myself with it.
 3. I have on occasion read books or articles about witchcraft.
 4. I actively seek information about witchcraft.
 5. I myself have participated in or practiced witchcraft.
 6. Both 3 and 5.
 7. Both 4 and 5.
5. Some people avoid walking under ladders or are cautious in dealing with things associated with the number "13".
1. I have never heard of such behaviour.
 2. I know what this behaviour involves but do not concern myself with it.
 3. I have on occasion shown interest in articles or ads for lucky charms.
 4. I actively seek information about lucky charms or ways of avoiding bad luck.
 5. I myself tend to avoid walking under ladders or am cautious in dealing with things associated with the number "13", and similar behaviour.
 6. Both 3 and 5.
 7. Both 4 and 5.
6. Astral projection is the separation of the consciousness of a person from the physical body during a trance or meditative state or during states of sleep, allowing the disembodied consciousness of the person to pass through walls, see events occurring at a distance from the physical body of the meditating or sleeping person, or even to pass into outer space before returning.
1. I have never heard of astral projection.
 2. I know what astral projection is but do not concern myself with it.
 3. I have on occasion read books or articles about astral projection.
 4. I actively seek information about astral projection.
 5. I myself have experienced astral projection.
 6. Both 3 and 5.
 7. Both 4 and 5.
7. Reincarnation is the concept that after death, whether immediately or at some point later, the soul or spirit of the person who died is born again into a new body.
1. I have never heard of reincarnation.
 2. I know what reincarnation is but do not concern myself with it.
 3. I have on occasion read books or articles about reincarnation.
 4. I actively seek information about reincarnation.
 5. I myself have had experiences or thoughts which have led me to believe that I had a prior life in another body.
 6. Both 3 and 5.
 7. Both 4 and 5.

8. Spiritualism and mediumistic communication involve the concept that the dead communicate with the living, usually through a medium, who is a person thought to have such powers as are necessary to communicate with the spirits of the dead.
1. I have never heard of spiritualism and mediumistic communication.
 2. I know what spritualism and mediumistic communication are but do not concern myself with them.
 3. I have on occasion read books or articles about spiritualism.
 4. I actively seek information about spiritualism.
 5. I myself have been contacted by the spirit of someone dead, or have attended a seance where a medium supposedly communicated with the spirits of the dead.
 6. Both 3 and 5.
 7. Both 4 and 5.
9. Extraordinary life forms are creatures such as the Loch Ness monster or the abominable snowman of Tibet.
1. I have never heard of extraordinary life forms.
 2. I know what extraordinary life forms are but do not concern myself with them.
 3. I have on occasion read books or articles about extraordinary life forms.
 4. I actively seek information about extraordinary life forms.
 5. I myself have seen an extraordinary life form.
 6. Both 3 and 5.
 7. Both 4 and 5.
10. Extraterrestrial visitation is concerned with spacecraft and beings from other planets who have visited the earth.
1. I have never heard of extraterrestrial visitation.
 2. I know what extraterrestrial visitation is but do not concern myself with it.
 3. I have on occasion read books or articles about extraterrestrial visitations.
 4. I actively seek information about extraterrestrial visitation.
 5. I myself have seen an extraterrestrial spacecraft or been contacted by extraterrestrial beings.
 6. Both 3 and 5.
 7. Both 4 and 5.
11. Astrology is the concept that the positions and motions of the planets at the time of a person's birth influence that person's personality and from which the times of important events in that person's life can be predicted.
1. I have never heard of astrology.
 2. I know what astrology is but do not concern myself with it.
 3. I have on occasion read books or articles about astrology, had my astrological chart done, or checked my horoscope.
 4. I actively seek information about astrology.
 5. I myself have often checked my horoscope for guidance in my life.
 6. Both 3 and 5.
 7. Both 4 and 5.

2. Precognition is the knowledge of some event in advance of its occurrence by some persons who have an unexplained ability to predict the future or which is manifested in some unknown way during the dream states of sleep.
1. I have never heard of precognition.
 2. I know what precognition is but do not concern myself with it.
 3. I have on occasion read books or articles about precognition.
 4. I actively seek information about precognition.
 5. I myself have foreseen an event and later that event actually occurred.
 6. Both 3 and 5.
 7. Both 4 and 5.
3. Tarot cards are a deck of cards used in fortunetelling. On each card is a symbolic scene (for examples: The Fool, The Magician, The Hanged Man, Death). The cards are shuffled and spread to be "read" to reveal hidden influences in a person's life or to foretell future events in that person's life.
1. I have never heard of Tarot cards.
 2. I know what Tarot cards are but do not concern myself with them.
 3. I have on occasion read books or articles about the Tarot, or had a Tarot reading.
 4. I actively seek information about the Tarot.
 5. I myself have a Tarot deck and give readings to myself or others.
 6. Both 3 and 5.
 7. Both 4 and 5.
4. Biorhythm theory holds that a 23-day physical cycle, a 28-day emotional cycle, and a 33-day intellectual cycle are set in motion at the moment of birth. According to the theory, a biorhythm chart can predict "up" days or "down" days, as well as critical days during which accidents are more likely to occur.
1. I have never heard of biorhythm theory.
 2. I know what biorhythms are but do not concern myself with them.
 3. I have on occasion read books or articles about biorhythms, or had my biorhythm chart done.
 4. I actively seek information about biorhythms.
 5. I myself have often consulted or constructed a biorhythm chart for guidance in my life.
 6. Both 3 and 5.
 7. Both 4 and 5.

PLEASE CONTINUE ON THE FOLLOWING PAGE ...

Department of Psychology

PERSONALITY CORRELATES OF BELIEF AND INVOLVEMENT IN ANOMALOUS PHENOMENA

ANSWER SHEET

Instructions:

Please enter your answers (one digit per box) beneath the appropriate item number.

If you change your mind, cross out your original answer and enter the correction below the box. Please ignore the small subscripts beside the lower boxes.

1	2	3	4	5	6	7	8	9	10
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

11	12	13	14	15	16	17	18	19	20
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

21	22	23	24	25	26	27	28	29	30
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

31	32	33	34	35	36	37	38	39	40
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

41	42	43	44	45
<input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> 48

E	—	—	—	I 54
S	—	—	—	N 60
T	—	—	—	F 66
J	—	—	—	P 72

TYPE

<input type="text"/>	<input type="text"/>
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74

Table 2

Revised Paranormal Belief Scale

Please put a number next to each item to indicate how much you agree or disagree with that item. Use the numbers as indicated below. There are no right or wrong answers. This is a sample of your own beliefs and attitudes. Thank you.

1=Strongly Disagree 2=Moderately Disagree 3=Slightly Disagree
4=Uncertain 5=Slightly Agree 6=Moderately Agree 7=Strongly Agree

1. The soul continues to exist though the body may die.
2. Some individuals are able to levitate (lift) objects through mental forces.
3. Black magic really exists.
4. Black cats can bring bad luck.
5. Your mind or soul can leave your body and travel (astral projection).
6. The abominable snowman of Tibet exists.
7. Astrology is a way to accurately predict the future.
8. There is a devil.
9. Psychokinesis, the movement of objects through psychic powers, does exist.
10. Witches do exist.
11. If you break a mirror, you will have bad luck.
12. During altered states, such as sleep or trances, the spirit can leave the body.
13. The Loch Ness monster of Scotland exists.
14. The horoscope accurately tells a person's future.
15. I believe in God.
16. A person's thoughts can influence the movement of a physical object.
17. Through the use of formulas and incantations, it is possible to cast spells on persons.
18. The number "13" is unlucky.
19. Reincarnation does occur.
20. There is life on other planets.
21. Some psychics can accurately predict the future.
22. There is a heaven and a hell.
23. Mind reading is not possible.
24. There are actual cases of witchcraft.
25. It is possible to communicate with the dead.
26. Some people have an unexplained ability to predict the future.

Note: Item 23 is reversed for scoring.

Traditional Religious Belief = Mean Items (1,8,15,22)

Psi = Mean Items (2,9,16,23)

Witchcraft = Mean Items (3,10,17,24)

Superstition = Mean Items (4,11,18)

Spiritualism = Mean Items (5,12,19,25)

Extraordinary Life Forms = Mean Items (6,13,20)

Precognition = Mean Items (7,14,21,26)