

RESEARCH

Common Paranormal Belief Dimensions

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Abstract—Several measures of paranormal belief have been developed and employed by researchers of published work. Despite this, there is considerable debate about the nature and structure of paranormal belief. Particularly, authors remain uncertain about which belief subsets should be included within paranormal scales. The current study extended existing research by exploring shared variance across different paranormal measures. An extensive literature review was undertaken in order to identify measures of paranormal belief. The independent scale items were then combined to produce a 124-item composite measure. This was distributed in paper form and electronically via the Internet. Respondents were recruited face to face, by email, and by post. In total, 1,481 respondents completed the measure: 548 the paper version and 933 online. Exploratory factor analysis (principal components analysis) was performed, and a nine-factor structure emerged. This contained item clusters measuring belief in: Hauntings, Other Life, Superstition, Religious Belief, Alien Visitation, Extrasensory Perception (ESP), Psychokinesis (PK), Astrology, and Witchcraft.

Keywords: paranormal beliefs—Paranormal Belief Scale (PBS)—R-PBS—Paranormal Short Inventory (PSI) —Australian Sheep–Goat Scale (ASGS)—Anomalous Experiences Inventory (AEI)

Introduction

The investigation of paranormal belief has proved to be a fertile avenue of psychological and parapsychological inquiry. The majority of research has employed self-report measures, and several scales have been developed (Blackmore & Troscianko, 1985, Davis, Peterson, & Farley, 1974, Jones, Russell, & Nickel, 1977, McGarry & Newberry, 1981, Murphy & Lester, 1976,

Otis & Alcock, 1982, Randall & Desrosiers, 1980, Thalbourne & Delin, 1993, Windholtz & Diamant, 1974). While this approach has successfully produced a wealth of published findings, the validity and content of these paranormal measures has been frequently questioned (Lawrence, 1995).

This can best be illustrated by reference to the Paranormal Belief Scale (PBS, Tobacyk & Milford, 1983; later revised by Tobacyk, 1988, R-PBS), which is the most widely used measure of paranormal belief (Goulding & Parker, 2001). The R-PBS includes a range of phenomena that extend beyond the traditional domain of parapsychology (traditional religious belief, psi, witchcraft, superstition, spiritualism, extraordinary life forms, and precognition). This breadth contrasts with the other commonly used measure, the Australian Sheep–Goat Scale (ASGS) (Thalbourne & Delin, 1993), which restricts measurement to the subset of core beliefs studied by parapsychology: extrasensory perception (ESP), psychokinesis (PK), and life after death. The three ASGS factors have been found to be highly correlated, and, consequently, several researchers have used the ASGS as a measure of belief in psychic ability (Thalbourne, 1995a, 1995b, Thalbourne & Delin, 1993, Thalbourne, Dunbar, & Delin, 1995, Wiseman & Watt, 2006). Paradoxically, the strength of the R-PBS, its extensiveness, has also attracted criticism (i.e. the inclusion of religious items and those measuring extraordinary life forms).

The inclusion of religious belief items is problematic because there is dispute regarding the relationship between paranormal and religious beliefs. Tobacyk and Milford (1983) argue that religious and other paranormal beliefs originate in the same fundamental human experience. In support of this hypothesis, several studies have documented a positive relationship between religious and paranormal beliefs (e.g., Goode, 2000, Irwin, 1985, Orestein, 2002). However, other studies have suggested that paranormal belief functions as a set of substitute beliefs for people outside mainstream religions (Emmons & Sobal, 1981). This view is supported by several studies (e.g., Bainbridge & Stark, 1980, Tobacyk & Wilkinson, 1990) that have noted an inverse relationship between religious beliefs and the endorsement of paranormal phenomena.

Pertinently, Thalbourne and O'Brien (1999), using the ASGS, obtained findings that varied in accordance with the measure of religiosity used. In particular, they found an almost significant negative correlation with the Religion–Puritanism Scale from the Wilson–Patterson Attitude Scale (Wilson, 1975), a correlation close to zero with the traditional religious beliefs subscale from the R-PBS, and a significant positive correlation with the religiosity scale from Haraldsson (Haraldsson, 1981). Such findings illustrate that the relationship between religiosity and paranormal belief remains inconclusive and may explain why items relating to religiosity continue to be incorporated into paranormal measures.

Connected to the previous point is the notion that some R-PBS items are of dubious “paranormality.” This criticism applies particularly to the Extraordinary Life Forms subscale, which contains questions about: the abominable snowman of Tibet, life on other planets, and the Loch Ness monster. Considering this final item, Lawrence (1995) argued that the mystery surrounding the Loch Ness monster originated from the creature’s elusiveness rather than from the possession of paranormal characteristics.

Finally, recent criticisms have centered on Differential Item Functioning (DIF), the observation that responses vary as a function of age and gender rather than level of belief (Lange, Irwin, & Houran, 2000). Lange, Irwin, and Houran (2000) argue that DIF results in the emergence of “phantom factors” that undermine the structure of paranormal belief. To address this, Lange, Irwin, and Houran (2000) employed Rasch scaling to eliminate DIF in the R-PBS. This led them to propose the existence of two clusters of items (New Age Philosophy and Traditional Paranormal Beliefs). This two-factor model has subsequently been adopted by several researchers (e.g., Irwin, 2003, Thalbourne, 2001), who have reported good construct validity (Houran & Lange, 2001). Despite these positive comments, the purification of the R-PBS has not been entirely satisfactory; several original items have failed to load on either factor. Consequently, Lange, Irwin, and Houran (2000) have acknowledged that the addition of new items may produce additional belief clusters. Similarly, Lange and Thalbourne (2002) have subjected the ASGS to Rasch scaling.

Many of the R-PBS problems arise from a lack of theoretical clarity within parapsychology. Particularly, there is no single, agreed-upon definition of what constitutes paranormal belief. Goode (2002) delineates “paranormalism” as belief in any power or force, which the overwhelming majority of scientists argue violates a basic scientific rule, principle, or law. This may explain why, despite its breadth, the R-PBS fails to include beliefs that could be considered as important dimensions of paranormal belief. This criticism is particularly relevant in the context of the ASGS and other measures of paranormal belief, such as the Paranormal Short Inventory (PSI) (Randall, 1997), which have chosen to adopt more narrow definitions of paranormality.

The consequence of this lack of consensus is the apparent neglect of potentially important facets of paranormal belief (i.e. ghost and poltergeist experiences and alien life forms). Considering ghost and poltergeist experiences first, these are closely interwoven with the notion of spirits and the survival hypothesis (Irwin & Watt, 2006), and therefore would be expected to be key tenets of any paranormal belief measure. Indeed, the survival hypothesis represents one of the key domains of parapsychological interest. For this reason it is surprising that haunting, ghost, and poltergeist experiences are largely absent from scales measuring belief in the paranormal; both the R-PBS and

ASGS contain items designed to tap into religiosity and spiritualism rather than haunting experiences.

Further to this point, the Anomalous Experiences Inventory (Kumar, Pekala, & Gallagher, 1994), includes eight items (Poltergeist subscale), which have been judged to parallel experiences typical of haunting and poltergeist activity. Houran and Thalbourne (2001a, 2001b) found a positive correlation between these items and the ASGS ($r = .54$), suggesting that belief in such phenomena may be related to general paranormal belief. Surprisingly, despite containing items relating to life after death, neither the R-PBS nor the ASGS make specific reference to hauntings.

Similarly, the R-PBS also provides only partial measurement of belief in extraterrestrial life: one item on the Extraordinary Life Forms subscale (c.f., "There is life on other planets"). This item enquires about the less radical and more credible belief that there may be life on other planets, a belief endorsed by non-believers (Lawrence, 1995). Additionally, the ASGS makes no reference to alien life or visitation. This is somewhat counterintuitive because ideas endorsed by UFO advocates typically extend beyond beliefs relating to life on other planets to encompass those for which there is a greater degree of debate. Although some scholars are willing to interpret certain forms of evidence as indicating an extraterrestrial presence (e.g., Carlotto, 1997, 2002, Crater & McDaniel, 1999, DiPietro, Molenaar, & Brandenburg, 1988, Friedman, 2008, O'Leary, 1990, Sitchin, 1976), there is much less acceptance of this among the mainstream scientific community. In this context, endorsement of items concerning alien visitation could be considered to be paranormal (Lawrence, 1995).

Support for this view is provided by reference to Diaz-Vilela and Alvarez-Gonzalez (2004). They administered the R-PBS with additional items, assessing belief in extraterrestrial life and UFO visitations. Factor analysis of responses revealed that the additional items clustered to produce an additional factor tapping into beliefs about extraterrestrial life and its presence on earth. This suggests that belief in extraterrestrial life and alien visitation of earth may represent additional facets of paranormal belief.

The present study was designed to expand upon current understanding of paranormal belief. An extensive search of the literature was undertaken and several different measures of paranormal belief were identified. These scales were then combined into a composite measure representing a range of paranormal beliefs. It was anticipated that this approach would enable the authors to examine several important questions. Firstly, the composite measure allowed the conceptual overlap between independent measures of paranormal belief (R-PBS, ASGS, etc.) to be explored. The purpose of this being to determine whether subsequent studies could plausibly combine items and subscales into coherent belief dimensions (e.g., belief in ghosts and spiritualism).

Secondly, combining the measures enabled the current study to examine the relationship between established dimensions of paranormal belief (e.g., PK and ESP) and dimensions previously studied independently (e.g., haunting/poltergeist activity and alien life/visitation). It was expected that this would indicate whether the previously under-researched dimensions were related to general paranormal belief in the same way as established dimensions.

Finally, the current study sought to identify interscale dimensions of paranormal belief. These are common factors produced by combining individual scale items, the purpose being to identify factors of belief not currently measured by established measures. For example, the authors wanted to explore whether alien-related beliefs (life on other planets and alien visitations) were related to extraordinary life forms as suggested by the R-PBS. Further on this point, the current study was designed to test the notion that belief in extraterrestrial life and alien visitation represent additional facets of paranormal belief (Diaz-Vilela & Alvarez-Gonzalez, 2004).

In summary, there are currently a number of scales measuring paranormal belief. These measures share considerable common variance. For example, the ASGS, R-PBS, and PSI all contain items measuring belief in ESP, PK, and life after death. To identify shared variance and reduce item redundancy, the scales were combined and principal components analysis (PCA) was performed. It was anticipated that this analysis would identify a number of discrete paranormal belief factors.

Methods

Materials and Procedure

The measure of paranormal belief used in the current study was constructed by amalgamating items (107) from existing scales (detailed below) and by the addition of new items (17) relating to belief in extraterrestrial life, UFO visitations, and hauntings. Where necessary, items from the existing scales were modified so that they appeared as statements of belief as opposed to questions, e.g., the item “Have you avoided walking under a ladder because it is associated with bad luck?” from the Superstition subscale was modified to “I have avoided walking under a ladder because it is associated with bad luck.” All items were responded to on a 5-point scale ranging from 1 “strongly disagree” to 5 “strongly agree,” and were randomly ordered so that they appeared in a single 124-item self-report questionnaire.

The original scales used in constructing the questionnaire for this research were as follows:

Revised Paranormal Belief Scale (R-PBS) (Tobacyk & Milford, 1983, Tobacyk, 1988, Lange, Irwin, & Houran, 2000). The R-PBS is a 26-

item self-report questionnaire assessing seven facets of paranormal belief, including: traditional religious belief, psi, witchcraft, superstition, spiritualism, extraordinary life forms, and precognition. Participants are presented with statements such as “there is a devil” and “witches do exist” and respond on a scale ranging from 1 (strongly disagree) to 7 (strongly agree), with higher scores reflecting greater paranormal belief. The R-PBS has been demonstrated to possess adequate validity (Tobacyk, 1995a, 1995b, 2004). Overall, the R-PBS is considered to be a conceptually and psychometrically satisfactory measure of paranormal belief (Tobacyk, 2004).

Australian Sheep–Goat Scale (ASGS) (Thalbourne & Delin, 1993). The ASGS measures belief in, and alleged experience of, the subset of paranormal beliefs studied by parapsychology. It consists of 18 items that relate to three core concepts of parapsychology: life after death, psychokinesis, and extrasensory perception (the latter two referred to previously as PK and ESP). While independent, scores on the three subscales have been found to be highly correlated to the extent that the ASGS is commonly considered to measure belief in psychic ability (Thalbourne, 1995a, 1995b, Thalbourne & Delin, 1993, Thalbourne, Dunbar, & Delin, 1995, Wiseman & Watt, 2006). The ASGS response options are: False (scored as zero), “?” (Don’t know: scored as 1 point), and True (scored as 2 points). The scale has a range from 0 to 36, higher scores indicating higher levels of belief and experience. The ASGS has proven reliability and validity (Thalbourne, 1995a, Thalbourne & Delin, 1993).

Paranormal Short Inventory (PSI) (Randall, 1997). PSI is a 13-item scale, modified from the longer Supernaturalism Scale (Randall & Desrosiers, 1980), which measures precognition, ESP, astrology, magical/ritual, and UFO beliefs. Items are scored on a 6-point scale from 1 “strongly disagree” to 6 “strongly agree,” with higher scores reflecting greater paranormal belief. Total scores range from 13 to 78. The PSI has been found to possess highly satisfactory internal consistency, Cronbach’s alpha (α); ($\alpha = .83$) (Randall, 1997).

Manchester Metropolitan University Scale of Paranormal Belief (Foster, 2001). An unpublished scale consisting of 28 items relating to a range of paranormal phenomena including: psychokinesis (PK), extrasensory perception (ESP), life after death, astrology, extraordinary life forms, UFOs, hauntings, faith healing, and anomalous phenomena. Items are scored along a 5-point scale, from 1 “strongly disagree” to 5 “strongly agree,” with higher scores reflecting greater paranormal belief. Although unpublished, the scale has been previously presented to two student groups. 253 (183 female and 70 male) first-year students enrolled for degree courses in psychology, biology, or law at the Manchester Metropolitan University (MMU). A further set of responses was

obtained from another, similar group of 82 students of whom 24 were male. The alpha coefficient of the MMU Paranormal Belief Scale was found to be highly satisfactory ($\alpha = .92$ for group 1, and $\alpha = .88$ for group 2).

Superstition Scale (Wiseman & Watt, 2004). Contains six items, three relating to negative superstitious belief, e.g., “Have you avoided walking under a ladder because it is associated with bad luck?”, and three relating to positive superstitious belief, e.g., “Do you say ‘fingers crossed,’ or actually cross your fingers?” Items are scored on a 5-point scale ranging from 1 “Definitely no” to 5 “Definitely yes.” The internal reliability for the scales was assessed using Cronbach’s alpha: Negative superstition items were found to possess good internal reliability ($\alpha = .84$), positive superstition items had acceptable internal reliability ($\alpha = .68$), and overall the superstition items have been found to demonstrate good internal reliability ($\alpha = .83$) (Dagnall, Parker, & Munley, 2007).

Poltergeists and Hauntings Scale (Kumar & Pekala, 2001). Contains eight items relating to experiences typical of haunts and poltergeist, which address two broad types of occurrences: firstly, seemingly subjective phenomena, such as apparitions, and secondly, more objective phenomena that involve the physical environment, such as object movements (Houran & Lange, 2001). The scale was derived from the Anomalous Experiences Inventory (AEI) (Kumar, Pekala, & Gallagher, 1994). The AEI contains 70 items that form five subscales: Anomalous/Paranormal Experience, Anomalous/Paranormal Belief, Anomalous/Paranormal Ability, Fear of the Anomalous/Paranormal, and Drug Use (Kumar, Pekala, & Gallagher, 1994). The Poltergeists and Hauntings Scale was constructed on the basis of face validity and possesses acceptable internal reliability (Kuder–Richardson Formula 20; KR 20 = .70). The subscale has previously been used in published work (Kumar & Pekala, 2001).

Extraterrestrial Life and UFO-Related Belief Scale (Chequers, Joseph, & Diduca, 1997). Contains eight items relating to beliefs that life exists elsewhere in the universe, alien life forms are influencing what happens on earth, and human beings are being abducted by aliens. Items are answered either “yes” or “no” and scored as 1 or 0, respectively, so that higher scores reflect stronger belief. Scores on the belief scale range from 0 to 8. The scale has been found to possess acceptable internal reliability ($\alpha = .75$) (Chequers, Joseph, & Diduca, 1997).

Additional Items. The Poltergeists and Hauntings Scale (Kumar & Pekala, 2001) and the Extraterrestrial life and UFO-related beliefs items (Chequers, Joseph, & Diduca, 1997) both only measure a limited range of related beliefs.

For this reason, additional items were generated, seven related to poltergeists and hauntings and ten related to life on other planets and alien visitations. These additional items were produced by exploring reports of common haunting and alien-related experiences. They therefore had good face validity.

Participants

1,481 participants completed the questionnaire. Ages ranged from 14 to 70 years, with a mean of 27.44, a standard deviation of 11, median of 23 (lower quartile 19 and upper quartile 33); 75.1% were female and 24.9% were male. Of the total number of participants, 538 participants (37%) completed the questionnaire in a paper/pencil form, while 933 (63%) completed a Web-based version of the questionnaire. Respondents were recruited through a range of sources: Student participants were recruited via undergraduate psychology classes and through contacts at local colleges. Respondents were also generated through advertisement of the study via emails to staff and students at the university and via posters placed around the university campus. Participation was voluntary, and respondents could terminate their participation at any time during the study.

Procedure

All participants were informed that the questionnaire was concerned with belief in paranormal phenomena. Participants were told that there was no time limit for completing the questionnaire. Those who completed the paper versions of the questionnaire were asked to answer all items. For those who completed the online version, all items were mandatory: Participants could not move on to the next Web page without responding to every item on the current page. At the end of both versions of the questionnaire, an optional question appeared asking participants if there were any other areas/subjects that they believed should be included in a questionnaire on paranormal belief.

Results

Exploration of the Empirical Structure of the Questionnaire

Participants' questionnaire responses were subjected to principal components analysis (PCA) with oblique (direct oblimin) rotation. Prior to conducting PCA, the correctness of the data for factor analysis was assessed. The data was found to be suitable: The Kaiser–Mayer–Oklin value (.983) exceeded the recommended value of .6 (Kaiser, 1970, 1974); Bartlett's Test of Sphericity (Barlett, 1954) was significant (Chi-square, $\chi^2 = 148011.16$, $df = 7626$, $p < .001$), and the correlation matrix contained many coefficients of .3 or above.

TABLE 1
Descriptives for the Paranormal Belief Factors

| Factors | Mean | SD | Alpha |
|---------------------|------|------|----------------|
| 1. Hauntings | 2.94 | 1.05 | $\alpha = .96$ |
| 2. Other Life | 3.60 | 0.81 | $\alpha = .91$ |
| 3. Superstition | 2.70 | 0.95 | $\alpha = .90$ |
| 4. Religious Belief | 3.09 | 1.05 | $\alpha = .91$ |
| 5. Alien Visitation | 2.22 | 0.83 | $\alpha = .95$ |
| 6. ESP | 2.94 | 0.93 | $\alpha = .89$ |
| 7. PK | 2.36 | 0.89 | $\alpha = .93$ |
| 8. Astrology | 2.37 | 0.84 | $\alpha = .91$ |
| 9. Witchcraft | 2.92 | 1.02 | $\alpha = .84$ |

In line with Comrey and Lee (1992), an item-loading cutoff value of .45 was selected; Comrey and Lee (1992) suggest that items loadings above this value provide a good measure of a factor. The initial PCA resulted in a solution comprising 18 factors with eigenvalues of greater than 1, accounting for 66.85% of the total variance. Inspection of the pattern matrix revealed factors 13–18 comprising two or fewer items and therefore were not considered to contain sufficient items to represent reliable factors. Reliability analysis in the form of Cronbach's alpha (α) revealed that the items Factor 9 comprised had very low internal reliability, $\alpha < .3$.

Following the initial PCA and subsequent reliability analysis, a second PCA was undertaken. This included items that loaded on factors composed of three or more items and which collectively produced an acceptable internal reliability coefficient ($\alpha \geq .7$). In addition to this, one item was removed in cases where the correlation between a pair of items was greater than .9. This resulted in a reduced dataset of 67 items.

The second PCA provided a solution comprising 11 factors with eigenvalues of greater than 1, accounting for 68.96% of the total variance. Inspection of the pattern matrix revealed that the final factor comprised only one item, and Factors 7 (the existence of PK) and 10 (one's own PK abilities) demonstrated considerable conceptual overlap, and the two factors were highly intercorrelated, $r = .71$.

In light of this, a final PCA was undertaken restricted to a nine-factor solution (see Table 1). The PCA accounted for 71.12% of the total variance. All emergent factors had eigenvalues exceeding 1, demonstrated good levels of internal consistency, and were conceptually distinct (see Table 2):

TABLE 2
Paranormal Belief Factor Loading

| Factor and abridged item | Communalities | | | | | | | | |
|---|---------------|-----|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Factor 1: Haunting | | | | | | | | | |
| Additional 84 Ghosts exist | .82 | .66 | | | | | | | |
| MMU 36 Spirits of the dead can be seen by the living | .80 | .64 | | | | | | | |
| MMU 1 Some places are haunted by spirits or souls of people now dead | .75 | .62 | | | | | | | |
| R-PBS 4 It is possible to communicate with the dead | .76 | .60 | | | | | | | |
| PSI 61 Contrary to scientific belief, some people can make contact with the dead | .80 | .60 | | | | | | | |
| Additional 21 People have genuinely seen "ghosts" or "apparitions" | .75 | .57 | | | | | | | |
| Additional 111 Poltergeists exist | .72 | .53 | | | | | | | |
| Additional 63 Ghosts/poltergeists can cause objects to appear or disappear (materialisation or dematerialisation) | .68 | .48 | | | | | | | |
| MMU 20 Somewhere in the universe there are other forms of life | .76 | .90 | | | | | | | |
| Additional 76 The earth is the only planet in the universe that supports life | .74 | .86 | | | | | | | |
| Additional 109 The only intelligent life exists on earth | .74 | .85 | | | | | | | |
| R-PBS 118 There is life on other planets | .70 | .81 | | | | | | | |
| Additional 8 Intelligent life exists beyond our universe | .62 | .75 | | | | | | | |
| MMU 119 There is no such thing as extra-terrestrial life | .64 | .74 | | | | | | | |
| Wiseman 87 I have avoided walking under a ladder because it is bad luck | .68 | .82 | | | | | | | |
| R-PBS 89 If you break a mirror, you will have bad luck | .69 | .78 | | | | | | | |
| Wiseman 12 I would be anxious about breaking a mirror because it is thought to cause bad luck | .76 | .78 | | | | | | | |
| Wiseman 66 I am superstitious about the number 13 because it is associated with bad luck | .66 | .77 | | | | | | | |
| R-PBS 113 The number "13" is unlucky | .68 | .76 | | | | | | | |
| Wiseman 110 I do say "touch wood" or actually touch wood to promote good luck | .57 | .71 | | | | | | | |
| Wiseman 16 I do say "fingers crossed" or actually cross my fingers to promote good luck | .51 | .71 | | | | | | | |
| R-PBS 38 I believe in God | .75 | .90 | | | | | | | |
| R-PBS 92 There is a heaven and there is a hell | .81 | .86 | | | | | | | |
| R-PBS 28 There is a devil | .72 | .82 | | | | | | | |
| ASGS 123 I believe in life after death | .79 | .65 | | | | | | | |
| MMU 117 There is no such thing as an afterlife | .71 | .63 | | | | | | | |
| MMU 17 The soul continues to exist after the death of the body | .71 | .57 | | | | | | | |
| Chequers 34 Aliens are abducting human beings | .74 | .87 | | | | | | | |
| Additional 53 People have been taken on board alien spaceships | .78 | .87 | | | | | | | |
| Additional 82 Alien spaceships regularly visit earth | .77 | .86 | | | | | | | |
| Additional 121 Alien spaceships have crash landed on earth | .77 | .84 | | | | | | | |

TABLE 2 continued

| Factor and abridged item | Communalities | | | | | | | | | FACTORS | | | | | | | | |
|--|---------------|---|---|---|---|---|---|---|---|---------|---|---|---|-----|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Factor 5: Alien Visitation | | | | | | | | | | | | | | | | | | |
| Additional 106 Aliens have implanted objects into people | .76 | | | | | | | | | | | | | .84 | | | | |
| Additional 70 Alien intelligence is responsible for some UFO sightings | .72 | | | | | | | | | | | | | .75 | | | | |
| Additional 112 Extra-terrestrials have visited earth throughout history | .77 | | | | | | | | | | | | | .73 | | | | |
| MMU 41 Unidentified Flying Objects (UFOs) suggest that some kind of extra-terrestrial life form has approached the surface of the earth | .70 | | | | | | | | | | | | | .63 | | | | |
| Factor 6: ESP | | | | | | | | | | | | | | | | | | |
| ASGS 29 I have had at least one premonition about the future that came true and which I believe was not just a coincidence | .76 | | | | | | | | | | | | | .88 | | | | |
| ASGS 68 I have had at least one dream that came true and which I believe was not just a coincidence | .74 | | | | | | | | | | | | | .82 | | | | |
| ASGS 102 I have had at least one hunch that turned out to be correct and which I believe was not just a coincidence | .65 | | | | | | | | | | | | | .74 | | | | |
| ASGS 56 I believe I have had personal experience of extrasensory perception (ESP) | .62 | | | | | | | | | | | | | .70 | | | | |
| ASGS 81 I believe I have had at least one experience of telepathy between myself and another person | .59 | | | | | | | | | | | | | .67 | | | | |
| MMU 23 Some people have visions or dreams of the future which come true | .55 | | | | | | | | | | | | | .57 | | | | |
| MMU 91 When dreams seem to foretell the future, it is just a coincidence | .61 | | | | | | | | | | | | | .49 | | | | |
| R-PBS 94 A person's thoughts can influence the movement of a physical object | .82 | | | | | | | | | | | | | .88 | | | | |
| MMU 18 Some people, if they exert enough will power, can make objects move just by the power of their mind | .79 | | | | | | | | | | | | | .88 | | | | |
| PSI 52 In spite of the laws of science, some people can use their psychic powers to make objects move | .85 | | | | | | | | | | | | | .86 | | | | |
| R-PBS 69 Some individuals are able to levitate (lift) objects through mental forces | .82 | | | | | | | | | | | | | .80 | | | | |
| R-PBS 46 Psychokinesis, the movement of objects through psychic powers, does exist | .65 | | | | | | | | | | | | | .77 | | | | |
| ASGS 101 I believe in the existence of psychokinesis, that is, the direct influence of mind on a physical system, without the mediation of any known physical energy | .75 | | | | | | | | | | | | | .70 | | | | |
| Factor 8: Astrology | | | | | | | | | | | | | | | | | | |
| R-PBS 93 The horoscope accurately tells a person's future | .72 | | | | | | | | | | | | | .85 | | | | |
| MMU 40 Horoscopes prepared by properly qualified experts for individual people can accurately predict the future | .77 | | | | | | | | | | | | | .82 | | | | |
| R-PBS 48 Astrology is a way to accurately predict the future | .73 | | | | | | | | | | | | | .80 | | | | |
| PSI 10 Contrary to scientific opinion, there is some validity in fortune telling | .70 | | | | | | | | | | | | | .66 | | | | |
| PSI 19 It is quite possible for planetary forces to control personality traits | .54 | | | | | | | | | | | | | .64 | | | | |
| PSI 2 In spite of what people think, card reading, for example, tarot cards, can tell a lot about a person and their future | .68 | | | | | | | | | | | | | .63 | | | | |
| PSI 26 As a general rule, a fortune teller's predictions which come true are the result of coincidence | .55 | | | | | | | | | | | | | .58 | | | | |
| R-PBS 14 Witches do exist | .77 | | | | | | | | | | | | | .87 | | | | |
| R-PBS 5 There are actual cases of witchcraft | .79 | | | | | | | | | | | | | .82 | | | | |
| R-PBS 105 Black magic really exists | .77 | | | | | | | | | | | | | .63 | | | | |

Additional, Newly Formed Item; ASGS, Australian Sheep-Goat Scale; Chequers, Extraterrestrial Life & UFO Related Scale of Paranormal Belief; MMU, Manchester Metropolitan University Scale of Paranormal Belief; PSI, Paranormal Short Inventory; R-PBS, Revised Paranormal Belief Scale; Wiseman, Superstition Scale

Factor 1 (hauntings and communication with the dead), eigenvalue of 21.27, accounted for 36.06% of the variance. This factor demonstrated excellent internal reliability ($\alpha = .96$). The eight items this factor comprised included: four additional items, two items from the MMU Scale (Foster, 2001), one item from the spiritualism subscale of the R-PBS (Tobacyk & Milford, 1983, Tobacyk, 1988, Lange, Irwin, & Houran, 2000), one item from the PSI (Randall, 1997).

Factor 2 (existence of life on other planets), eigenvalue of 5.83, accounted for 9.89% of the variance. This factor demonstrated excellent internal reliability ($\alpha = .91$). The six items this factor comprised included: three additional items, two items from the MMU Paranormal Belief Scale (Foster, 2001), and a single item from the Extraordinary Life Forms subscale of the R-PBS (Tobacyk & Milford, 1983, Tobacyk, 1988, Lange, Irwin, & Houran, 2000).

Factor 3 (superstition), eigenvalue of 3.42, accounted for 5.80% of the variance. This factor demonstrated excellent internal reliability ($\alpha = .90$). The factor comprised seven items: five items from Wiseman and Watt (2004), and two from the Superstition subscale of the R-PBS (Lange, Irwin, & Houran, 2000, Tobacyk, 1988, Tobacyk & Milford, 1983).

Factor 4 (religious belief and belief in life after death), eigenvalue of 2.92, accounted for 4.97% of the variance. This factor demonstrated excellent internal reliability ($\alpha = .91$). The factor comprised six items: Three of these items originated from the Traditional Religious Beliefs subscale of the R-PBS (Tobacyk & Milford, 1983, Tobacyk, 1988, Lange, Irwin, & Houran, 2000), two from the MMU Paranormal Belief Scale (Foster, 2001), and one from the ASGS (Thalbourne & Delin, 1993).

Factor 5 (extraterrestrial visitations to earth including aliens landing on earth and abducting human beings), eigenvalue of 2.46, accounted for 4.18% of the variance. This factor demonstrated excellent internal reliability ($\alpha = .95$). The factor comprised eight items: six additional items, one from the Extraterrestrial Life and UFO Related Beliefs Scale (Chequers, Joseph, & Diduca, 1997), and one from the MMU Paranormal Belief Scale (Foster, 2001).

Factor 6 (extrasensory perception including both telepathy and precognition), eigenvalue of 1.84, accounted for 3.11% of the variance. This factor demonstrated excellent internal reliability ($\alpha = .89$). The factor comprised seven items: five from the ASGS (Thalbourne & Delin, 1993) and two from the MMU Paranormal Belief Scale (Foster, 2001).

Factor 7 (psychokinesis), eigenvalue of 1.55, accounted for 2.63% of the variance. This factor demonstrated excellent internal reliability ($\alpha = .93$). The

factor comprised six items: three from the psi subscale of the R-PBS (Lange, Irwin, & Houran, 2000, Tobacyk, 1988, Tobacyk & Milford, 1983), one from the PSI (Randall, 1997), one from the ASGS (Thalbourne & Delin, 1993), and one from the MMU Paranormal Belief Scale (Foster, 2001).

Factor 8 (fortune telling, including horoscopes, astrology, and tarot cards), eigenvalue of 1.43, accounted for 2.42% of the variance. This factor demonstrated excellent internal reliability ($\alpha = .91$). The factor comprised seven items: four from the PSI (Randall, 1997), two from the R-PBS (Lange, Irwin, & Houran, 2000, Tobacyk, 1988, Tobacyk & Milford, 1983), and one from the MMU Paranormal Belief Scale (Foster, 2001).

The final factor, **Factor 9 (witchcraft)**, eigenvalue of 1.22, accounted for 2.07% of the variance. The factor demonstrated good internal reliability ($\alpha = .84$). This factor comprised the three items from the R-PBS (Lange, Irwin, & Houran, 2000, Tobacyk, 1988, Tobacyk & Milford, 1983).

Correlations among the nine factors are shown in Table 3. The majority of the correlations can be seen to be moderate to high, with values commonly ranging between .4 and .7, which suggests a single paranormal belief factor underpinned by eight related paranormal belief subscales. Only one factor, belief in the presence of life on other planets, was not closely related to the others. Correlations between this factor and the others ranged between $-.03$ and $.20$, with the exception of alien visitation: A moderate positive correlation was found between other life and alien visitation, $.47$.

TABLE 3
Inter Factor Correlations

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---------------------|---|------|------|------|------|------|------|------|------|
| 1. Hauntings | | .17* | .41* | .57* | .52* | .65* | .66* | .71* | .60* |
| 2. Other Life | | | -.03 | .02 | .47* | .17* | .20* | .12* | .16* |
| 3. Superstition | | | | .27* | .22* | .34* | .29* | .47* | .23* |
| 4. Religious Belief | | | | | .29* | .45* | .35* | .42* | .41* |
| 5. Alien Visitation | | | | | | .46* | .59* | .46* | .41* |
| 6. ESP | | | | | | | .64* | .65* | .52* |
| 7. PK | | | | | | | | .64* | .57* |
| 8. Astrology | | | | | | | | | .53* |
| 9. Witchcraft | | | | | | | | | |

*Correlations significant at $p \leq .001$.

Discussion

The composite measure of paranormal belief (R-PBS, ASGS, PSI, MMU Paranormal Belief Scale, etc.) used in the current study was found to be reducible to nine factors: Hauntings, Other Life, Superstition, Religious Belief, Alien Visitation, ESP, PK, Astrology, and Witchcraft. Examination of each factor suggested that item clusters were conceptually coherent; factors possessed good face validity being composed of individual items that were clearly related to the assigned factor label. Additionally, each emergent factor demonstrated good internal reliability.

Eight of the factors were found to have moderate to high degrees of intercorrelation, representing general belief in the paranormal. The remaining factor, belief in the existence of life on other planets, demonstrated only weak associations with the other factors, and thus was not considered to be a core element of paranormal belief. These findings provide some support for the observation of Chequers, Joseph, and Diduca (1997) that UFO-related beliefs function differently from belief in extraterrestrial life; they found only the former to be positively associated with scores on the multidimensional schizotypy questionnaire (Rawlings & MacFarlane, 1994).

The finding that alien visitation represents a discernible factor supports the work of Diaz-Vilela and Alvarez-Gonzalez (2004). However, Diaz-Vilela and Alvarez-Gonzalez found belief in alien visitation and existence of extraterrestrial life to constitute a single factor, while the results of the present study suggest that these belief clusters may constitute two correlated but separate factors; belief in alien visitation is more highly associated with paranormal belief than belief in other life forms. Further confirmatory factor analysis will be required to determine how these factors can be best presented as a model of overall paranormal belief.

The present study suggests that a broader measure of paranormal belief is required. Additional factors to those included in established measures, such as the R-PBS, have been identified. A new measure developed in line with these belief clusters would have the advantage of assessing under-researched paranormal-related beliefs (hauntings and alien visitation) alongside more traditional facets of paranormal belief (ESP, PK, etc.). Although it can be argued that alien/UFO-related beliefs are not paranormal, belief in alien activity and abduction share many of the features of paranormal beliefs. Particularly, such beliefs are unconventional, run contrary to existing scientific evidence, and are not supported by prevailing scientific knowledge. These are attributes shared with traditionally labelled paranormal beliefs, and thus make alien/UFO beliefs worthy of inclusion (Lawrence, 1995). It is hoped that using these newly proposed dimensions, we can determine whether alien/

UFO-related beliefs are explained by the same psychological mechanisms as traditional paranormal beliefs.

Finally, the results of the current study provide support for the notion that religious and paranormal beliefs are related. However, whereas the R-PBS identifies religious belief as a single subscale underlying paranormal belief, the current study proposes that religious belief forms a common factor with belief in life after death. This makes both intuitive and theoretical sense; indeed, Irwin (1999) identifies the survival hypothesis as one of the core domains of parapsychology.

In conclusion, it is considered that the approach adopted in the present study, combining several extant measures of paranormal belief and supplementing these with additional items (where omissions were identified), has produced a potential structure for a revised measure of paranormal belief. Future research is intended to refine the scale items into a concise and easy-to-administer questionnaire measure of paranormal belief.

References

- Bainbridge, W. S., & Stark, R. (1980). Superstitions: Old and new. *Skeptical Inquirer*, 4, 18–31.
- Bartlett, M. S. (1954). A note on the multiplying factors for various chi-square approximations. *Journal of the Royal Statistical Society*, 16(Series B), 296–298.
- Blackmore, S. J., & Troscianko, T. (1985). Belief in the paranormal: Probability judgements, illusory control, and the chance baseline shift. *British Journal of Psychology*, 76, 459–468.
- Carlotto, M. J. (1997). Evidence in support of the hypothesis that certain objects on Mars are artificial in origin. *Journal of Scientific Exploration*, 11, 1–13.
- Carlotto, M. J. (2002). *The Cydonia Controversy. The History, Science, and Implications of the Discovery of Artificial Structures on Mars*. 1stBooks Library.
- Chequers, J., Joseph, S., & Diduca, D. (1997). Belief in extraterrestrial life, UFO-related beliefs, and schizotypal personality. *Personality and Individual Differences*, 23, 519–521.
- Comrey, A. L., & Lee, H. B. (1992). *A First Course in Factor Analysis* (second edition). Hillsdale, NY: Erlbaum.
- Crater, H. W., & McDaniel, S. V. (1999). Mound configurations on the Martian Cydonia plain. *Journal of Scientific Exploration*, 13, 373–396.
- Dagnall, N., Parker, A., & Munley, G. (2007). Superstitious belief: Negative and positive superstitions. *European Journal of Parapsychology*, 22, 122–137.
- Davis, G. A., Peterson, J. M., & Farley, F. H. (1974). Attitudes, motivation, sensation seeking, and belief in ESP as predictors of real creative behavior. *Journal of Creative Behavior*, 8, 31–39.
- Diaz-Vilela, L., & Alvarez-Gonzalez, C. (2004). Differences in paranormal beliefs across fields of study from a Spanish adaptation of Tobacyk's R-PBS. *Journal of Parapsychology*, 68, 405–421.
- DiPietro, V., Molenaar, G., & Brandenburg, J. (1988). *Unusual Mars Surface Features* (fourth edition). Glenn Dale, MD: Mars Research.

- Emmons, C. F., & Sobal, J. (1981). Paranormal beliefs: Functional alternatives to mainstream religion. *Review of Religious Research*, 22, 301–312.
- Friedman, S. T. (2008). *Flying Saucers and Science: A Scientist Investigates the Mysteries of UFOs*. Career Press.
- Foster, J. J. (2001). *Measuring belief in parapsychological phenomena and its relationship with paranormal experience and religious attitude*. Unpublished manuscript.
- Goode, E. (2000). Two paranormals or two and a half? An empirical exploration. *Skeptical Inquirer*, 24, 29–35.
- Goode, E. (2002). Education, scientific knowledge, and belief in the paranormal. *Skeptical Inquirer*, 26(1), 24–27.
- Goulding, A., & Parker, A. (2001). Finding psi in the paranormal: Psychometric measures used in research in paranormal beliefs/experiences and in research on psi-ability. *European Journal of Parapsychology*, 16, 73–101.
- Haraldsson, E. (1981). Some determinants of belief in psychical phenomena. *Journal of the American Society for Psychical Research*, 75, 297–309.
- Houran, J., & Lange, R. (2001). Support for the construct validity of the two-factor conceptualisation of paranormal belief: A complement to Thalbourne. *European Journal of Parapsychology*, 16, 53–61.
- Houran, J., & Thalbourne, M. A. (2001a). Further study and speculation on the psychology of “entity encounter experiences.” *Journal of the Society for Psychical Research*, 65, 26–37.
- Houran, J., & Thalbourne, M. A. (2001b). Theoretical refinements on entity encounter experiences and transliminality. *Journal of the Society for Psychical Research*, 65, 241–256.
- Irwin, H. J. (1985). A study of the measurement and the correlates of paranormal belief. *Journal of the American Society for Psychical Research*, 79, 301–326.
- Irwin, H. J. (1999). *An Introduction to Parapsychology* (third edition). Jefferson, NC: McFarland.
- Irwin, H. J. (2003). Reality testing and the formation of paranormal beliefs. *European Journal of Parapsychology*, 18, 15–28.
- Irwin, H. J., & Watt, C. (2006). *An Introduction to Parapsychology* (fifth edition). Jefferson, NC: McFarland.
- Jones, W. H., Russell, D., & Nickel, T. (1977). Belief in the paranormal scales: An objective instrument to measure belief in magical phenomena and causes. *JSAS Catalog of Selected Documents in Psychology*, 7, 100.
- Kaiser, H. F. (1970). A second generation Little Jiffy. *Psychometrika*, 35, 401–415.
- Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, 39, 31–36.
- Kumar, V. K., & Pekala, R. J. (2001). Relation of hypnosis-specific attitudes and behaviours to paranormal beliefs and experiences: A technical review. In: *Hauntings and Poltergeists: Multidisciplinary Perspectives* edited by J. Houran & R. Lange. Jefferson, NC: McFarland.
- Kumar, V. K., Pekala, R. J., & Gallagher, C. (1994). The anomalous experiences inventory. [Unpublished psychological test]. West Chester, PA: West Chester University.
- Lange, R., Irwin, H. J., & Houran, J. (2000). Top-down purification of Tobacyk’s Revised Paranormal Belief Scale. *Personality and Individual Differences*, 29, 131–156.
- Lange, R., & Thalbourne, M. A. (2002). Rasch scaling paranormal belief and experience: Structure and semantics of Thalbourne’s Australian Sheep–Goat Scale. *Psychological Reports*, 91, 1065–1073.

- Lawrence, T. R. (1995). How many factors of paranormal belief are there?—A critique of the paranormal belief scale. *Journal of Parapsychology*, *59*, 3–25.
- McGarry, J. J., & Newberry, B. H. (1981). Beliefs in paranormal phenomena and locus of control: A field study. *Journal of Personality and Social Psychology*, *41*, 725–736.
- Murphy, K., & Lester, D. (1976). A search for correlates of belief in ESP. *Psychological Reports*, *38*, 82.
- O’Leary, B. (1990). Analysis of images of the face on Mars and possible intelligent origin. *Journal of the British Interplanetary Society*, *43*, 203–208.
- Orestein, A. (2002). Religion and paranormal belief. *Journal for the Scientific Study of Religion*, *41*, 301–311.
- Otis, L. P., & Alcock, J. E. (1982). Factors affecting extraordinary belief. *Journal of Social Psychology*, *118*, 77–85.
- Randall, T. M. (1997). Paranormal short inventory. *Perceptual and Motor Skills*, *84*, 1265–1266.
- Randall, T. M., & Desrosiers, M. (1980). Measurement of supernatural belief: Sex differences and locus of control. *Journal of Personality Assessment*, *44*, 493–498.
- Rawlings, D., & MacFarlane, C. (1994). A multidimensional schizotypal traits questionnaire for young adolescents. *Personality and Individual Differences*, *17*, 489–496.
- Sitchin, Z. (1976). *The 12th Planet*. New York: Avon Books.
- Thalbourne, M. A. (1995a). Further studies of the measurement and correlates of belief in the paranormal. *Journal of the American Society for Psychical Research*, *89*, 233–247.
- Thalbourne, M. A. (1995b). Psychological characteristics of believers in the paranormal: A replicative study. *Journal of the American Society for Psychical Research*, *89*, 153–164.
- Thalbourne, M. A. (2001). Measures of the sheep–goat variable, transluminality, and their correlates. *Psychological Reports*, *88*, 339–350.
- Thalbourne, M. A., & Delin, P. S. (1993). A new instrument for measuring the sheep–goat variable: Its psychometric properties and factor structure. *Journal of the Society for Psychical Research*, *59*, 172–186.
- Thalbourne, M. A., Dunbar, K. A., & Delin, P. S. (1995). An investigation into correlates of belief in the paranormal. *Journal of the American Society for Psychical Research*, *89*, 215–231.
- Thalbourne, M. A., & O’Brien, R. (1999). Belief in the paranormal and religious variables. *Journal of the Society for Psychical Research*, *63*, 110–122.
- Tobacyk, J. (1988). *A Revised Paranormal Belief Scale*. [Unpublished manuscript].
- Tobacyk, J. (1995a). Final thoughts on issues in the measurement of paranormal beliefs. *The Journal of Parapsychology*, *59*, 141–145.
- Tobacyk, J. (1995b). What is the correct dimensionality of paranormal beliefs?: A reply to Lawrence’s critique of the paranormal. *The Journal of Parapsychology*, *59*, 27–46.
- Tobacyk, J. (2004). A revised paranormal belief scale. *The International Journal of Transpersonal Studies*, *23*, 94–99.
- Tobacyk, J., & Milford, G. (1983). Belief in paranormal phenomena—Assessment instrument development and implications for personality functioning. *Journal of Personality and Social Psychology*, *44*, 1029–1037.
- Tobacyk, J., & Wilkinson, L. V. (1990). Magical thinking and paranormal beliefs. *Journal of Social Behavior and Personality*, *5*, 255–264.
- Wilson, G. D. (1975). *Manual for the Wilson–Patterson Attitude Inventory*. Windsor: NFER Publications.

- Windholtz, G., & Diamant, L. (1974). Some personality traits of believers in extraordinary phenomena. *Bulletin of the Psychonomic Society*, 3, 125–126.
- Wiseman, R., & Watt, C. (2004). Measuring superstitious belief: Why lucky charms matter. *Personality and Individual Differences*, 37, 1533–1541.
- Wiseman, R. & Watt, C. (2006). Belief in psychic ability and the misattribution hypothesis: A qualitative review. *British Journal of Psychology*, 97, 323–338.