

PARAPSYCHOLOGICAL EXPERIENCE AS ANOMALOUS EXPERIENCE PLUS PARANORMAL ATTRIBUTION: A QUESTIONNAIRE BASED ON A NEW APPROACH TO MEASUREMENT

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ABSTRACT: When persons report a parapsychological experience, they may typically be asserting 2 occurrences: that of an anomalous or seemingly inexplicable event, and their interpretation of this event in paranormal terms. Previous studies identifying correlates of the report of parapsychological experiences may have confounded these 2 factors. The authors describe a new questionnaire which teases apart the 2 factors and report a survey which applied the new measure to the assessment of several potential correlates, namely, schizotypal tendencies, emotion-based reasoning, suspension of reality testing, and executive dysfunction. Data from a convenience sample recruited online supported the potential utility of the questionnaire, although it has yet to be demonstrated that the 2 underlying factors do have different correlates.

Keywords: parapsychological experience, anomalous experience, paranormal attribution

The fundamental objectives of this study were to devise a novel procedure for assessing potential predictors of the occurrence of parapsychological experiences and to implement this procedure in the form of a new questionnaire.

Earlier questionnaires have identified psychological correlates of the occurrence (or more pedantically, the report) of parapsychological experiences. Some routine procedures for surveying parapsychological experiences nevertheless may have theoretically significant limitations. Two specific observations in this regard will now be raised.

There is a fundamental measurement problem with one type of questionnaire item sometimes used to survey parapsychological experiences. This type of item identifies such an experience by name (e.g., “telepathy,” “a ghost”), possibly adds a formal definition, and asks respondents if they have encountered this experience. Responses then may be correlated with potential psychological predictors. This approach was used, for example, by Richards (1991) and Kennedy and Kanthamani (1995), and is still evident today. Thus, in the Anomalous Experiences Inventory (AEI, Factor 1; Gallagher, Kumar, & Pekala, 1994; Kumar & Pekala, 2001), currently one of the most widely used inventories for surveying parapsychological experiences (see also Goulding & Parker, 2001), some items refer to experiences explicitly implicating paranormal phenomena (e.g., “I have had a psychic experience,” “I have seen a ghost or apparition”) or to behaviors based on an assumption of the paranormal by the respondent (“I visit fortune tellers, palm readers, tarot card readers or astrologers”). The metric problem with this type of item arises from the underacknowledged fact that some people may undergo an anomalous encounter *without* reconstructing it in terms of the paranormal; that is, the experience may be dismissed as mere coincidence, a misperception or illusion, and the like. With the above type of item, a conventional survey of parapsychological experiences would identify such people as *nonexperiencers* because they deny ever having experienced ESP and the like, yet an independent observer might well construe some of the respondents’ experiences as parapsychological.

A second and more common type of questionnaire item does avoid this limitation. Such items do not refer to the parapsychological experience by name; rather, they provide a noncommittal phenomenological description of the experience and ask survey participants if they have had experiences of this ilk. By way of illustration, the Anomalous Experiences Inventory includes items such as “There have been events that I dreamed about before the event occurred” and “I often know what others are feeling or thinking without them telling me.” Even people who eschew any suggestion of the paranormal may therefore be willing to concede they have had such experiences. This approach may have particular appeal to anomalistic psychologists, researchers who focus primarily on the bases of anomalous experiences rather than on the more specific investigation of hypotheses about paranormal processes.

On the other hand, while this second type of item taps the incidence of anomalous or uncanny events, it also nets people who interpret their experience as paranormal as well as people who do not. The status of the experience in the respondents' eyes therefore is not taken into account. This represents a loss of potentially instructive information. In addition, the technique limits the interpretation that may legitimately be applied to the data. For example, on the basis of responses generated by these items, many researchers are wont to draw conclusions about the correlates of "ESP experiences" and the like, despite the fact that the items merely address an anomalous experience of unattributed origin. Thus, in this type of item perceived "paranormality" on occasion may simply revert to the investigator instead of the respondent.

Matters are further confounded when inventories, such as the Anomalous Experiences Inventory (Kumar & Pekala, 2001) and the Assessment Schedule for Altered States of Consciousness (Van Quekelberghe, Altstotter-Gleich, & Hertwick, 1991), incorporate *both* of the above types of item in a single index. The psychometric issue here can be formulated in the following terms.

When a person reports a parapsychological experience, she or he may typically be asserting two occurrences: that of an anomalous or seemingly inexplicable event, and her or his interpretation of this event in paranormal terms. In a rare allusion to this issue, French and Wilson (2007) discuss the impressions of people who had been conducted on a commercial tour of a reputedly haunted site and remark that the parapsychological experients and nonexperients in this context may "differ with respect to the degree to which they experience mildly anomalous sensations such as sensing a presence, sudden changes in temperature, and dizziness, and the degree to which they opt for a paranormal interpretation of such sensations" (p. 13). Many measures of proneness to parapsychological experiences therefore may be indexing mere proneness to anomalous experiences, or the inclination to appeal to paranormal explanations of life events, or a combination of these. In other words, we often do not know if the correlates of parapsychological experiences reported in the literature are telling us something about proneness to anomalous experiences, or about willingness to make paranormal attributions, or possibly about both.

On this ground, the measure designed for the current investigation, the Survey of Anomalous Experiences (SAE; see Appendix), sought to tease apart these two components. The SAE presents respondents with a series of specific anomalous or uncanny experiences with no integral reference to possible paranormal underpinnings, and if any experience is to be acknowledged affirmatively, respondents are asked to clarify whether the experience is taken as a paranormal event or, on the other hand, as an outcome of one of various possible normal (or at least, nonparanormal) mechanisms. Under this approach one can discern for each respondent both the relative incidence of anomalous experiences and the inclination to attribute such experiences to paranormal processes. Further details of the construction of the SAE are provided in the Method section of this article.

Having designed the SAE, we planned to explore the utility of the measure by assessing several variables for their differential relationship with the two SAE components.

What factors might predict a person's inclination to interpret life events in terms of the paranormal? Such an attribution fundamentally implicates a belief in the paranormal; indeed, the centrality of paranormal belief to a paranormal interpretation verges on tautology. The predictors of paranormal interpretation therefore may include factors understood to be the principal foundations of paranormal belief. There are many such factors (see Irwin, 2009, for a review); the ones chosen for investigation here were some pivotal cognitive processes, namely emotion-based reasoning, suspension of reality testing, and executive dysfunction.

Emotion-based reasoning, the tendency to opt for inferences that are emotionally appealing rather than logically derived, has been found to predict the intensity of paranormal belief (Irwin, Dagnall, & Drinkwater, 2012). Suspension of reality testing, the disinclination to subject inferences to rigorous rational assessment and to re-evaluation as further relevant information comes to hand, also has been shown to correlate with paranormal belief (Dagnall, Drinkwater, Parker, & Munley, 2010; Irwin, 2003, 2004). Finally, believers in the paranormal generally have been reported to exhibit defects in central executive functioning (Wain & Spinella, 2007), the operation of those components of the cognitive-processing system responsible for planning and monitoring complex goal-directed behavior. It was therefore predicted that the tendency to interpret life events in paranormal terms, as indexed by one component of the SAE, is related to emotion-based reasoning, suspension of reality testing, and executive dysfunction.

Proneness to anomalous or uncanny experiences themselves, on the other hand, may more likely stem from personality factors, notwithstanding the involvement of mediating cognitive processes. One predictor of proneness to anomalous experience may be the personality dimension of schizotypy or degrees of subclinical psychotic-like behaviors that are distributed across the general population (Claridge & Beech, 1995). Such a relationship would be expected on the ground that one of the key factorial components of schizotypy is unusual perceptual experience (e.g., Mason, Claridge, & Jackson, 1995). Indeed, there is evidence that the association between schizotypy and unusual experiences goes beyond specifically perceptual experiences (e.g., Fleck et al., 2008; Koffel & Watson, 2009; Mason & Claridge, 1999; Startup, 1999) and also encompasses a very wide range of parapsychological and other transpersonal experiences (Alvarez López, Teixeira do Carmo, & Pueyo, 2000; Byrom, 2009; Clancy, McNally, Schacter, Lenzenweger, & Pitman, 2002; Farias, Claridge, & Lalljee, 2005; B. Greyson, personal communication, "Schizotypy and NDEs," May 8, 2012; Maltby & Day, 2002; McCreery & Claridge, 2002; Parra, 2006; Simmonds & Roe, 2000; Wolfradt, Oubaid, Straube, Bischoff, & Mischo, 1999). It was therefore predicted that proneness to anomalous experiences, as indexed by the other component of the SAE, is related to schizotypy. Note, however, that this does not necessarily impute any pathology to parapsychological experiences (see Goulding, 2004). Further, vigorous debate continues over the ontological status of schizotypy, that is, whether this construct is fully dimensional, quasidimensional (applying only to people formally diagnosed as schizotypal or schizophrenic), or taxonic (categorical). For discussions of this issue, see Lenzenweger (2010) and Rawlings, Williams, Haslam, and Claridge (2008).

At the same time, schizotypy is also a documented correlate of paranormal belief (Dagnall, Munley, Parker, & Drinkwater, 2010; Irwin & Green, 1998–1999; Thalbourne, 1985). That is, schizotypy could well be a predictor not only of proneness to anomalous experiences but also of the inclination to appeal to paranormal explanations of anomalous experiences. In part, the relationship with paranormal belief may be due to the distortions in reasoning inherent in schizotypy (Jolley, Jones, & Hemsley, 1999; Sellen, Oaksford, & Gray, 2005; Tsakanikos, 2004; Young & Mason, 2007) and more generally to deficits in executive functions (Shrira & Tsakanikos, 2009). Schizotypy is nevertheless a multidimensional domain (Mason et al., 1995). There is a possibility, therefore, that proneness to anomalous experiences and inclination to paranormal attributions are related to various facets of schizotypy.

In summary, the following predictions were formulated:

Proneness to anomalous experiences is positively related to schizotypal tendencies (Hypothesis 1).
Proneness to paranormal attributions is positively related to emotion-based reasoning (Hypothesis 2), suspension of reality testing (Hypothesis 3), executive dysfunction (Hypothesis 4), and schizotypal tendencies (Hypothesis 5).

Finally, by way of exploring the specificity of the above relationships, the following supplementary working hypotheses were devised for evaluation; given that previous empirical research has not provided unambiguous grounds for these predictions they are posited purely for comparative purposes.

Proneness to anomalous experiences is positively related to emotion-based reasoning (Hypothesis 6), suspension of reality testing (Hypothesis 7), and executive dysfunction (Hypothesis 8).

Method

Participants

A convenience sample of 203 people participated in this study. There were 49 males and 154 females. The mean age was 30.52 years ($SD = 11.41$) with a range of 18–75 years. Participants included undergraduates and employees from the Manchester Metropolitan University, alumni and similar associates of the university, and some volunteers from the wider community in Manchester, England.

Materials

Participants were asked to complete five questionnaires plus a few items on demographic background. The questionnaires, in order of presentation, were the Barkley Deficits in Executive Functioning Scale (BDEFS; Barkley, 2011), the Emotion-Based Reasoning subscale of the Cognitive Biases Questionnaire (EBRS; Peters et al., 2010), the Reality Testing subscale of the Inventory of Personality Organization (RT; Lenzenweger, Clarkin, Kernberg, & Foelsch, 2001), the Oxford-Liverpool Inventory of Feelings and Experiences, Short Form (O-LIFE; Mason, Linney, & Claridge, 2005), and the Survey of Anomalous Experiences.

The Barkley Deficits in Executive Functioning Scale is a 20-item self-report measure of defects in executive functioning. The BDEFS comprises five subscales, each of four items; Barkley (2011) labels the subscales Self-Management to Time (SMT), Self-Organization (SO), Self-Restraint (SR), Self-Motivation (SM), and Self-Regulation of Emotion (SRE). SMT relates to deficiencies in time management and planning. SO concerns difficulty in organizing one's thoughts and actions (e.g., failure to think quickly in the face of unexpected events). SR taps impulsive behavior and poor inhibition of reactions to events. SM assesses lack of effort and a need for supervision at work. SRE concerns one's inability to sustain concentration on a task and avoid distraction. Responses to each item are made on a 4-point scale (1 = *Never or Rarely*, to 4 = *Very Often*). BDEFS subscale scores are computed as the sum of responses over the respective items and thus potentially may range from 4 to 16, with higher scores representing greater executive dysfunction. The psychometric characteristics of the BDEFS are thoroughly documented (Barkley, 2011) and are generally satisfactory.

The Cognitive Biases Questionnaire (Peters et al., 2010) is a self-report measure of reasoning biases known to be associated with the formation of psychotic delusions. The Emotion-Based Reasoning subscale comprises six items indexing the inclination to draw an inference more for its emotional appeal than for its logical adequacy. For each item a short vignette is presented and the respondent is asked to choose the one of three options that best describes how they would feel about the situation. Each response is rated on a 3-point scale (1 = absence of bias; 2 = presence of bias with some qualification; and 3 = presence of bias). Scores on the EBRS are computed as the sum of ratings over the six items and therefore may potentially range from 6 to 18, with higher scores signifying stronger reliance upon emotion-based reasoning. Peters et al. (2010) report the questionnaire has good psychometric properties.

The chosen measure of reality testing was the 20-item Reality Testing subscale of the Inventory of Personality Organization (Lenzenweger et al., 2001) and measures the inclination to draw inferences without subjecting them to appropriate rigorous critical evaluation (e.g., "I can't tell whether certain physical sensations I'm having are real, or whether I am imagining them"). Responses to the RT are made on a 5-point scale (1 = *Never True*, to 5 = *Always True*), and a total score on the scale is computed as the sum of responses over the 20 items; that is, RT scores may range from 20 to 100. The psychometric characteristics of the scale are impressive (Lenzenweger et al., 2001).

The O-LIFE, Short Form is a 43-item index of dimensional schizotypy. The questionnaire comprises four subscales labeled Unusual Experiences (12 items), Cognitive Disorganization (11 items), Introverted Anhedonia (10 items), and Impulsive Nonconformity (10 items). The Unusual Experiences (UE) subscale, also referred to as positive schizotypy, addresses unusual perceptual experiences and thoughts. Cognitive Disorganization (CD) concerns difficulties with attention and decision-making, with thoughts tending to be disorganized or tangential. Introverted Anhedonia (IA), also known as negative schizotypy, relates to lack of enjoyment in social contact and a tendency to be emotionally flat. Impulsive Nonconformity (IN) indexes impulsive, violent, and reckless behaviors that generally flout rules and social conventions. Respondents are required to answer either "yes" or "no" to each item, and for each scale one point is scored for each answer given in the prescribed direction; the potential range of scores on the four subscales therefore are 0–12, 0–11, 0–10, and 0–10, respectively. In addition, as the UE subscale includes a few items about transpersonal experiences which might bias the relationship with parapsychological variables (see also Thalbourne, 1985), a modified UE score (UE-M) was computed as the sum of responses to all other UE items; the potential range of UE-M scores was 0–8. Mason et al. (2005) report that the psychometric characteristics of the O-LIFE are acceptable.

The Survey of Anomalous Experiences (SAE; see Appendix) was constructed by the first author (HJI) and comprises 20 items addressing anomalous or uncanny experiences. For each item, participants are presented with an anomalous experience described without any explicit reference to its possible paranormal basis. Participants who acknowledge having had such an experience are asked to further clarify their position by stating whether they attributed their experience to a specified paranormal process or to a specified nonparanormal process. Thus, for each item addressing an anomalous experience, the respondent has three response options of the following general form: Option 1 is “yes, and I interpreted it as a (specified) paranormal experience”; Option 2 is “yes, but I interpreted it as due to (specified) normal processes”; and Option 3 is “no.” The SAE yields two scores for each participant. First, an index of *proneeness to anomalous experiences* (PAE) was computed as the percentage of “yes” responses (i.e., Option 1 or 2 in any item) made over the 20 items; thus, this score could range from 0% to 100%. Second, each participant’s proneeness to attribute anomalous experiences to paranormal phenomena was defined as the percentage of “yes” (Option 1 or 2) responses that were “yes, paranormal” (Option 1) responses. In any exceptional cases where not a single “yes” response is made (0 out of 0, an incalculable percentage ratio), an a priori decision was made to exclude these respondents from the statistical analyses of this SAE component on the ground that, given they had had no anomalous experiences, there was no basis on which to assess the degree to which they were inclined to make paranormal attributions about such experiences. For all other participants, the index for *proneeness to paranormal attributions* (PPA) therefore could potentially range from 0% to 100%.

Procedure

The questionnaire inventory was administered as an online survey on an electronic platform known as Bristol Online Surveys (see <http://www.survey.bris.ac.uk>), a system to which Manchester Metropolitan University subscribes. An invitation to participate was distributed via the university’s internal e-mail system and using also a list of alumni and other associates of the university. The aim of the study was stated as the investigation of “how a person’s anomalous or seemingly inexplicable experiences relate to aspects of their everyday thought processes.” People aged at least 18 years were said to be eligible to take part, and their participation was anonymous and completely voluntary, with withdrawal from the exercise permitted at any time. The need for frankness in responding was stressed. The system automatically prevented participation more than once by the same person.

Recruitment was terminated soon after the target of 200 completions had been achieved.

Results

Preliminary Screening of Data

As noted in the Method section, a “proneeness to paranormal attribution” (PPA) index cannot be computed for any participant who has had no anomalous experiences. In the present sample of 203 participants, everyone reported having had at least one such experience. Subsequent statistical analyses of PPA data therefore are based on the full sample of 203 people. The other noteworthy item of relative frequency data is that 77 of the 203 participants (38%) acknowledged at least one anomalous experience that they interpreted as having a paranormal basis. On average, the participants reported having had 7.70 of the 20 anomalous experiences and of these, 1.25 were interpreted in paranormal terms. Further comment on these findings is made in the Discussion.

A further preliminary result was that Cronbach’s alpha for the 20 SAE items was .83. This level of internal consistency is acceptable for the purposes of our study, particularly in light of the diversity of experiences surveyed by this questionnaire. In addition, an anonymous reviewer of this paper asked that we report the internal consistency (Cronbach’s α) of the PAE and PPA. This is not a straightforward request to meet, for the reason that the PAE and PPA are not separate “scales” or subsets of items but rather, higher-order metrics derived from patterns of responses over the full set of items. Nonetheless, we appreciate the spirit in which this request is made and offer the following observations. First, as noted

above, for all responses over all 20 items, Cronbach's α for the SAE in its entirety was determined to be .83. Second, by combining response options 1 and 2 ("yes") and considering these positive acknowledgements of anomalous experiences against the negative ("no") responses, we can estimate that the internal consistency (Cronbach's α) of the PAE index was .78. Given that the experiences surveyed by the SAE range from common to rare, both of these indices of internal consistency may be deemed satisfactory. A similar estimate for the PPA, however, could not be computed: here Option 3 ("no") has to be recoded as missing data, and as several items had no Option 1 ("yes, paranormal") responses and thus had zero variance, any calculation of Cronbach's α based on all 20 items was not possible.

Descriptive Statistics

Descriptive statistics for the principal variables of the study are given in Table 1. The distribution of all but two of the variables was significantly skewed; bivariate relationships therefore were indexed by Spearman correlation coefficients.

Table 1
Descriptive Statistics and Spearman Correlations Between SAE Components and Independent Variables

| Variable | <i>M</i> | <i>SD</i> | <i>Range</i> | <i>Skewness</i> | PAE | Spearman <i>rho</i> | | |
|--------------------------------------|----------|-----------|--------------|-----------------|--------|----------------------|--------|----------------------|
| | | | | | | Uncorrected <i>p</i> | PPA | Uncorrected <i>p</i> |
| <i>SAE components</i> | | | | | | | | |
| PAE | 38.47 | 18.57 | 5–100 | .67* | — | | .35*** | .000 |
| PPA | 13.30 | 22.38 | 0–100 | 1.86* | .35*** | <.001 | — | |
| <i>Schizotypy</i> | | | | | | | | |
| UE | 3.30 | 2.81 | 0–12 | .94* | .52*** | <.001 | .41*** | <.001 |
| UE-M | 2.65 | 2.12 | 0–8 | .58* | .50*** | <.001 | .32*** | <.001 |
| CD | 5.13 | 3.14 | 0–11 | .24 | .29*** | <.001 | .12 | .089 |
| IA | 2.19 | 2.13 | 0–10 | 1.09* | .06 | .412 | .04 | .547 |
| IN | 3.48 | 2.29 | 0–9 | .38* | .27*** | <.001 | .08 | .247 |
| <i>Emotion-based reasoning</i> | | | | | | | | |
| EBRS | 7.87 | 1.93 | 6–15 | 1.16* | .33*** | <.001 | .41*** | <.001 |
| <i>Suspension of reality testing</i> | | | | | | | | |
| RT | 37.78 | 11.64 | 20–87 | 1.09* | .59*** | <.001 | .41*** | <.001 |
| <i>Executive dysfunction</i> | | | | | | | | |
| SMT | 9.48 | 2.92 | 4–16 | .23 | .09 | .201 | -.04 | .607 |
| SO | 7.20 | 2.65 | 4–16 | .91* | .15 | .028 | .07 | .299 |
| SR | 6.75 | 2.44 | 4–16 | .99* | .23** | .001 | .05 | .493 |
| SM | 6.63 | 2.71 | 4–16 | 1.18* | .14 | .041 | -.09 | .201 |
| SRE | 7.73 | 3.29 | 4–16 | .90* | .18* | .011 | .05 | .483 |

* $p < .05$, ** $p < .01$, *** $p < .001$ (corrected within each hypothesis)

Inferential Analyses

The SAE components' relationships with the basic demographic factors of age and gender were inspected, and the only noteworthy finding was a small correlation between PPA and age ($rho = .17$, corrected $p < .05$). Apart from its intrinsic interest, this finding indicates a need to take some account of the factor of age in subsequent analyses.

Table 1 presents the Spearman correlations between components of the SAE (PAE, PPA) and the predictor variables of schizotypy (UE and UE-M, CD, IA, and IN), emotion-based reasoning (EBRS), suspension of reality testing (RT), and executive dysfunction (SMT, SO, SR, SM, and SRE). Bonferroni corrections were applied to the significance levels of the correlation coefficients on a hypothesis-

by-hypothesis basis (Abramson et al., 1999; Shaffer, 1995). To assess the study's stated hypotheses, the authors had planned to undertake a multiple regression analysis for each hypothesis. The common data transformations (logarithm, square root, and inverse) and the elimination of multivariate outliers failed to correct fully the skewed distribution of several of the variables, so for each hypothesis, multiple regression analysis with bootstrapping was undertaken (1,000 samples with bias corrected and accelerated analyses). Bootstrapping is a procedure for using the original sample data to estimate a variable's distribution in the population and thereby avoids the need to meet the statistical requirement for a normal distribution (IBM Corporation, 2011). The analyses are now reported for each of the study's hypotheses in turn.

Hypothesis 1, on the prediction of proneness to anomalous experiences by schizotypal tendencies, is supported by the significant positive correlations between PAE and all facets of schizotypy except Introvertive Anhedonia (Table 1). The hypothesis was assessed further by means of a stepwise multiple regression analysis, with bootstrapping, of PAE scores on UE, CD, IA, IN, and age. The regression equation was significant, $F(5,197) = 11.20$, $p < .001$, adjusted $R^2 = .20$, with UE making an independently significant contribution to the regression, partial $r(196) = .39$, $p < .001$, beta = .44. These findings were replicated even when paranormally oriented items were omitted from the UE scale, $F(5,197) = 9.62$, $p < .001$, adjusted $R^2(196) = .18$, $p < .001$. UE-M: partial $r(196) = .35$, $p < .001$, beta = .42. Taken in conjunction with the Spearman correlations (Table 1), these findings confirm Hypothesis 1.

Hypothesis 2, on the positive relationship between proneness to paranormal attributions and emotion-based reasoning, is supported by the significant correlation between PPA and EBR scores, $r(202) = .41$, $p < .001$. The hypothesis was tested also with a stepwise multiple regression analysis, with bootstrapping, of PPA scores on EBR and age. The regression equation was significant, $F(2,200) = 27.94$, $p < .001$, adjusted $R^2 = .22$, with independently significant contributions to the regression made by both EBR, partial $r(199) = .41$, $p < .001$, beta = .40; and age, partial $r = .24$, $p < .001$, beta = .25. Hypothesis 2 therefore is confirmed.

Hypothesis 3, on the positive relationship between proneness to paranormal attributions and suspension of reality testing, is supported by the significant correlation between PPA and RT scores, $r(202) = .41$, $p < .001$. The hypothesis was further evaluated with a stepwise multiple regression analysis, with bootstrapping, of PPA scores on RT and age. The regression equation was significant, $F(2,200) = 36.22$, $p < .001$, adjusted $R^2 = .26$, with independently significant contributions to the regression made by both RT, partial $r(199) = .47$, $p < .001$, beta = .46; and age, partial $r(199) = .31$, $p < .001$, beta = .28. Hypothesis 3 is confirmed.

Hypothesis 4 concerns the prediction of proneness to paranormal attributions by executive dysfunction. All correlations between PPA and the five aspects of executive dysfunction were nonsignificant (see Table 1). The hypothesis was tested also with a stepwise multiple regression analysis, with bootstrapping, of PPA scores on SMT, SO, SR, SM, SRE, and age. The regression equation reached significance, $F(6,196) = 3.51$, $p < .01$, adjusted $R^2 = .07$; but only the factor of age was independently significant, partial $r(195) = .21$, $p < .01$, beta = .21. This finding, reinforced by the nonsignificant Spearman correlations, leads to the conclusion that Hypothesis 4 is not supported.

Hypothesis 5, on the prediction of proneness to paranormal attributions by schizotypal tendencies, is supported by the significant positive correlations of PPA with the two measures of unusual experiences. For UE, $r(202) = .41$, $p < .001$; for UE-M, $r(202) = .32$. However, other indices of schizotypal tendencies had no relationship to PPA (see Table 1). Hypothesis 5 was then assessed with a stepwise multiple regression analysis, with bootstrapping, of PPA scores on UE, CD, IA, IN, and age. The regression equation was significant, $F(5,197) = 16.86$, $p < .001$, adjusted $R^2 = .28$, with independently significant contributions to the regression made by UE, partial $r(196) = .48$, $p < .001$, beta = .55; and age, partial $r(196) = .24$, $p < .01$, beta = .22. These findings were replicated even when paranormally oriented items were omitted from the UE scale, $F(5,197) = 8.69$, $p < .001$, adjusted $R^2 = .16$. UE-M: partial $r(196) = .32$, $p < .01$, beta = .38; age, partial $r = .25$, $p < .01$, beta = .24. These findings, in conjunction with the Spearman correlations shown in Table 1, confirm Hypothesis 5 insofar as the "unusual experiences" factor or positive schizotypy is concerned.

The remainder of the hypotheses were formulated to test the specificity of the previous predictions. The following results therefore should be regarded merely as supplementary. Under Hypothesis 6, a positive relationship was posited between proneness to anomalous experiences and emotion-based reasoning. This relationship is supported by the correlation between PAE and EBR scores, $r(202) = .33$, $p < .001$, and it

was evaluated further through a stepwise multiple regression analysis, with bootstrapping, of PAE scores on EBR and age. The regression equation was significant, $F(2, 200) = 13.32$, $p < .001$; adjusted $R^2 = .12$, with EBR making an independently significant contribution to the regression, $r(199) = .34$, $p < .001$, $\beta = .34$. Hypothesis 6 is supported.

Hypothesis 7, on the positive relationship between proneness to anomalous experiences and suspension of reality testing, is supported by the significant correlation between PAE and RT scores, $r(202) = .59$, $p < .001$. The relationship then was tested by means of a stepwise multiple regression analysis, with bootstrapping, of PAE scores on RT and age. The regression equation was significant, $F(2, 200) = 44.78$, $p < .001$, adjusted $R^2 = .30$, with RT making an independently significant contribution to the regression, partial $r(199) = .55$, $p < .001$, $\beta = .56$. Hypothesis 7 is supported.

Hypothesis 8, concerning the positive relationship between proneness to anomalous experiences and executive dysfunction, is supported by significant correlations between PAE and two facets of executive dysfunction, Self-Restraint (.23) and Self-Regulation of Emotion, $r(202) = .18$, $p < .01$. The relationship then was assessed with a stepwise multiple regression analysis, with bootstrapping, of PAE scores on SMT, SO, SR, SM, SRE, and age. The regression equation was significant, $F(6, 196) = 2.38$, $p < .05$, adjusted $R^2 = .04$, with SR making an independently significant contribution to the regression, partial $r(195) = .16$, $p < .05$, $\beta = .19$. Hypothesis 8 is supported, at least in regard to Self-Restraint.

Discussion

In discussing the findings of the study, it is useful to begin with a consideration of the data on the SAE itself. As indexed by this questionnaire, every single participant had had at least one anomalous experience. This result invites comparison with the level of acknowledgment in previous surveys of parapsychological experiences that are analogous to the anomalous experiences tapped here. In previous polls (e.g., Kennedy, Kanthamani, & Palmer, 1994) it is commonly reported that up to 40% of participants deny having had any parapsychological experiences at all. The present result strongly suggests that such respondents are intent on rejecting any paranormal interpretation of their life experiences rather than being immune to the occurrence of anomalous experiences per se. In this respect the SAE's separation of the occurrence and the interpretation of experiences appears to have merit.

On the other hand, the relative incidence of participants willing to attribute at least one of their anomalous experiences to paranormal factors, at 38%, seems relatively low in this study. This figure is well below the majority of people in previous polls (e.g., Palmer, 1979) who admit to having had one or more parapsychological experiences. Perhaps in completing the SAE, participants' attention is drawn (for the first time?) to the possibility of interpreting their anomalous experiences in nonparanormal terms, and this context induces them to be more conservative in their paranormal attributions. This interpretation is consistent with the observation that although the participants acknowledged an average 7.70 anomalous experiences, only 1.25 of these were conceded to be paranormal in nature. Future research with the SAE could explore as a contrast an item format comprising an initial query about the nominated experience, and then if the answer is affirmative, a probe to ascertain whether the experience was interpreted as having a paranormal basis (without any explicit reference to potential nonparanormal attributions).

The correlation between the two components of the SAE ($\rho = .35$) was to be expected if the occurrence of anomalous experiences is one factor that facilitates a person's inclination to make paranormal attributions of life events (e.g., see Coll & Taylor, 2004). At the same time, the relationship is not so strong as to call into question the proposition that proneness to anomalous experiences is discriminable from proneness to paranormal attributions.

The inclusion in the study of measures of various independent variables had two objectives. First, there was a need to determine if previously documented correlates of paranormal belief and parapsychological experiences could be replicated with the newly designed SAE questionnaire. Broadly speaking, the replications were successful. One or both of the components of the SAE have been shown to be significantly related to the factors of schizotypy, emotion-based reasoning, suspension of reality testing, and executive dysfunction. In this regard, the SAE's approach to surveying parapsychological experiences is supported and its future use in this context is encouraged.

A second objective was to determine if previously documented correlates of parapsychological experiences may have been confounded by a failure to give due cognizance to a distinction between proneness to anomalous experiences and proneness to paranormal attributions to such experiences. With the present selection of independent variables, our study largely did not succeed in establishing that the two components of the SAE had a different pattern of correlates. Thus, both PAE and PPA alike were related to the factors of schizotypy, emotion-based reasoning, and suspension of reality testing. Only for the variable of executive dysfunction did the SAE components exhibit marked disparity, and this was in the opposite direction to our expectations. There is a need for further research to examine other reported correlates of parapsychological experiences to see if they actually reflect proneness to anomalous experiences, or proneness to paranormal attributions, or both.

The basis of the contrary findings for executive dysfunction is unclear. Previous research (Wain & Spinella, 2007) had identified this factor as a correlate of paranormal belief, so its failure here to predict proneness to paranormal attributions was unexpected. Perhaps even more surprising to us was the observation of a significant relationship between executive dysfunction and proneness to anomalous experiences. In an earlier study by Spinelli, Reid, and Norvilitis (2002), executive dysfunction was not a significant predictor in a multiple regression with measures of personality boundaries and gender roles on "experience with the paranormal." On further reflection, it appears that their measure of personality boundaries in part encompasses proneness to altered states of consciousness (e.g., see Hicks, Bautista, & Hicks, 1999), and this may have been sufficient to suppress the further contribution of executive dysfunction in the analysis conducted by Spinelli et al. In following up this possibility, the first author (HJI) was able to establish that in the data of Spinelli et al. the simple bivariate correlation between parapsychological experience and (defective) executive functioning was significant ($r = .16, p < .05$; Jill M. Norvilitis, personal communication, April 11, 2012). At least, this admittedly weak trend suggests that our finding of an association with proneness to anomalous experiences is not entirely aberrant. Nonetheless, the contrary results for the two SAE components remain to be reconciled. Further investigation is currently being undertaken into the relationship between executive dysfunction and the respective SAE scales.

Another anomalous finding was a positive correlation between proneness to paranormal attributions and age. Although only weak ($\rho = .17$) this result also was contrary to expectations. By and large, demographic factors are not effective predictors of paranormal belief, but where a significant relationship with age has been reported, its direction almost always is negative (see Irwin, 2009 for a review). It is unclear why younger participants in our sample were *less* likely to attribute their anomalous experiences to paranormal processes. Perhaps they were more susceptible than older participants to the suggestion under the second response option that anomalous experiences could well be explicable in nonparanormal terms.

An explicitly anticipated finding was that schizotypy is a predictor of both proneness to anomalous experiences and proneness to paranormal attributions. In this regard, it is interesting that Sumich et al. (2008) report evidence to suggest these tendencies may both be facets of (positive) schizotypy but may spring from distinctly different neurophysiological processes. Perhaps the work of Sumich et al. represents independent support for the validity of the SAE's differentiation of proneness to anomalous experiences and proneness to paranormal attributions.

Some limitations of the study must be acknowledged. One limitation concerns the representativeness of a sample recruited within an English university community through an online appeal. It is not clear, however, why the observed relationships may differ in a wider sample recruited by more traditional methods. Indeed, there is evidence (e.g., Göritz & Schumacher, 2000) that while online recruitment may yield a sample with slightly elevated paranormal beliefs, the relationships between these beliefs and various predictor variables do not differ from those found under other recruitment procedures. Additionally, on the first few occasions, the second author (ND) used online sampling in a study in which he compared scores on paper and computer versions of the questionnaires and found no substantial differences. The generality of our present findings nevertheless remains open to independent scrutiny.

A second limitation is that the order of questionnaires in the test inventory was not counterbalanced across participants. The authors elected to present the SAE as the final questionnaire for all participants in

order that responses to measures of the independent variables would not be constrained in light of what a respondent had disclosed on items about parapsychological experiences. Independent investigation with a different order of presentation nevertheless would be appropriate.

In conclusion, the construction of the SAE was undertaken in response to our perception that previously identified correlates of parapsychological experiences may be compromised by a confounding of two distinct factors, proneness to anomalous experiences and proneness to paranormal attributions. With the set of independent variables used in our study, we were not able to show that previously identified correlates of paranormal belief and parapsychological experiences relate differently to these two factors. On the other hand, our findings more generally do support the use of the SAE in future studies of the correlates of parapsychological experiences. The SAE may effectively be applied in its entirety either in its present form or with a modification in format noted earlier in the Discussion, or the style of SAE items may be applied to research into a single type of parapsychological experience.

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Abstracts in Other Languages

French

L'EXPERIENCE PARAPSYCHOLOGIQUE EN TANT QU'EXPERIENCE
 ANOMALE ASSOCIEE A UNE ATTRIBUTION PARANORMALE :
 UN QUESTIONNAIRE BASE SUR UNE NOUVELLE APPROCHE DE LA MESURE

RESUME : Lorsque des personnes relatent une expérience parapsychologique, elles produisent en fait deux affirmations : celle d'avoir vécu un événement anomal ou apparemment inexplicable, et leur interprétation de cet événement en termes de paranormal. Les études antérieures identifiant les corrélats des expériences parapsychologiques peuvent avoir confondu ces deux facteurs. Les auteurs décrivent un nouveau questionnaire qui distinguent ces deux facteurs et présentent un sondage testant cette nouvelle mesure dans ses corrélats potentiels avec les tendances schizotypiques, le raisonnement basé sur l'émotion, la suspension du test de la réalité, et la

dysfonction exécutive. Les données d'un échantillon de convenance recruté en ligne supportent l'utilité potentielle du questionnaire, bien qu'il soit encore nécessaire de démontrer que les deux facteurs sous-jacents peuvent avoir des corrélats différents.

Spanish

EXPERIENCIAS PARAPSIKOLÓGICAS COMO EXPERIENCIAS ANÓMALAS MÁS ATRIBUCIONES PARANORMALES: UN CUESTIONARIO BASADO EN UN NUEVO ENFOQUE DE MEDICIÓN

RESUMEN: Cuando las personas reportan una experiencia parapsicológica, típicamente afirman 2 eventos: un evento anómalo o aparentemente inexplicable, y la interpretación de este evento en términos paranormales. Estudios anteriores que identificaron correlatos de las experiencias parapsicológicas pueden haber confundido estos 2 factores. Los autores describen un nuevo cuestionario que escinde los 2 factores e informan de una encuesta que usó la nueva medida en la evaluación de varios correlatos posibles, es decir, tendencias esquizotípicas, razonamiento basado en la emoción, suspensión de la prueba de realidad, y disfunción ejecutiva. Los datos obtenidos con una muestra de conveniencia reclutada en la red apoya la posible utilidad del cuestionario, aunque todavía no se ha demostrado que los 2 factores subyacentes tengan diferentes correlatos.

German

PARAPSYCHOLOGISCHE ERFAHRUNG ALS ANOMALE ERFAHRUNG PLUS PARANORMALE ZUSCHREIBUNG: EIN FRAGEBOGEN AUF GRUNDLAGE EINES NEUEN MESSVERFAHRENS

ZUSAMMENFASSUNG: Wenn Personen eine parapsychologische Erfahrung schildern, beschreiben sie typischerweise zwei Ereignisse: Ein anomales und offenbar unerklärliches Ereignis und ihre Deutung dieses Ereignisses in paranormalen Begriffen. Vorangegangene Studien zur Identifizierung von Korrelaten der Berichte über parapsychologische Erfahrungen haben diese beiden Faktoren möglicherweise nicht scharf genug auseinandergelassen. Die Verfasser stellen einen neuen Fragebogen vor, der diese beiden Faktoren voneinander trennt, und berichten über eine Umfrage, in der das neue Messverfahren zur Erfassung mehrerer möglicher Korrelate eingesetzt wurde, nämlich bei schizotypischen Tendenzen, emotionsgeleitetem Schlussfolgern, Verzicht auf Realitätsprüfung sowie unzureichender Handlungsausführung. Daten von einer via online-Befragung gesammelten Gelegenheitsstichprobe unterstreichen die mögliche Brauchbarkeit des Fragebogens, obwohl der Nachweis, dass die beiden zugrunde liegenden Faktoren unterschiedliche Korrelate aufweisen, immer noch aussteht.

APPENDIX

Survey of Anomalous Experiences

Surveys suggest that anomalous, uncanny or seemingly inexplicable experiences are very common in our society. This questionnaire asks if you personally have had some of these experiences, and asks also what you make of them. For each item simply click on the option that most closely represents your own position; if you've have had the experience more than once, choose the option that is most often the case.

Q1. I have had a dream about something of which I was previously unaware, and subsequently the dream turned out to be accurate.

Yes, and it must have been an instance of telepathy or ESP

Yes, but it was probably just a coincidence or unwitting insight

No

Q2. I have stared at the back of someone's head and eventually they turned around and looked at me.

Yes, and it must have been an instance of telepathy or ESP

Yes, but it was probably just a coincidence or something else I did

No

- Q3. Sometimes I've been thinking of a person I haven't heard from in ages, and later in the day I received a phone call, email or letter from that very person.
 Yes, and it must have been an instance of telepathy or ESP
 Yes, but it was probably just a coincidence or rational expectation
 No
- Q4. With someone I know intimately I sometimes know what they are about to say before they say it.
 Yes, and it must have been an instance of telepathy or ESP
 Yes, but it was probably just a lucky guess based on my familiarity with them
 No
- Q5. On at least one occasion I've had the impression of a figure nearby, yet nobody could possibly have been there.
 Yes, and it must have been an experience of an apparition or ghost
 Yes, but it was probably just an illusion or misperception
 No
- Q6. I have become aware of a scent in a room, yet there was nothing there that could have that smell.
 Yes, and it must have been an instance of an apparition or ESP
 Yes, but it was probably just an illusion or physiological anomaly
 No
- Q7. I have had an impression that a specific event was occurring at some distant location and subsequently the impression turned out to have been accurate.
 Yes, and it must have been an instance of clairvoyance or ESP
 Yes, but it was probably just a coincidence or rational expectation
 No
- Q8. I have seen an envelope of light around a person, and the color of the light depended on that person's mood or wellbeing.
 Yes, and it must have been an instance paranormal aura perception
 Yes, but it was probably just an illusion or physiological anomaly in me
 No
- Q9. I have accurately foretold a future event when I could not possibly have known it would occur.
 Yes, and it must have been a case of a premonition or ESP
 Yes, but it was probably just good judgment or a coincidence
 No
- Q10. I have seen a pet become excited shortly before its owner arrived back home.
 Yes, and it must have been an instance of telepathy or ESP
 Yes, but it was probably just the pet having learned when its owner would return or using its acute hearing to detect the owner's approach
 No
- Q11. On at least one occasion I have had the impression that I, my perceiving self, was outside my physical body and seeing the vicinity from an external vantage point.
 Yes, and it must have been a paranormal separation of mind from body
 Yes, but it was probably just an illusion or misperception
 No
- Q12. On at least one occasion I have had the impression I was in direct contact with the spirit of a deceased person.
 Yes, and it must have been an instance of channeling or paranormal communication with a discarnate being
 Yes, but it was probably just an illusion or wishful fantasy
 No
- Q13. I have had the experience of being healed by another person using only the power of their mind.
 Yes, and it must have been a case of psychic healing
 Yes, but it was probably just an effect of suggestibility
 No
- Q14. On at least one occasion an object near me unaccountably moved or fell at the very time a loved one was undergoing a trauma at a distant location.
 Yes, and it must have been an example of paranormal action or psychokinesis
 Yes, but it was probably just a coincidence or a minor earth tremor
 No
- Q15. I have seen (in person or on television) a psychic levitate an object.
 Yes, and it must have been an instance of paranormal action or psychokinesis
 Yes, but it was probably just a conjurer's trick
 No

- Q16. In a life-threatening situation I have had the impression that my disembodied “self” was moving along a tunnel toward a light.
- Yes, and it must have been an instance of spiritual transfer to an after-death world
 - Yes, but it was probably just an illusion, perhaps induced by sudden physiological changes
 - No
- Q17. When I was a child I thought I had lived as a different person in another time and place.
- Yes, and it must have been an instance of reincarnation
 - Yes, but it was probably just an illusion or wishful fantasy
 - No
- Q18. I have inherent abilities that neither of my (biological) parents possessed.
- Yes, and these abilities I must have possessed in a previous lifetime or incarnation
 - Yes, probably because my life experience has differed from that of my parents
 - No, or don’t know
- Q19. While alone in bed at night I have felt someone or something touch me, but when I switched on the light there was nobody else there.
- Yes, and it must have been an instance of a ghost or a demon
 - Yes, but it was probably just an illusion or dream, perhaps caused by anxiety
 - No
- Q20. In magazines I read, the horoscope for my star sign usually turns out to be accurate.
- Yes, because astronomical phenomena have paranormal influences on human life
 - Yes, but astrologers’ statements are often true of anyone, regardless of star sign
 - No, or don’t know