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The Relationship between Paranormal Belief and the HEXACO Domains of Personality

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The relationship between paranormal belief and the HEXACO domains of personality: an individual differences approach

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Abstract

The HEXACO-PI-R (Ashton & Lee, 2007) has been presented as an alternative measure of the Five Factor Model, with the inclusion of the dimension of honesty/humility. This new measure of personality was utilised alongside the Revised Paranormal Belief Scale (RPBS) in a correlational design among 137 undergraduate students in Wales. Multiple regression analysis demonstrated that superstition was significantly negatively correlated with conscientiousness and openness to experience, while precognition was significantly negatively correlated with honesty/humility. No other personality factors were statistically significant predictors of any dimensions of paranormal belief. While these results do not provide strong support for previous findings, it is concluded that the inclusion of the honesty/humility dimension renders the HEXACO-PI-R a useful measure for considering relationships between personality and paranormal belief.

Introduction

Costa and McCrae's (1992) trait model proposes that an individual's personality can be assessed along five orthogonal factors. In developing the Five Factor Model of personality, Costa and McCrae (1992) provide discrete characterisations for each of the fators. Extraversion is described as encompassing traits such as being talkative, energetic and assertive. This trait measures cheerfulness, initiative and communication. Those who score highly on extraversion are perceived to be sociable, warm and affectionate; further they are more likely to enjoy large crowds of people. Conversely, those with low scores are introverted and reserved and prefer a slow and steady pace. Agreeableness is described as including the traits of being sympathetic, kind and affectionate. Those who score highly on agreeableness are perceived to be friendly, empathic, and warm. Conversely, those who record low scores on agreeableness are shy, suspicious and egocentric. Conscientiousness considers traits such as organisation and thoroughness. Those who record high scores on conscientiousness tend to be motivated, disciplined, and trustworthy. Conversely, those who record low scores tend to be easily distracted and irresponsible. Neuroticism covers the traits of being moody, tense and anxious. Individuals who record high scores on neuroticism can be characterised as being apprehensive and less self-assured, and will often have poor self-control. Conversely, those who record low scores can be characterised as being calm, confident and content. Openness considers traits of having wide interests, being imaginative, and being insightful. Those who record high scores in openness can be characterised as being creative, and being open to new experiences beyond the normally perceived acceptable boundaries. Conversely, those who record low scores in openness can be characterised as having a preference for routines, having strong values, and being formed by rigid notions of reality (McCrae & John, 1992; McCrae, 2002). To date, this model of personality has been utilised within many areas of psychology including occupational psychology (Barrett, 1992;

Black, 2000; Zhao & Seibert, 2006), social psychology (Malouff, Thorsteinsson, Schutte; Bhullar, & Rooke, 2010; Ryan & Xenos, 2011; Lundberg, 2012), health psychology (Kornør & Nordvik 2007), and clinical psychology (Kendler & Myers, 2010; Cain; 2012).

Despite its extensive utilisation, the Five Factor Model of Personality has received criticism with regards to the measurement and the theoretical adequacy. The first critique is concerned with the number of factors actually accounted for within the measure; some commentators argue that seven factors are present (Moshe, Tellegen, & Niels, 1995; Church, Katigbak, & Reyes 1998), while others argue that there is only one factor, the so-called 'Big One' (Musek, 2007). The second critique stems from the psychology of survey response, with the concern that the Costa and McCrae (1992) measure requires too much effort on behalf of the participant. For example, Gosling, Rentfrow and Swan (2003) developed and carried out a study to review two new measures of the Five Factor Model that were designed specifically to reduce the time taken to complete the survey. They found that a 10-item measure was psychometrically superior to a 5-item measure, yet research has demonstrated the comparative psychometric weakness of the Ten Item Personality Index in comparison to the full measure of the Costa and McCrae (1992) model (Williams, Marsh, Spector, & Harris, in press) that suggests the measure should be used with caution.

Given the above critiques of the Five Factor Model of personality, Lee and Ashton (2004a) proposed a new model of personality named the HEXACO-PI-R, a revised version of the earlier HEXACO scale in which refinements were made to the extraversion scale. Ashton and Lee (2007) suggest that personality is better described as a six factor theory with factors including Honesty/Humility, Emotionality (equivalent to neuroticism), Extraversion, Agreeableness, Conscientiousness, and Openness to Experience. Initial validation of the model demonstrated high levels of internal consistency of the individual traits, alongside strong factor loadings after oblique rotation. Lee and Ashton (2004a; 2012) have provided

further tests of internal consistency reliability of this scale with the additional measure of honesty/humility, at both the subscale and facet level, across a number of different samples. It is the contention of Lee and Ashton (2004a) that Honesty/Humility be added as an independent factor to the Five Factor model as a measure of an individual's level of sincerity, fairness, greed avoidance and modesty, dimensions of personality that are not embedded in or measured by any other trait on the Five Factor model (Wakabayashi, 2014).

Since the development of the HEXACO scale a number of studies have been conducted which draw out the weaknesses of the model. Lee, Ogunfowora, and Ashton (2005) confirm the relatedness of the HEXACO model with other similar measures, but note that with high levels of factorial saturation of the honesty/humility model a facet-led approach should be taken in using the model. This argument has been called into question, especially when considering studies that focus on religion, given the potentiality for high levels of covariance between individual level facets and religious ideas (e.g. Silvia, Nusbaum, & Beaty, 2014). A further critique of the HEXACO is developed by Hough, Oswald and Ock (2015) who, while acknowledging the development of the HEXACO model as a conceptual improvement and development of the Five Factor Model, note that many key traits that have been evidenced in other literature (such as interpersonal skills, conventionality, and humouredness) are lacking from the current model. Similarly, Shepherd and Belicki (2008) argue that one of major limitations of the HEXACO model is the apparent absence of trait forgiveness within the honesty/humility domain. Shepherd and Belicki (2008) contend that while forgiveness can be seen implicitly within the HEXACO model, an additional trait should be added to the honesty/humility dimension to ensure the characteristics associated with this factor are captured fully.

Although these weaknesses have been identified, a number of studies have also demonstrated the value of the new six factor model. In relation to convergent and divergent

validity, Book, Visser and Volk (2015) note that the inclusion of the honesty/humility scale has enabled a better and fairer assessment of the dark triad (the personality traits of narcissism, Machiavellianism, and psychopathy) to be undertaken by providing items to which the majority of individuals are able to relate. Similarly, Lewis and Bates (2014) have argued that the development of the HEXACO model has enabled a further examination of the place of biology and genetics within personality formation. Drawing on the international TwinsUK database, Lewis and Bates (2014) were able to demonstrate that each subscale could be correlated by genetic co-variation, and thus the HEXACO model can support further the understanding of personality as being genetically based.

Alongside studies that examine the coherence of the model, a number of studies have been developed that test the correlational and predictive power of HEXACO. For example, Chirumbolo and Leone (2010) note that, among 517 undergraduate students, the domains of honesty/humility, agreeableness and openness were positively related to voting for left-wing parties, whereas conscientiousness was correlated with voting for right-wing parties. In relation to religiosity, the honesty/humility dimension includes facets such as modesty, greed avoidance and fairness which reflect teachings in traditional religions (Silvia, Kaufman, Reiter-Palmon, & Wigert, 2011; Silvia, Nusbaum, & Beaty 2014); indeed, Aghababaei (2012) has established, among a sample of 190 student volunteers from the University of Tehran, that honesty/humility is most strongly correlated to interest in religion and both intrinsic and extrinsic motivation. These findings are supported by the contention of Lee and Ashton (2004b) that low scores in honesty/humility can be related to the Dark Triad of psychopathy, Machiavellianism and narcissism, which have been demonstrated to be negatively correlated with traditional religiosity (Kammerle, Unterrainer, Dahmen-Wassenberg, Fink, & Kapfhammer, 2014; Stefa-Missagli, Huber, Fink, Sarlo, & Unterrainer,

2014). Given the arguments presented above, it can be assumed that the HEXACO-PI-R is a satisfactory tool for measuring personality, especially when examining religiosity.

Paranormal beliefs

One continuing area of exploration for psychologists of religion concerns the prevalence of belief in contemporary society (Argyle, 1999; Hood & Hill, 2009), which has, to date, been mainly focused on traditional Christian belief (Francis, Lewis, Philipchalk, Brown, & Lester, 1995; Francis, Croft, Pyke, & Robbins, 2012). However, within the United Kingdom, at least, there has been a general decline in affiliation to traditional religions (especially Christianity) and an increase of affiliation to spirituality (Houtman & Aupers, 2007; Voas, 2007; Bass, 2012; and Davie, 2015) which has led to a re-evaluation of the place, role and correlates of religious and spiritual beliefs.

Exploring the move away from religion in greater detail, Heelas and Woodhead (2004, p. 5) have suggested that the traditional religion (Christianity) is giving way to, or becoming less popular in light of, the "holistic milieu". As Partridge (2004; 2015) has noted, there is within the United Kingdom a re-emergence of occult traditions that better serve an individual's need for a subjective religion which is able to give a more rounded account of paranormal and esoteric experiences. Partridge (2015) goes on to argue that the dogmatic teachings of the Christian church have subdued and suppressed an innate interest in the esoteric that many individuals possess. This need for a more holistic view of religion, it is argued, has led to an increased interest in the New Age, in non-traditional paranormal beliefs, and in new forms of religious expression (cf. Berger & Ezzy, 2007; Schofield-Clark, 2003; Smith with Denton, 2005).

This sociological concern with the paranormal has also been reflected in psychological investigations, such as those examining the propensity and correlates of

paranormal belief (Irwin, 2009; Holt, Simmonds-Moore, Luke, & French, 2012; French & Stone, 2013). One of the major difficulties faced by those researching the prevalence of paranormal belief concerns the way in which this construct is both conceptualised and operationalized. From a theoretical perspective it has long been argued that greater clarity is needed when referring to paranormal phenomena within questionnaires. Rice (2003) highlights that greater clarity is needed in reference to paranormal beliefs, and notes how early studies on the subject adopt, and confuse, two very different meanings of paranormal beliefs. The first meaning, Rice argues, can be referred to as classic paranormal beliefs (for example, *déjà vu*, extra-sensory perception, extraterrestrials, and psychic healing) that encompass paranormal beliefs and experiences that go beyond contemporary religious ideas, and seemingly transcend scientific understandings of physics. The second meaning, Rice argues, can be referred to as religious paranormal beliefs (for example, belief in the devil, angels, heaven, hell, and life after death) and encompass paranormal beliefs and experiences that sit within the framework of theology and religious experience. Rice argues that it is inherently ambiguous to combine classic paranormal beliefs with religious paranormal beliefs when a researcher is trying to research paranormal belief in its purest form.

Following on from Rice's ideas, Mathijsen (2009) argues that the study of paranormal belief often fails to take into account the full nature of the individual involved in that debate. Mathijsen (2009) argues that there needs to be a refocusing on the individual in order to ascertain the extent to which paranormal beliefs influence the life of a person. One way to do this could be through exploring the antecedents, correlates and consequences of personality in relation to paranormal beliefs in order to gain a richer picture of the way in which an individual both approaches and adopts paranormal beliefs.

Lindeman and Svedholm (2012) follow Rice's line of argument to suggest that current research within parapsychology gives little epistemological distinction to terms such as

paranormal, superstition, magic and the supernatural. Their systematic review of literature suggested that often scholars would not make the distinction between the underlying principles of belief in psi and superstitious belief, despite the underlying differences in these two beliefs. Lindeman and Svedholm (2012) call for researchers to conceptualise and operationalize the construct of paranormal more clearly, and with greater rigour, in order to develop a nuanced understanding of the different elements of paranormal belief; however, it is noted by Lindeman and Svedholm (2012) that operationalizing such distinct, but connected, concepts can be problematic.

One way in which this could be done is through utilising the Revised Paranormal Belief Scale (RPBS; Tobacyk, 1988; 2004). The RPBS provides a 26-item scale that measures paranormal belief on seven orthogonal subscales: traditional religious belief, psi (paranormal and anomalous experiences such as telekinesis), witchcraft, superstition, spiritualism, extraordinary life forms, and precognition (the perception of information about future places or events before they occur). Tobacyk's conceptualisations of paranormal belief were driven by the understanding that paranormal phenomena are those that violate the basic principles of Western science (Tobacyk, 2004). As such, the Tobacyk paranormal belief scale has been revised from its original 26-items (Tobacyk & Milford, 1983), to 25-items (Tobacyk, 1988), back to 26-items (Tobacyk, 2004) that reflected changes in understandings of paranormal phenomena (especially regarding precognition and extraordinary life-forms).

The seven distinct areas of Tobacyk's paranormal belief scale have been subject to both critique and support by a number of studies. The main critique concerns the number of distinct factors that can be extracted from the available items. Hartmann (1999) and Lawrence (1995) argued that only four factors were present, although Lawrence and Decicco (1997) subsequently revised this to five factors, arguing that the subscales of extraordinary

life forms and precognition should be removed or revised. In a reply to Lawrence (1995), Tobacyk (1995) agrees that the RPBS provides some theoretically challenging notions to parapsychology (for example, regarding whether belief in extraordinary life forms should be considered as paranormal), but defends the seven factor structure as combining both related and unrelated conceptualisation of a broad area. As such the RPBS has been used extensively in research concerned with areas such as dissociative experiences (Wolfradt, 1997), thinking styles (Aarnio & Lindeman, 2005), and schizotypy (Hergovich, Schott, & Arendasy, 2008).

 In support of the scales, Lange, Irwin and Houran (2000) confirm the seven areas proposed by Tobacyk (1988) but argue that the subscales are subject to significant gender and age biases that should be accounted for in future studies. Williams, Francis, and Lewis (2009) supported the use of the RPBS that distinguished between classic paranormal beliefs and religious paranormal beliefs. Concluding their study, Williams, Francis and Lewis (2009) argued that while the RPBS remains an appropriate scale for measuring paranormal belief, it should be used with the distinctions present between the seven subscales to provide a fully nuanced understanding of these phenomena.

Personality and paranormal beliefs

Harvey (2009) argues that the current focus of personality and paranormal beliefs falls into two main schools of thought directly influenced by the construct of personality used. The first school of thought relies on Eysenck's dimensional model of personality (and has been addressed elsewhere, cf Williams, Francis, & Robbins, 2007), while the second school relies on the Five Factor model of personality most associated with Costa and McCrae (1992).

Research within the second school of studies demonstrates two main (and conflicting) findings. First, studies have demonstrated that there is no relationship between paranormal

beliefs and the Five Factor Model. For example, Laher and Quy (2009) demonstrated that no relationship was present between beliefs of spiritualism and the Five Factor Model among undergraduate students in South Africa.

The second group of studies within the Five Factor Model tradition has established a relationship between paranormal beliefs and aspects of the model. For example, Zingrone, Alvarado and Dalton (1998) demonstrated that psi experiences were correlated positively with openness but negatively with conscientiousness.   The authors concluded that having a cognitive openness to experience is seemingly an important factor within paranormal belief, while those who record lower levels of conscientiousness are more likely to be accepting of ambiguity and therefore unlikely to engage cognitive processes to ascertain the reason of such ambiguity.

Lindeman and Aarnio (2006) explored the relationship between emotional instability, as operationalized by the neuroticism scale of the Five Factor Model, and paranormal beliefs as measured by the Tobacyk Revised Paranormal Belief Scale (2004) and newly created items assessing belief in lunar effects. The results from 3,261 undergraduate students demonstrated that neuroticism was positively related to magico-religious beliefs (witchcraft, astrology, traditional religious beliefs), to beliefs in agents (Spiritualism, psi and precognition) and signs (belief in the power of amulets, rituals and luck). These results suggest that those participants who demonstrated higher levels of emotional instability were also more likely to attest belief in paranormal phenomena. These results were consolidated by Aarnio and Lindeman (2007) in their further analysis of the same sample in which it was demonstrated that believers in paranormal phenomena recorded higher mean scores on neuroticism when compared with sceptical individuals and traditionally religious individuals. The weight of these results confirm the assumption that individuals who recorded higher levels of neuroticism are more open to external influences that may control, protect and

support their lives (such as amulets), and more open to beliefs that can help guard against unknown future possibilities (such as astrology) in order reduce the negative traits associated with high levels of neuroticism.

Smith, Johnson and Hathaway (2009) utilised responses from 135 volunteers in America to explore the relationship between belief in paranormal phenomena, openness to experiences and sensation seeking. The results demonstrated that there was a moderate positive correlation between belief in paranormal phenomena and openness to experience, and also a moderate positive correlation between belief in paranormal phenomena and sensation seeking. The authors conclude that these two personality dimensions fit well with belief in paranormal phenomena as they indicate individuals who are open to new ideas and are less likely to hold rigid belief systems while also being more accepting of unusual beliefs.

Milas, Mlacic, and Miklousic (2012) explored the relationship between the Five Factor Model of personality and paranormal beliefs among a sample of 307 undergraduates in Croatia. The results demonstrated that conscientiousness was positively correlated with traditional religious belief, but negatively correlated with belief in psi. Further, neuroticism was positively correlated with belief in superstition, belief in extraordinary life forms, and belief in precognition. Finally, openness was negatively correlated with traditional religious belief, but positively correlated with belief in psi and belief in spiritualism. The authors conclude that these results go some way to demonstrate that paranormal beliefs are associated with more maladaptive aspects of personality. These results are also supported by Browne, Pennycook, Goodwin, and McHenry (2014) in their study of 1,093 adults with a mean age of 55 years. The results from this study demonstrated that religious paranormal beliefs were positively correlated with conscientiousness, and negatively correlated with a need for cognitive closure. These findings would also support the argument that among those who accept paranormal phenomena there is a higher tolerance of ambiguity.

To date, a smaller number of studies have been carried out that utilise the HEXACO model with paranormal belief. Widiger (2010) explored the relationship between paranormal beliefs and openness among an undisclosed number of undergraduate students in America. The results demonstrated that openness to experience was positively correlated to paranormal beliefs. Against this background, therefore, the aim of the current study was to further explore the relationship between paranormal belief and the HEXACO model of personality. The utilisation of the Tobacyk Revised Paranormal belief scale allows comparisons to be made across all seven factors as suggested by Williams, Francis and Lewis (2009), while the utilisation of the HEXACO allows this area of study to advance by the inclusion of the Honesty/Humility factor to provide a more comprehensive model of personality. It was hypothesised that, based on the most consistent findings from previous research, the RPBS subscales of paranormal belief would be positively correlated with openness to experience and emotionality (as a similar construct to neuroticism), and negatively correlated with conscientiousness as operationalized by the HEXACO; the only exception was anticipated to be the traditional religious belief subscale, which was expected to be positively correlated with conscientiousness and honesty/humility.

Methods

Design

A correlational design was utilised through the use of an online survey. The survey consisted of the HEXACO-PI-R, the six dimensions of which were used as the predictor variables, and the Tobacyk Revised Paranormal Belief Scale, the seven subscales of which were used as the outcome variables.

Participants

A convenience sample of students studying at a University in North Wales were invited to take part in an online survey. In total 137 participants completed the questionnaire fully and were included in the final analysis. Of this sample, 14% (N=20) were male and 86% (N=117) were female which is representative of the population from which the sample was derived. With respect to age, the mean age was 27.2 (SD 7.0), ranging from 18 to 59 years. With reference to religion, nearly half of the sample (46.8%) stated they had no religious affiliation, while 45.2% claimed a Christian affiliation and the remaining 8% of the sample claimed affiliation to Hinduism, Judaism, Islam and 'other unspecified'.

Materials

Alongside demographic questions such as age, gender and religious affiliation, two scales were presented within the questionnaire.

Paranormal Belief was measured using the Tobacyk Revised Paranormal Belief Scale (Tobacyk, 2004). This 26-item measure operationalizes paranormal belief in seven areas: traditional religious beliefs, psi-phenomena, cases of witchcraft, belief in superstitions, belief in spiritualism, belief in extraordinary life forms, and belief in precognition. Each item is assessed on a five-point Likert-type scale: agree strongly, agree, not certain, disagree, and disagree strongly. Higher scores in this scale indicate a more accepting view of paranormal phenomena. Previous research has displayed satisfactory levels of reliability (Dag, 1999; Lindeman & Aarnio, 2007). The internal consistency reliability of this scale has been established by Williams, Francis and Lewis (2009) as follows: Traditional religious belief α = .83; psi α = .73; witchcraft α = .72; superstition α = .67; spiritualism α = .72; extraordinary life forms α = .49; precognition α = .66.

Personality was measured using the HEXACO-PI-R Scale (Lee & Ashton, 2004). This 100-item scale operationalizes personality in six dimensions: Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience. Each item is assessed on a five-point Likert-type scale: agree strongly, agree, not certain, disagree, and disagree strongly. Higher scores in this scale indicate a higher level of each personality dimension. Wakabayashi (2014) has established the internal consistency reliability as follows: Honesty/humility α = .88; emotionality α = .84, extraversion α = .90; agreeableness α =.88; conscientiousness α = .87; and openness α = .84. The current study made use of the 96-items that measure personality, and omitted the four items that measure altruism (Lee & Ashton, 2004a).

Results

Table one presents the descriptive statistics and internal consistency reliability scores for the Revised Paranormal Belief Scale (Tobacyk, 2004). In accordance with Kline (1999) and Field (2013) the overall scale achieved a satisfactory level of internal consistency reliability (α=.95). Further, the subscales present within the Revised Paranormal Belief Scale also achieved moderate to satisfactory levels of internal consistency reliability. As with previous research, extraordinary life forms recorded a lower level of internal consistency reliability (Williams, Francis, & Lewis, 2009).

With regards to the item endorsement (the percentage of those respondents who selected 'agree' and 'agree strongly' with the statements), it can be seen that overall there was not a high level of endorsement for the items. For example, around a third of the respondents agreed that there is life on other planets (34%); and that the soul continues to exist though the body may die (30%). Around a quarter of the participants agreed that 'some

people have an unexplained ability to predict the future' (27%); that some psychics can accurately predict the future (23%); that it is possible to communicate with the dead (22%); that they believe in God (20%); that reincarnation can occur (19%) and that mind reading is possible (18%). However, fewer respondents agreed some people are able to levitate objects (9%); that through the use of formulas and incantations it is possible to cast spells on persons (9%); that the number 13 is unlucky (7%); that the Loch Ness monster of Scotland exists (7%); and that astrology is a way to accurately predict the future (7%). Further, the percentage of endorsement was lower for the items: the horoscope accurately tells a person's future (6%); a person's thoughts can influence the movement of a physical object (5%); and the abominable snowman of Tibet exists (3%).

-Insert table 1 about here-

Table two presents the descriptive statistics and internal consistency reliability scores for the HEXACO-PI-R (Lee & Ashton, 2004). In line with Kline (1999) the subscales achieved satisfactory levels of internal consistency reliability: conscientiousness α= .77; honesty/humility α= .78; openness α= .81; agreeableness α= .81; emotionality α= .82; extraversion α= .86. Each subscale has a possible range of total scores from 16 to 80. With respect to mean scores, emotionality carried the highest mean (M=62.27, SD=8.27), followed by conscientiousness (M=52.57, SD=7.11), openness (M=52.49, SD=8.17), honesty/humility (M=50.93, SD=7.68), extraversion (M=49.38, SD=8.56) and agreeableness (M=46.39, SD=7.38).

-Insert table 2 about here-

Table three presents the Pearson Product Moment Correlations between the Revised Paranormal Belief subscales and the HEXACO-PI-R subscales. Two main points are worthy

of discussion from this table. First, with relation to demographic details it can be seen there was a moderate positive relationship between gender and emotionality (r=.40, p<.001) suggesting that women were more likely to record a higher level of emotionality; further there was a weak negative relationship between openness and gender (r=-.25, p=.05) suggesting that males were more likely to record a higher level of openness to experience.   In relation to age, there were weak positive statistically significant relationships with belief in psi (r=.27, p=.002), belief in witchcraft (r= .22, p=.013), and belief in spiritualism (r= .23, p=.010), suggesting a positive correlation between age and these subscales of paranormal belief.

-Insert table 3 about here-

The second point worthy of consideration relates to the correlations present between paranormal belief and the HEXACO-PI-R. From table three it can be seen that there are weak negative correlations between honesty/humility and belief in superstitions (r= -.19, p=.02) and precognition (r= -.23, p=.01).   Further, there are weak negative correlations between openness and superstition (r= -.29, p=.001) and precognition (r= -.22, p=.001). Finally, there was a weak negative correlation between conscientiousness and belief in superstitions (r= -.21, p=.01).

Table four presents the partial correlations in which gender and age were controlled, following the suggestion of Lange, Irwin and Houran (2000). From this table it can be demonstrated that when sex and age were controlled the negative relationships between honesty/humility and belief in superstitions (r= -.20, p=.030), and between honesty/humility and precognition (r= -.24, p=.008) were maintained. Further, a negative relationship was demonstrated between openness and belief in superstitions (r= -.25, p=.007) and between openness and belief in precognition (r= -.18, p=.05). After controlling for age and gender the correlation between conscientiousness and belief in superstitions was negated.

-Insert table 4 about here-

Table five presents the results of seven separate multiple linear regression analyses, one for each of the paranormal belief subscales as outcome variables, using the six personality domains as predictor variables in each case. These analyses demonstrated that the combination of the HEXACO personality domains significantly predicted belief in superstition ($R^2 = .13$, $F(6,130) = 3.49$, $p = .05$) and belief in precognition ($R^2 = .11$, $F(6,130) = 2.73$, $p = .05$). The analyses further demonstrated that there were significant negative relationships between superstition and both conscientiousness ($\beta = -.19$, p=.04) and openness ($\beta = -.22$, p=.01). There was also a significant negative relationship between precognition and honesty/humility ($\beta = -.25$, p=.006). No other statistically significant relationships were present between the paranormal subscales and the personality dimensions.

-Insert table 5 about here-

Discussion

The current study set out to investigate the relationship between paranormal belief, as measured by the Revised Paranormal Belief Scale (Tobacyk, 2004) and a relatively new measure of personality: the HEXACO-PI-R (Lee & Ashton, 2004). Based on previous literature that utilised the Five Factor Model of personality (Costa & McCrae, 1992), it was hypothesised that the RPBS subscales of paranormal belief would be positively correlated with emotionality and openness to experience, and negatively correlated with conscientiousness; the only exception was anticipated to be the traditional religious belief subscale, which was expected to be positively correlated with conscientiousness and

honesty/humility. On the basis of the results obtained, these hypotheses were not supported. Emerging from the results four main conclusions can be drawn.

The first conclusion concerns the utility of the HEXACO-PI-R measure of personality among a sample of undergraduate students. The individual subscales recorded satisfactory levels of internal consistency reliability, alongside correlations between the differing subscales. This demonstrates that the HEXACO-PI-R reliably measures personality, both in terms of internal consistency and construct reliability. As Lee and Ashton (2004) have demonstrated, this new measure of personality can be seen as a viable replacement for the Five Factor Model. Further, the inclusion of the honesty/humility subscale provides personality psychologists with a coherent and valuable measure of both positive and negative valency. Research is now needed to further explore the scale properties of the HEXACO-PI-R among different groups, and to extend the literature that places this personality scale against other measures. Despite the critiques of Block (2010) and Uher (2013) that the lexical approach to quantifying personality is out-dated, the current results suggest that these measures can be appropriately deployed among a student population.

The second conclusion concerns the propensity of paranormal beliefs among the sample. While previous research (Heelas & Woodhead, 2004; Partridge, 2015) has argued that as levels of traditional religious belief decrease, so levels of paranormal belief will increase, the current study demonstrates that adherence to paranormal belief is not well attested by the participants. While beliefs such as the existence of life on other planets were affirmed by over a third (34%) of the participants, other classic notions of paranormal belief were not well-endorsed – for example psi abilities and notions of precognition, these percentage endorsements being lower than those reported by Williams, Francis and Lewis (2009). Mathijsen (2009) and Lindeman and Svedholm (2012) have argued that what constitutes paranormal beliefs are complex and, as of yet, under-explored terms. As

Williams, Francis, and Lewis (2009) have argued, based on the work of Rice (2003), the Revised Paranormal Belief Scale (Tobacyk, 2004) offers an adequate view of paranormal belief if the subscales are considered separately rather than as a whole. Despite these limitations, it can be seen that, among this particular sample, there is relatively little endorsement for belief in either religious or classic paranormal phenomena. These findings would confirm the assumptions, among this sample of undergraduate students at least, of secularisation and the scientific revolution that have seen a movement away from reliance on supernatural factors to assimilate a worldview, to a more individualistically based construction of reality in which the need for an external locus of control (in the shape of a deity or other supernatural forces) is largely rejected (Williams, 2011).

Despite the above comments, it is interesting to note that around a third of the sample did report holding some sort of esoteric beliefs. What is not clear from the current findings is what nature of this belief is. Following the work of Schofield-Clark (2003) and Berger and Ezzy (2007) it may be appropriate to develop more in-depth, qualitative understandings of contemporary religious and spiritual worldviews. As Heelas and Woodhead (2004) and Voas (2007) demonstrate, much of the depth that underpins faith and belief is masked by pre-defined questions and answer categories. Further research is now needed to understand more fully the contemporary religious landscape in order to see if the current levels of religious endorsement are generalizable to the wider population, and the extent to which Tobacyk's notions of paranormal belief are still endorsed by a general population. As has been noted by Schofield-Clark (2003) and Voas (2007) there are significant correlations between age and religiosity whereby older adults are more likely to endorse both traditionally religious and spiritual beliefs. The current study was limited to a younger sample who, based on these arguments, may have differing worldviews in terms of religiosity compared to older adults.

The third conclusion concerns the relationships between paranormal belief and the HEXACO-PI-R. As previously stated, research has established a positive relationship between paranormal belief, neuroticism and openness to experience when using the Five Factor model. The current findings suggest that overall belief in the paranormal is not related to any single personality factors. However, when paranormal beliefs are examined individually, belief in superstition is negatively correlated with honesty/humility, conscientiousness, and openness to experience, while belief in precognition is also negatively correlated with honesty/humility and openness. Negative correlations with honesty/humility and conscientiousness support an understanding of an individual who is socially conforming, honest, and is more likely to seek logical explanations for phenomena. Therefore, such an individual is less likely to accept paranormal phenomena as real (Zingrone, Alvarado, & Dalton, 1998) as there is less acceptance of ambiguity in their worldview. These significant results relating to the honesty/humility dimension further illustrate the advantage of the HEXACO model of personality over the Five Factor Model.

The fourth conclusion concerns the correlations present after controlling for sex and age as suggested by Lange, Irwin and Houran (2000), who argue that the Revised Paranormal Belief scale is subject to both age and gender biases. The current results demonstrate that when these two variables are controlled for the relationships between honesty/humility and openness to experience and both belief in superstitions and belief in precognition are maintained. Despite the weak levels of these correlations, and the low variance explained, these results can be taken as an indication that honesty/humility and openness to experience are factors within some aspects of paranormal belief. According to Ashton and Lee (2007) those who record high scores in honesty/humility could be characterised as being sincere, honest, faithful, loyal and modest. As argued by Aghababaei (2012) this dimension of personality can be seen as most strongly correlated with traditional religiosity (although this

relationship was not present in the current study), and therefore a negative correlation between honesty/humility could be assumed. As Milas, Mlacic, and Miklousic (2012) have argued, belief in the paranormal can be seen as related to negative aspects of personality; thus, the current results could suggest that those who record higher levels of belief in some aspects of the paranormal will also record lower scores in honesty/humility, and could therefore be described as showing traits of slyness, deceitfulness, greed and hypocrisy, akin to the Dark Triad of personality (Lee & Ashton, 2004b).

Following on from the correlations, the multiple regression analysis clarifies the relationship between personality and paranormal beliefs. The analysis demonstrated that, in general, personality was not a consistently strong predictor of all seven paranormal belief dimensions, but statistically significant negative relationships were demonstrated between precognition and honesty/humility, and between superstition and both conscientiousness and openness. This findings contradict those of Pennycook, Goodwin, and McHenry (2014) who argue that such beliefs would indicate a higher tolerance for ambiguity in a respondent's life. However, the results of the current study suggest that openness to experience is negatively related to some aspects of paranormal belief. This contradictory finding requires further investigation to be fully investigated.

In conclusion, this study set out to establish the relationship between paranormal beliefs and personality. Some small, but significant, negative correlations were found between paranormal belief (specifically superstition and precognition) and honesty/humility, conscientiousness and openness to experience. In addition to supporting the utility of the HEXACO model of personality, these findings suggest that paranormal beliefs can be seen to relate to these personality traits and could indicate that those who are more open to paranormal beliefs are less open to ambiguity of experiences, and are less likely to be socially conforming, honest and sincere (as measured by the honesty/humility dimension).

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Tables

Table one Scale properties and percentage endorsement for the Tobacyk Revised Paranormal Belief Scale

Item	Subscale r	RPBS r	% endorsement
Traditional Religious Beliefs			
The soul continues to exist though the body may die	.62	.79	30
The is a devil	.79	.63	15
I believe in God	.73	.39	20
There is a heaven and a hell	.73	.57	14
Subscale alpha	.87		
Psi			
Some individuals are able to levitate (lift) objects	.81	.81	9
Psychokinesis does exist	.84	.84	10
A person's thoughts can influence the movement of a physical object	.84	.83	5
Mind reading is not possible*	.23	.27	18
Subscale alpha	.83		
Witchcraft			
Black magic really exists	.72	.77	17
Witches do exist	.77	.65	18
Through the use of formulas and incantations, it is possible to cast spells on persons	.71	.76	9
There are actual cases of witchcraft	78	.66	18
Subscale alpha	.88		
Superstition			
Black cats can bring bad luck	.82	.68	10
If you break a mirror you will have bad luck	.73	.64	10
The number "13" is unlucky	.82	.75	7
Subscale alpha	.89		
Spiritualism			
Your mind and soul can leave your body and travel	.73	.78	15
During altered states the spirit can leave the body	.79	.78	16
Reincarnation does occur	.68	.68	19
It is possible to communicate with the dead	.69	.73	22
Subscale alpha	.87		
Extraordinary life forms			
The abominable snowman of Tibet exists	.59	.63	3
The Loch Ness monster of Scotland exists	.62	.53	7

There is life on other planets	.51	.02	34
Subscale alpha	*.60*		

Precognition

Astrology is a way to accurately predict the future	.73	.64	7
The horoscope accurately tells a person's future	.59	.59	6
Some psychics can accurately predict the future	.62	.64	23
Some people have an unexplained ability to predict the future	.63	.67	27
Subscale alpha	*.82*		
Overall Subscale		.95	

Note RPBS r = item rest of test for the Revised Paranormal Belief Scale

Table two Scale properties and descriptive statistics for the HEXACO-PI-R

Scale	Min	Max	Mean	Standard Deviation	Alpha Coefficient
Honesty/Humility	28	70	50.93	7.68	.78
Emotionality	29	71	62.27	8.27	.82
Extraversion	21	78	49.38	8.56	.86
Agreeableness	26	65	46.39	7.38	.81
Conscientiousness	39	69	52.57	7.11	.77
Openness	36	74	52.49	8.17	.81

Table three Pearson Product Moment Correlations between Tobacyck's Revised Paranormal Belief Scale and the HEXACO-PI-R

	Age	Hon	Emot	Ext	Agr	Conc	Ope	Psi	Witch	Sup	Spiri	ELF	Prec	Trad	RPBS
Gend	-.06	.06	.40***	.06	-.07	.03	-.25**	-.05	.11	.14	.07	-.02	.15	-.01	.07
Age	1	.15	-.16	.09	-.01	-.09	.08	.27**	.22*	.14	.23**	.13	.07	.07	.21*
Hon		1	.13	-.02	.24**	.05	.12	-.05	.02	-.19*	.07	-.10	-.23**	.07	-.06
Emot			1	.15	-.10	.14	-.10	-.03	-.02	.01	.05	-.16	.07	.09	.02
Ext				1	.07	.30***	-.03	.03	-.11	.07	-.01	-.03	.01	.03	-.01
Agree					1	-.05	-.02	.01	.01	-.03	.01	.01	.05	-.09	-.01
Conc						1	.24**	-.13	-.13	-.21*	-.07	-.08	-.10	.07	-.11
Open							1	-.07	-.07	-.29***	.03	-.16	-.22**	.15	-.09
Psi								1	.75***	.68***	.79***	.66***	.69***	.46***	.89***
Witch									1	.60***	.77***	.55***	.67***	.44***	.86***
Sup										1	.61***	.55***	.68***	.44***	.80***
Spirit											1	.56***	.72***	.58***	.91***
ELF												1	.53***	.20***	.69***
Precg													1	.39***	.83***
Trad														1	.67***

Note: Hon: Honesty/Humility; Emot: Emotionality; Ext: Extraversion; Agr: Agreeableness; Conc: Conscientiousness; Ope: Openness; Psi: Psi Phenomena; Witch: Witchcraft; Sup: Superstitions; Spiri: Spiritualism; ELF: Extraordinary Life Forms; Prec: Precognition; Trad: Traditional Religious Beliefs; RPBS: Revised Paranormal Belief Scale.

*p<.05; **p<.01; ***p<.001.

Table four Partial correlation between paranormal belief and HEXACO-PI-R controlling for age and gender

	Emot	Ext	Agree	Conc	Open	Psi	Witch	Sup	Spirit	ELF	Precog	Trad	RPBS
Hon	.12	-.06	.26**	.04	.11	-.07	-.01	-.20*	.04	-.10	-.24**	.07	-.08
Emot	1	.14	-.06	.09	-.03	.06	-.01	.02	.07	-.13	.05	.13	.05
Ext		1	.07	.30**	-.03	.02	-.14	.06	-.03	-.04	-.00	.03	-.02
Agree			1	-.02	-.03	-.01	.01	-.04	.02	-.01	.06	-.09	-.02
Conc				1	.23**	-.08	-.09	-.17	-.03	-.04	-.07	.09	-.07
Open					1	-.08	-.04	-.25**	.05	-.15	-.18*	.16	-.06
Psi						1	.74***	.68***	.79***	.64***	.70***	.46***	.89***
Witch							1	.58***	.75***	.53***	.66***	.44***	.85***
Sup								1	.59***	.53***	.67***	.45***	.79***
Spirit									1	.56***	.72***	.58***	.90***
ELF										1	.52***	.28***	.68***
Precog											1	.39***	.83***
Trad												1	.67***

Note: Hon: Honesty/Humility; Emot: Emotionality; Ext: Extraversion; Agree: Agreeableness; Conc: Conscientiousness; Open: Openness; Psi:

Psi Phenomena; Witch: Witchcraft; Sup: Superstitions; Spirit: Spiritualism; ELF: Extraordinary Life Forms; Precog: Precognition; Trad:

Traditional Religious Beliefs; RPBS: Revised Paranormal Belief Scale.

*p<.05; **p<.01; ***p<.001.

Table five Linear regressions between personality and paranormal belief

Variable	Psi			Witchcraft			Superstition			Spirituality			Extra			Precog			Trad		
	B	$SE\ B$	β	B	$SE\ B$	β	B	$SE\ B$	β	B	$SE\ B$	β	B	$SE\ B$	β	B	$SE\ B$	β	B	$SE\ B$	β
Honesty	-.01	.04	-.03	.01	.04	.03	-.05	.03	-.15	.03	.04	.06	-.01	.02	-.05	-.10	.04	-.25**	.03	.04	.07
Emo	-.08	.04	-.02	-.00	.04	-.00	.01	.03	.01	.02	.04	.05	-.04	.02	-.17	.04	.03	.11	.04	.04	.09
Ext	.03	.03	.08	-.03	.04	-.08	.04	.03	.11	.01	.04	.01	-.00	.02	-.01	-.01	.03	-.02	.01	.04	.03
Agree	-.03	.04	-.07	.00	.04	-.00	-.01	.03	-.02	.00	.04	.00	.00	.02	-.00	.05	.04	.12	-.04	.04	-.10
Conc	-.07	.04	-.15	-.04	.05	-.90	-.07	.03	-.19*	-.05	.05	-.09	-.00	.02	-.01	-.02	.04	-.05	.00	.05	.00
Openness	-.01	.04	-.03	-.02	.04	-.05	-.07	.03	-.22*	.02	.04	.05	-.04	.02	-.17	-.07	.03	-.17	.06	.04	.15
R^2	.03			.02			.13			.01			.06			.11			.05		
F for change in R^2	0.06			0.05			3.49**			.31			1.41			2.73*			1.02		

Note: Honesty = Honesty/Humility; Emo = emotionality; Ext = extraversion; Agree = Agreeableness; Conc= Conscientiousness; Extra= Extraordinary life forms; Precog = Precognition; Trad= Traditional religious beliefs

p < .05. **p* < .01.