RATIONAL THINKING AND BELIEF IN PSYCHIC ABILITIES: IT DEPENDS ON LEVEL OF INVOLVEMENT [1] [2]

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Summary. Previous research has shown that lay believers in psychic abilities are more prone to intuitive thinking, less inclined to rational thinking, and have an external locus of control, compared to non-believers. Psychic practitioners, however, may have different characteristics. Psychic practitioners (N=31; mean age = 42.7 years, *s.d.*=13.1), lay believers (N=33; mean age = 33.0 years, *s.d.*=10.3), and non-believers (N=31; mean age = 34.4 years, *s.d.*=15.4) completed questionnaires measuring thinking styles, locus of control, and psychic belief. Comparisons of lay believers with non-believers confirmed previous observations; believers had a higher propensity for intuitive thinking, lower propensity for rational thinking, and more external locus of control. In contrast, practitioners were equivalent to non-believers in rational thinking and had the highest internal locus of control. This highlights the importance of considering level of involvement with psychic practice in understanding the thinking styles of believers. Results suggested that practitioners may have rationalised their beliefs and constructed a coherent model of psychic phenomena that satisfies a propensity for rational thinking within a community of belief.

Keywords: thinking style, rational, intuitive, locus of control, psychic

The psychic abilities of telepathy, precognition, and clairvoyance clearly contradict widely-accepted scientific principles. The study of belief in psychic phenomena has tended to take a critical view of believers, for example, branding them "irrational, credulous, uncritical and foolish" (Alcock, 1981) or "normal people whose normal thinking has gone wrong in some way" (Shermer, 1997, p45). Yet this characterisation of believers as lacking in rationality may not apply to professional psychics who have completed courses of study at psychic colleges, who teach in these colleges, and who have published articles and books. Those who have devoted a high degree of commitment to their professional practice might also have devoted considerable rational thought to their beliefs. To date there has been little research looking into the thinking styles of psychic practitioners as a distinct sub-group of believers and the present study aimed to address this topic.

Rational thinking can be conceived as conscious, verbal, deliberate, analytical, rule-based, effortful, and independent of affect. In contrast, intuitive-experiential thinking is automatic, preconscious, non-verbal, fast, effortless, holistic, and highly associated with affect. Tendencies towards these modes of thinking function independently and orthogonally, rather than as two ends of a uni-polar scale (Epstein, Pacini, Denes-Raj, & Heier, 1996). Within this model an intuitive style of thinking is not seen as the result of a lower level of cognitive functioning or a series of cognitive shortcuts, but as a self-contained, organised and adaptive system.

It is generally accepted that paranormal beliefs rely on an intuitive style of reasoning which values personal experience as the main influence on belief systems (e.g., Murphy & Lester, 1976; Brugger & Baumann, 1994; Dudley, 2002;Aarnio & Lindeman, 2005). Substantial empirical evidence has linked paranormal belief to a preference for intuitive thinking (e.g., Epstein *et al*., 1996; Wolfradt, Oubaid, Straube, Bischoff, & Mischo, 1999;

Irwin & Young, 2002; Aarnio & Lindeman, 2005; see e.g., French & Stone, 2014, for a review).

On the other hand, a propensity for rational thinking has been linked to lower levels of belief in the paranormal (e.g., Alcock & Otis, 1980). For example, Pennycook, Cheyne, Seli, Koehler, and Fugelsang (2012) proposed that the rational style of thinking promotes the detection of contradictions between paranormal abilities and basic scientific principles. They suggested that individuals with a propensity to employ an analytic thinking style would show a history of questioning and rejecting claims of paranormal phenomena and abilities. In accordance with this idea their results showed that the participants who had a greater propensity to use an analytic cognitive style had lower levels of paranormal belief, even after controlling for cognitive ability. Other researchers have reported similar results of a negative association of paranormal belief with preference for the rational thinking style (e.g. Irwin & Young, 2002; Aarnio & Lindeman, 2005) though some have observed no association (Epstein *et al*., 1996).

A contrasting position was revealed in the study by Wolfradt *et al*. (1999) which explored the pattern of relationships between thinking styles and paranormal belief. The study employed the Rational-Experiential Inventory (REI; Epstein *et a.l*, 1996) as a measure of rational and intuitive thinking styles, as well as the Anomalous Experiences Inventory which measures paranormal belief as one of its subscales. A cluster analysis of the results found four distinct groups of thinking styles formed by high and low levels of rational and intuitive thinking, in accordance with the orthogonal nature of the REI proposed by Epstein *et al*. (1996). The high-rational and low-intuitive group reported the lowest level of anomalous experiences and beliefs (as would be expected) but the highest levels of belief were reported by participants in the 'complementary' group with high-rational and high-intuitive thinking styles. This contrasted with the view that paranormal belief is related to a lower degree of

rational thinking (e.g. Irwin & Young, 2002; Aarnio & Lindeman, 2005; Pennycook *et al*., 2012).

A possible resolution to the apparent contradiction was suggested by the observation of Wolfradt *et al*. (1999) that the group with the complementary thinking style (high intuitive and high rational) also reported the highest level of self-assessed psychic abilities (effect size was not reported). Perhaps a strong belief in one's own psychic ability demands an exercise of rational processes to justify and sustain the belief, and this in turn might create a stronger commitment to the belief. If this is the case, then individuals who have invested a great deal of commitment in their psychic practice (and therefore, presumably, have a high level of belief in their abilities) may also have given considerable conscious deliberation to their beliefs.

The proposition that a preference for rational thinking might be related to commitment to psychic practice seems somewhat analogous to the observation by McGarry and Newberry (1981) that locus of control was more internal in the group of psychic readers than other groups (subscribers to a newsletter, visitors to a psychic fair, and student with no particular interest; effect sizes were not given). Further, belief in the paranormal was correlated with internal locus of control in individuals with a high level of involvement in psychic practice (correlation coefficient of 0.39 in the group of psychic readers), but tended to be associated with an external locus of control in individual with a lower degree of involvement (0.13, ns, in the group of students). Locus of control describes the source of those factors which are perceived to exert the strongest influence on major happenings of personal significance: an external locus of control represents the belief that external forces (e.g., fate, luck, or powerful people) have the greater influence, whereas an internal locus of control represents the belief that events of personal significance are determined by the individuals' own deeds (e.g. Rotter, 1975). Typically, belief in psychic phenomena has been theoretically and empirically

associated with external locus of control. For example, Scheidt (1973) proposed that precognition/fate would constitute an external force to which the major events in an individual's life could be causally attributed and there is an accumulated body of research that links belief in psychic phenomena to external locus of control (e.g., Thalbourne, Dunbar & Delin, 1995; Groth-Marnat & Pegden, 1998; Newby & Davis, 2004).

The present study contrasted the thinking styles and locus of control of psychic practitioners with groups of believers and non-believers in the general population. It was predicted that believers would have higher propensity for intuitive thinking, lower rational thinking, and more external locus of control, than the non-believers. Psychic practitioners would resemble believers with a high propensity for intuitive thinking but would resemble non-believers with a high propensity for rational thinking and internal locus of control. Rational thinking would be positively related to belief in the group of practitioners, and negatively related to belief in the group of non-believers. Intuitive thinking would be positively related to belief in the group of practitioners and the group of believers. Participants with high levels of intuitive and rational thinking styles were predicted to have the highest levels of belief in psychic abilities.

Method

Participants

Psychic practitioners were recruited from three psychic colleges in the UK. They comprised 15 men and 16 women, with ages ranging from 19 to 80, mean 42.7 years, *s.d.* =13.1. Practicing psychics were defined as individuals who had written articles on the subject of the paranormal, had given at least one hundred psychic readings, and had completed advanced training or were teaching in a psychic college (average number of years of study was over 5 years).

Non-practitioners were recruited via advertisements placed around the University of East London and on social media. They comprised 34 men and 30 women. Some (n=5) were beginner students at a psychic college, some were students at the University of East London, and some were members of the general public, resident in London, UK. Participants with a score of 11 or above on the 13-item version of the Australian Sheep-Goat Scale were placed in the group of Believers (n=33). They comprised 18 men and 15 women, with ages ranging from 22 to 71, mean age = 33.0 years, *s.d.*=10.3, and they included all of the beginner students in a psychic college. Participants with a score 10 or less were placed in the group of Non-believers (n=31). They comprised 15 males and 16 females, with ages ranging from 23 to 84, mean age = 34.4 years, *s.d.*=15.4. There were no differences among the three groups on gender [Pearson chi-square (2) = 0.33, ns]. The practitioners tended to be somewhat older than the other groups but there was no difference between believers and non-believers.

This approach to recruitment was taken in order to recruit believers and non-believers from similar populations to avoid the introduction of potential confounding factors. Any approach that attempted to deliberately target believers and non-believers would, of necessity, have to target different populations. Practitioners were recruited from a separate population but this was inevitable given the low level of practitioners who could be found in a random sample. Practitioners differed from the small number of lay believers recruited from the psychic college on their level of practice; the lay believers had very low levels of practice.

The sample sizes were decided on the basis of a power calculation with anticipated effect size>=0.67, alpha=0.05, power=0.8, which yielded a sample size of 29 participants per group. Numbers were roughly balanced in the three groups.

Design

This study employed a non-experimental factorial design. The independent variable was the group to which the participants were assigned: one of Practitioner, Believer, or Non-believer. Gender and age were investigated as other independent variables. The dependent variables were belief in psychic abilities, propensity for rational thinking, propensity for intuitive thinking, and Locus of Control.

Measures

Participants were asked to complete four measures. The first questionnaire was designed to discover participants' level of psychic practice: estimated number of psychic readings given; number of books or articles written; the highest level of psychic training courses completed; and status as student or teacher.

Paranormal belief was measured by the Australian Sheep-Goat Scale (Thalbourne & Delin, 1993), a well-known and widely-employed measure of belief focusing on those psychic abilities that were relevant to the design of the present study. Within parapsychology, believers in the paranormal are referred to as "sheep" and sceptics are "goats". The first 13 items were used, which indicate a belief in the existence of psychic abilities (e.g., "I believe in the existence of ESP" and "I have had at least one premonition about the future that came true and which (I believe) was not just a coincidence") and belief in personal abilities (e.g., "I believe I am psychic"). Against these statements participants were asked to circle 0 (false), 1 (uncertain) or 2 (true). The answers to these questions were summed to give the participant's overall score on this shortened version of the Australian Sheep-Goat Scale. Five items referring to psychokinetic ability, which was not relevant to the study, were omitted from the scale to shorten the task for participants. This 13-item version of the Australian Sheep-Goat Scale was originally created by Thalbourne (1985). Irwin (1985) reported that it correlated 0.69 with the total scores on the Paranormal Belief Scale which attested to its convergent

validity. According to Thalbourne and Delin (1993) the 13-item version of the Australian Sheep-Goat Scale correlated extremely highly with the 18-item version, r=0.97 over 345 participants. Hence, it appears that the 13-item version and the 18-item version are essentially measuring the same construct. Thalbourne and Delin (1993) also noted that Cronbach's alpha was 0.94 for the 18-item version and that there were correlations between 0.19 and 0.72 with other measures of paranormal belief. Thalbourne (1998) further reported correlations of 0.54 with magical ideation and 0.56 with mystical experience.

Thinking style was measured by the Rational-Experiential Inventory (REI) of Epstein *et al*. (1996), a self-report measure of individual preferences for rational and experiential-intuitive thinking styles, consisting of 31 questions in two subscales. The Need for Cognition subscale measures the extent to which people enjoy partaking in cognitively taxing activities and is an indicator of a rational thinking style. Individuals who score highly on Need for Cognition tend to have an inquiring attitude, to enjoy solving complex problems, and to think abstractly. The subscale consists of 19 items (e.g., "I prefer complex to simple problems" and reverse-scored "Thinking is not my idea of fun"). The Faith in Intuition subscale measures the degree to which people trust their feelings and initial intuitions about themselves, others, and their environment. It consists of 12 items, none reverse scored (e.g., "I trust my initial feelings about people" and "I am a very intuitive person"). Respondents are asked to respond by marking a five-point scale from '*1-Strongly disagree'* to '*5-strongly agree'*. Epstein *et al.* (1996) reported Cronbach's alpha of 0.87 for the Need for Cognition scale and 0.77 for the Faith in Intuition scale. Measures of coping ability and academic performance supported the interpretation of the two scales.

Locus of Control (LOC) was measured using the 20-point scale created by McGarry and Newberry (1981). This consisted of the five questions with the highest loadings on each of the four factors identified by Collins (1974) in analysis of responses from 300 participants

to the 46 options on the original forced-choice Rotter (1966) Internal-external control scale. There were 12 items indicating an internal LOC (e.g., “In the long run people get the respect they deserve in this world” and “There really is no such thing as luck”) and eight items indicating an external LOC (e.g., “Sometimes I feel that I don't have enough control over the direction my life is taking” and “Most people don't realize the extent to which their lives are controlled by accidental happenings”). Participants were asked to mark each item on a 5 point scale from ‘*1-Strongly disagree’* to ‘*5- Strongly agree’*.

Procedure

Psychic colleges gave permission to send an invitation via email to teachers and students advertising that individuals were being sought for a psychological study concerning the differences in thinking styles between lay-people and psychic practitioners. The email included a link to an online version of the measures. Alternatively, paper versions of the measures were made available at the colleges for participants to complete in their own time, and to place in a collection box. Other non-practitioners were recruited via advertisements placed around the University of East London and on social media and were invited to complete the questionnaires either online or in hard copy. Ethical clearance was obtained from the University of East London Ethics Committee. Participants were debriefed at the end of the study and were given the researcher’s email address in case they had any questions at a later date.

Analysis

Comparisons of the Need for Cognition, Faith in Intuition, Australian Sheep-Goat scores, and Locus of Control, among the participant groups were conducted using analysis of variance (ANOVA). Age was entered as a covariate and participant gender was entered as an additional independent variable to examine whether these factors might interact with the factor of participant group to influence the dependent variables. Post-hoc comparisons used t-

tests with Bonferroni correction to guard against type 1 error. Relationships among the dependent variables were investigated with bivariate correlations.

Results

Missing data (less than 1%) were replaced by the mean of the appropriate scale or subscale. No outliers were found. Normality was deemed at acceptable levels to run parametric tests. Levene's test for homogeneity of variance revealed heterogeneity for two of the dependent variables: the Australian Sheep-Goat Scale and Need for Cognition. However, One-way ANOVA is robust to violations of homogeneity of variance as long as sample sizes are approximately equal, as was the case in the present study (Howell, 2007; Dancey & Reidy, 2011). Non-parametric tests (Kruskal-Wallis for comparisons among the three groups and Mann-Whitney U test for comparisons of pairs of groups) gave a similar pattern of results to the parametric tests so only the parametric tests are reported.

The Australian Sheep-Goat Scale was scored by summing the responses to all items with no questions being reverse-scored. A higher score indicated a higher belief in psychic phenomena and ability. Cronbach's alpha was 0.96 and Spearman-Brown's split-half reliability was 0.95. The Rational-Experiential Inventory was scored by calculating the totals separately for the Need for Cognition subscale and the Faith in Intuition subscale, with designated items on the Need for Cognition subscale being reverse scored. A higher score indicated a higher level of Need for Cognition or Faith in Intuition, respectively. Cronbach's alpha was 0.85 for the Need for Cognition scale and 0.84 for the Faith in Intuition scale. Spearman-Brown's split-half reliability was 0.85 for the Need for Cognition scale and 0.72 for the Faith in Intuition scale. Correlations in the whole sample, and in each group separately, supported orthogonality of the Need for Cognition and Faith in Intuition (please refer to Table 2). The Locus of Control questionnaire was scored by calculating the totals separately for the external and internal subscales and subtracting the external scores from the

internal scores. A higher score indicated a more internal locus of control. Cronbach's alpha was 0.77 and Spearman-Brown's split-half reliability was 0.59. The scores on all variables were similar for the Believers recruited from the Psychic Colleges and those recruited from the University of East London and social media, please refer to Table 1.

Figure 1 presents the means of the measures. A series of one-way ANOVAs were conducted to compare the scores on Australian Sheep-Goat Scale, Faith in Intuition, Need for Cognition, and Locus of Control between the groups of practitioners, believers and non-believers, with age as a covariate and participant gender as an additional factor. Post-hoc comparisons among the groups used the Bonferroni correction to guard against type 1 error. All variables differed among the three groups: Australian Sheep-Goat Scale - $F(2,92)=249$, $MSE=13.4$, $p=0.000$; Faith in Intuition - $F(2,92)=13.5$, $MSE=42.5$, $p=0.000$; Need for Cognition - $F(2,92)=8.84$, $MSE= 83.8$, $p=0.000$; Locus of Control - $F(2,92)=10.64$, $MSE=18.4$, $p=0.000$. Neither participant age nor gender, nor the interaction of gender with participant group, was significant in any of the analyses (all $F<1.7$, $p>0.19$).

Figure 1 about here

Scores on the Australian Sheep-Goat Scale were higher for practitioners than believers, and higher for believers than non-believers. Similarly, scores on the Faith in Intuition scale were higher for practitioners than believers, and higher for believers than non-believers. Need for Cognition was equivalent in the practitioners and non-believers and lower in the believers. Locus of Control was more internal in the practitioners than in the believers (and marginally more internal in the practitioners than in the non-believers, $p=0.07$, and marginally more internal in the non-believers than in the believers, $p=0.7$). Please refer to Figure 1 and Table 1.

	Practit-ioners	Non-believers	Believers			Effect size Pract vs. Believers
			Total	Psychic College	General believers	
Australian Sheep-Goat scale	24.0[a] (2.0)	3.8[c] (3.6)	18.0[b] (4.8)	15.0 (4.4)	18.5 (4.7)	1.76
Faith in Intuition	49.0[a] (4.6)	40.4[c] (7.5)	44.5[b] (7.0)	45.0 (0.7)	44.4 (7.7)	0.78
Need for Cognition	74.7[a] (4.0)	71.2[a] (8.2)	65.2[b](12.5)	67.0 (7.2)	64.9(13.2)	1.15
Locus of Control	22.0[a] (8.0)	17.1 (6.1)	12.2[b](10.3)	10.0 (9.2)	12.6(10.6)	1.07

Table 1: Mean (and *s.d.*) of scores on the Australian Sheep-Goat Scale, Faith in Intuition, Need for Cognition, and Locus of Control, among the practitioners, believers and non-believers. Superscripts denote means that differ significantly. Note that the believers' scores were similar for those recruited from the Psychic Colleges (n=5) and those recruited via the University of East London and social media (n=28).

Scores on the Australian Sheep-Goat Scale were positively correlated with Need for Cognition [$r(29)=0.52$, $p=0.003$] among the practitioners; negatively correlated with Need for Cognition [$r(31)=-0.30$, $p=0.047$] and positively correlated with Faith in Intuition [($r(29)=0.40$, $p=0.026$] among the believers; and not correlated with Need for Cognition or

Faith in Intuition in the non-believers. Please refer to Table 2. This tends to suggest that the rational thinking style was used in different ways by the practitioners and believers.

	Practitioners			Believers			Non-believers		
	FI	NfC	LoC	FI	NfC	LoC	FI	NfC	LoC
ASGS	- 0.08	**0.52**	- 0.19	**0.40**	**- 0.30**	- 0.16	0.26	0.15	0.28
FI		- 0.19	0.09		- 0.29	- 0.07		- 0.12	0.02
NfC			0.18			**0.52**			0.12

Table 2: Correlations among the dependent variables in the three groups of practitioners, believers and non-believers. Statistically significant correlations are in bold. ASGS = Australian Sheep-Goats scale; FI = Faith in Intuition; NfC = Need for Cognition; LoC = Locus of Control.

A control group was created from the top-scoring third of the believers (n=11) who were matched on their scores on the Australian Sheep-Goat Scale with the practitioners [believers: M=23.5, $s.d.$=1.3; practitioners: M=24.0, $s.d.$=2.0; $t(40)$=0.84, ns]. The practitioners were higher than this control group on their Need for Cognition [$t(40)$=2.77, p=0.019] and more internal on their Locus of Control [$t(38)$=3.57, p=0.001] suggesting that the differences on these variables did not depend on differences in the reported level of belief, but rather on differences in the level of involvement in psychic practice.

Participants were divided into four groups formed by the quadrants of high versus low rational thinking and intuitive thinking (as Epstein *et al*., 1996). One-way ANOVA revealed a significant difference among the four groups in their level of belief in psychic abilities,

$F(3,91)=14.81$, $MSE=58.4$, $p=0.000$. The group with the complementary thinking style (high intuitive and high rational) had the highest level of belief in psychic abilities: complementary group $M=23.1$, $s.d.=5.2$; high-intuitive and low-rational group $M=19.0$, $s.d.=6.7$; high-rational and low-intuitive group $M=10.4$, $s.d.=9.3$; and low rational and intuitive $M=11.0$, $s.d.=8.1$. Planned contrasts confirmed that the complementary group had a higher level of belief than all the other groups: compared to high-intuitive and low-rational $t(91)=2.25$, $p=0.030$; high-rational and low-intuitive $t(91)=5.7$, $p=0.000$; and low rational and intuitive $t(91)=6.2$, $p=0.000$.

Discussion

Psychic believers had a higher preference for intuitive thinking, lower preference for rational thinking, and a marginally more external locus of control, than did the non-believers. Their level of belief in psychic abilities was positively correlated with intuitive thinking and negatively correlated with rational thinking style. This is all in accordance with previous observations in the literature. The practitioner group in some respects resembled an extreme type of believer, having the highest belief in psychic abilities and the highest preference for intuitive thinking. However, and as predicted, this group scored as high as non-believers on rational thinking and had a marginally more internal locus of control than non-believers. Propensity for rational thinking in practitioners was correlated with stronger belief in psychic abilities, in contrast to the believers for whom preference for rational thinking was associated with lower belief in psychic abilities.

When the entire participant sample was divided into four groups form by the quadrants of high vs. low Need for Cognition and Faith in Intuition the highest level of belief in psychic abilities was found in the Complementary group with high Need for Cognition and high Faith in Intuition. This was consistent with the findings of Wolfradt *et al*. (1999) whose

participants with a complementary (high rational, high intuitive) thinking style showed the highest level of belief in the paranormal and self-assessed ability.

Results were consistent with McGarry and Newberry's findings (1981) that a higher level of involvement with psychic practice was associated with internal locus of control. The present results contrasted with other studies reporting that high levels of belief are associated with low levels of rational thinking and with external locus of control. A plausible explanation for the discrepancy is that these other studies did not recruit participants with a high degree of involvement in psychic practice or a high degree of self-assessed ability.

The observation of a positive association between rational thinking and belief in psychic abilities in the group of practitioners may be due to two possibilities: a higher level of belief demands more rationalising to sustain the belief, or alternatively, more exercise of rational thinking leads to an increased in belief. The latter might seem inconsistent with the notion that a propensity for rational thinking would normally be expected to facilitate the detection of contradictions between psychic beliefs and scientific principles (e.g., Pennycook *et al*., 2012). Sustaining a high level of belief requires that practitioners are able to reconcile the contradictions they are likely to have observed, so it is interesting to consider how such reconciliation might be achieved.

One solution might be to require that belief in psychic ability should be integrated in a coherent structure with other related beliefs, but not necessarily integrated with a wider range of scientific laws (e.g. French & Stone, 2014, Chapter 2). Psychic colleges typically offer structured courses with classes, assessments, certificates for successful completion, qualified lecturers with membership of professional bodies, and a literature database. It seems likely that a student at a psychic college would be encouraged to exercise rational thought within areas constrained by the syllabus. Students may find that such reasoning supports belief in an

environment which is relatively closed to mainstream scientific influence so that contradictory ideas are not fully explored. Belief in psychic abilities is a major motivation and requirement for membership of a psychic college, and conformity to the dominant set of beliefs in any group is typically rewarded. Hence, it is likely that students would be encouraged to exercise their propensity for rational thought within bounds that comply with the underlying tenets of the college. For individuals involved in psychic practice, there are systematic processes in a one-to-one interaction, for example, the norm to be polite on the part of the client, that could lead to positive feedback for the psychic and thus help to sustain their belief in their own abilities (e.g., Rowland, 2002).

Sperber (1990) considered the processes involved in the acquisition of different types of belief. In Sperber's model, intuitive belief is formed spontaneously as a result of unconscious inference about the world. An individual with a high-intuitive thinking style will often form a belief automatically on the basis of intuition (Petty, Brinol, Loersch, & McCaslin, 2009). In contrast, reflective belief is one which is subject to an intentional process of explicit validation, including examining the evidence and listening to the relevant authorities. Reflective belief may be formed initially as an intuitive belief but is later justified by deliberate processes of reason and consideration of evidence. Combining these two styles, an individual with a high-intuitive and high-rational thinking style is likely to form beliefs influenced by intuition and then to also elaborate and reflect on their beliefs (Petty *et al.*, 2009). In the environment of a psychic college, this elaboration and reflection, guided by authorities of the college, is likely to sustain the original intuitive belief.

Another common solution to the apparent contradictions between scientific principles and psychic belief could be to take the view that psychic abilities are simply not properly understood by science and that they may not, in fact, contradict the principles of science when appropriate knowledge becomes available. Mussell (2010) noted that the need for cognition is

closely related to epistemic curiosity, defined as a desire for knowledge and to eliminate information gaps, and McGarry and Newberry (1981) noted that many individuals in their sample favoured a scientific analysis of paranormal phenomena. So a person who believes s/he has a psychic gift and who also has high need for cognition might be motivated to study at a psychic college to try to understand her/his gift. Indeed, the website of the Institute of Psychic Practitioners explains that their course for psychics and mediums "goes further by explaining an understandable foundation for the psychic paranormal effects associated with spirit communication at séances".[1]

Although belief in psychic phenomena may be irrational in a scientific sense, involvement in psychic practice may be quite rational in the sense that it provides social and economic benefits as well as status and professional standing. A similar argument was advanced by McGarry and Newberry (1981) to explain why internal locus of control should be higher in practitioners than in lay believers. It is not suggested that the practitioners were engaged in their practice primarily for financial reasons; rather that the various benefits of professional practice could provide an additional motivation to sustain high levels of belief. In this sense the practitioners might resemble members of any of the caring professions in being motivated by a desire to achieve a social status and to earn a living as well as to help others.

The present findings indicated factors that would tend to make a psychic practitioner particularly resistant to persuasion to abandon her/his belief. The practitioner is likely to have given serious consideration to building a coherent theoretical structure to sustain his/her belief. It will not be easily assailed by simply pointing to the contradictory evidence from

[1] Institute of Psychic Practitioners. Retrieved 26th February (2014) from http://www.parapsych.org.uk/html/psychic.html

controlled experimental studies, as selective attention to evidence and partial evaluation of the quality of argument can enable a belief to be sustained even in the face of strong contrary evidence (e.g. French & Stone, 2014, Chapter 6). If psychic colleges were to open themselves up to mainstream science this could make a difference, however, psychic practitioners have their own conceptual understanding, drawing on scientific concepts, of their abilities, so a sophisticated scientific argument would be required. It also seems likely that the social and economic benefits conferred by psychic practice would not be easy for anyone to give up. Education in schools, colleges and universities should build an appreciation of the scientific method that would promote rational appraisal of the claims of psychic practitioners. This might lead in time to a reduction in levels of belief prevalent within society.

Certain limitations of this research should be noted. A limited number of psychic colleges were approached, and while there is no reason to suppose that results would have been any different in another sample, this should be noted. The psychic practitioners were all engaged in some form of psychic consultancy in which they would meet one-to-one with a client to offer guidance and advice (e.g., astrologers, tarot card readers, mediums, clairvoyants, palm-readers, etc). Practitioners involved in other types of practice (e.g., dowsing) might show a different pattern of results. Because of the different recruitment methods used to gain a sample of psychic practitioners compared to believers and non-believers there may have been other, unintended differences among the samples. This was unavoidable given the low level of psychic practitioners in the general population that rendered a focused recruitment necessary but nonetheless this should be taken into account.

Believers and non-believers were recruited heavily from a student population at the University of East London and so may have had higher levels of education than the general population. This could impact on their Internal Locus of Control and Need for Cognition so as

to inflate these scores relative to the general population. A different sample might yield stronger contrasts on these measures between the Practitioners and other groups.

The present study focused on thinking style rather than on critical thinking ability. A review of the literature (e.g., French & Stone, 2014, Chapter 6) suggested a weak consensus linking paranormal believers to lower levels of ability in some types of critical thinking but it was not clear how the deficit should be characterised. The lack of consistency in the literature hampered the identification of a specific underlying type of critical thinking and hence this was not considered to be suitable variable for investigation. The present study therefore focused on thinking style on which there is a clearer consensus. A further limitation which should be noted is that it is not possible to determine whether reported differences in thinking styles are the product of actual differences or of differences in the value placed on rational and intuitive thinking styles. Along similar lines, the psychic practitioners may have felt under particular pressure to appear rational and thus to inflate their propensity for rational thinking, though it is generally true that participants prefer to appear rational and this pressure could have applied also to lay believers and non-believers.

The possibility must be acknowledged that the non-believers may have had higher levels of education than the believers, which could explain their higher Need for Cognition and more internal Locus of Control. However, the review by French and Stone (2014) was inconclusive as to whether belief is related to educational level with several reports that those with a higher level of education have stronger belief in anomalous mental powers. Future studies could measure educational level to see if this might explain differences between believers and non-believers. It should also be acknowledged that any form of education, not only in a Psychic College, would result in a higher Need for Cognition.

This study suggests that there is no simple relationship between the propensity for rational thinking and belief in psychic abilities without taking into account the level of involvement in psychic practice.

References

Aarnio, K., & Lindeman, M. (2005) Paranormal beliefs, education, and thinking styles. *Personality and Individual Differences, 39*, 1227-1236.

Alcock, J. E., & Otis, L. P. (1980) Critical thinking and belief in the paranormal. *Psychological Reports*, 46, 479-482.

Alcock, J. E. (1981) *Parapsychology: Science or magic?* Oxford: Pergamon Press.

Brugger, P., & Baumann, A. T. (1994) Repetition avoidance in responses to imaginary questions: The effect of respondents' belief in ESP. *Psychological Reports*, 75, 883-893.

Collins, B. E. (1974) Four separate components of the Rotter I-E scale: Belief in a difficult world, just world, predictable world and a politically responsive world. *Journal of Personality and Social Psychology, 29*, 381-391.

Dancey, C.P. & Reidy, J. (2011) *Statistics without Maths for Psychology (5th Ed)*, p155. Harlow, UK: Pearson Education.

Dudley, R. T. (2002) Order effects in research on paranormal belief. *Psychological Reports*, 90, 665-666.

Epstein, S., Pacini, R., Denes-Raj, V., & Heier, H. (1996) Individual differences in Intuitive-Experiential and Analytical-Rational Thinking Styles. *Journal of Personality and Social Psychology, 71*, 390-405

French, C. C. & Stone, A. (2014) *Anomalistic Psychology: Exploring Paranormal Belief and Experience*. Palgrave MacMillan.

Groth-Marnat, G., & Pegden, J. (1998) Personality correlates of paranormal belief: Locus of control and sensation seeking. *Social Behaviour and Personality, 26*, 291-296.

Howell, D.C. (2007) *Statistical Methods for Psychology (6th Ed),* p203. Belmont, CA, USA: Thomson Wadsworth.

Irwin, H.J. (1985) A study of the measurement and correlates of paranormal belief. *Journal of the American Society for Psychical Research, 79*, 301-326.

Irwin, H. J., & Young, J. M. (2002) Intuitive versus reflective processes in the formation of paranormal beliefs. *European Journal of Parapsychology*, *17*, 45-53.

McGarry, J. J., & Newberry, B. H. (1981) Beliefs in paranormal phenomena and locus of control. *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.

Mussell, P. (2010) Epistemic curiosity and related constructs: Lacking evidence of discriminant validity. *Personality and Individual Differences, 49,* 506–510.

Newby, R. W., & Davis, J. B. (2004) Relationships between locus of control and paranormal beliefs. *Psychological Reports*, 94, 1261-1266.

Pennycook, G., Cheyne, J. A., Seli, P., Koehler, D. J. & Fugelsang, J. A. (2012) Analytic cognitive style predicts religious and paranormal belief. *Cognition, 123*, 335-346.

Petty, R. E., Briñol, P., Loersch, C., & McCaslin, M. J. (2009) The Need for Cognition. In M.R. Leary & R.H. Hoyle (Eds) *Handbook of Individual Differences in Social behaviour (Chapter 21)*. New York/London: The Guildford Press. pp. 318–329.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General & Applied, 80*, 1-28.

Rotter, J. B. (1975) Some problems and misconceptions related to the construct of internal versus external control of reinforcement. *Journal of Consulting and Clinical Psychology, 43*, 56-67.

Rowland, I. (2002) *The full facts book of cold reading* (3rd ed). London: Ian Rowland Ltd.

Scheidt, R. J. (1973) Belief in supernatural phenomena and locus of control. *Psychological Reports, 32*, 1159-1162.

Shermer, M. (1997) *Why people believe weird things: Pseudoscience, superstition and other confusions of our time*. London: Souvenir Press.

Sperber, D. (1990) The epidemiology of beliefs. In G. Frazer & G. Gaskell (Eds.), *The social psychological study of widespread beliefs* (pp. 25-44). Oxford: Clarendon Press.

Thalbourne, M.A. (1985) Are believers in psi more prone to schizophrenia? [Summary] In R.A.White and J.Solfvin (Eds) Research in Parapsychology 1984 (pp. 85-88). Metuchen, N.J.: Scarecrow Press.

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. (1998) Transliminality – further correlates and a short measure. *Journal of the American Society for Psychical Research, 92*, 402-419

Wolfradt, U., Oubaid, V., Straube, E. R., Bischoff, N., & Mischo, J. (1999) Thinking styles, schizotypal traits and anomalous experiences. *Personality and Individual Differences, 27*, 821-830.

Figure Captions

Figure 1: means of the Australian Sheep-Goat Scale, Faith in Intuition, Need for Cognition, and locus of control, among the practitioners, believers and non-believers. The Need for Cognition scale is adjusted by subtracting 30 from each participant score in order to fit onto the common scale. Bars represent 95% confidence intervals.