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Paranormal experiences, mental health and mental boundaries, and psi

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Abstract

Previous research has suggested that paranormal beliefs and experiences are associated with thinner mental boundaries and traumas during childhood. This paper examines more thoroughly the relationship between paranormal experiences, mental health and boundaries, and psi abilities. 162 participants completed questionnaires about paranormal experiences (AEI), mental health (MHI-17), mental boundaries (BQ-Sh), traumas during childhood (CATS) and life-changing events (LES). A controlled psi experiment was also conducted. Significant correlations were found between paranormal experiences and mental boundaries, traumas and negative life events. The overall results were non-significant for the psi task and no significant correlation was found between psychological variables and psi results. These findings suggest that mainly mental boundaries concerning unusual experiences and childlikeness are associated with paranormal experiences. They also highlight the importance of association between emotional abuse and paranormal experiences, and that paranormal experiences occur especially frequently after negative life events.

Keywords : paranormal experiences, mental boundaries, trauma, mental health, negative life events, retro-priming, psi, precognition.

1. Introduction

Given the fact that more than half of the population has had at least one paranormal experience[1] (Ross & Joshi, 1992), it is important to understand why people have such experiences. They are sometimes considered as being associated with mental disorders and the *Diagnostic and Statistical Manual of Mental Disorders* (DSM IV) provides criteria for several mental disorders accompanied by paranormal experiences. This association is confirmed by several studies showing a correlation between paranormal beliefs and magical ideation (Eckbald & Chapman, 1983; Tobacyk & Wilkinson, 1990), hypomania and schizophrenia (Windholz & Diamant, 1974), manic depressiveness (Thalbourne & French, 1995) and negative relation with psychological adjustment (Irwin, 1991). On the other hand, some research has suggested that there is no link between paranormal experiences and mental health disorders (Goulding, 2004) and that these experiences could potentially improve well-being (Kennedy & Kanthamani, 1995).

Most of the current research addressing the connection between paranormal beliefs and experiences and mental health uses the concept of schizotypy, a multi-factorial personality construct that appears to be on a continuum with psychosis (Claridge, 1997). A large amount of research has indeed shown a link between schizotypy and paranormal belief and experiences (Schofield & Claridge, 2007). But people who have such experiences mainly have high scores on scales of strange perceptions and beliefs, and rarely have high scores on negative symptoms. Thus, the notions of “happy schizotypes” and "healthy schizotypes" have been proposed (McCreery & Claridge, 1995), and a fully dimensional model of schizotypy has been developed,

[1] When we refer to paranormal "experiences", we are referring to the individual’s attribution that an experience is paranormal. We make no assumptions as to the validity of this attribution.

in which a person can be at an extreme of the schizotypy scale without suffering from a mental disorder. People who have paranormal experiences could belong to this category.

It seems appropriate to question whether these experiences as a whole should be associated with lower mental health and most of the studies have so far concerned paranormal beliefs rather than paranormal experiences. Thus, it seems relevant to use a clinical tool to attempt to understand more precisely whether, overall, paranormal experiences are associated with mental health disorders.

Other research into the psychological variables that correlate with paranormal experiences suggest that thinner mental boundaries, that is the postulated thickness of relations between different mental structures (emotions, thoughts, cognitive process, etc.), may be an important factor. Paranormal experiences and mental boundaries have been studied primarily through the concept of transliminality (Thalbourne, 2000). The notion of mental boundaries has also been widely studied by Hartmann and several distinct boundaries in the mind have been found (for example, about frequency of unusual experiences or need for order) (Hartmann, 1991). Although research indicates links between thinner mental boundaries and paranormal experiences (Houran, Thalbourne, & Hartmann, 2003), we don't yet know very precisely which kind of mental boundaries are associated with paranormal experiences.

Paranormal beliefs and experiences have also been associated with childhood trauma (Wilson & Barber, 1983; Irwin, 1992), abuse (Ross & Joshi, 1992; Lawrence et al., 1995; Perkins & Allen, 2006), need for interpersonal control (Irwin, 1994), and a perceived lack of childhood control (Watt, Watson, & Wilson, 2007). But, it seems that relatively few studies have addressed specifically the links between paranormal experiences and trauma. The present study aims to understand more precisely which sorts of traumas influence the occurrence of paranormal experiences.

Paranormal experiences have also been associated with negative affect and negative experiences (Lindeman & Aarnio, 2006). From a qualitative analysis (Rabeyron, 2006), it appeared that paranormal experiences seem to occur frequently after important negative life events. This connection with paranormal experiences, however, has not yet been empirically demonstrated.

Finally, paranormal experiences could also be considered as a consequence of specific interactions, called "psi", between individuals and their environment (Irwin & Watt, 2007). Despite the fact that such a hypothesis is highly controversial (Alcock, Burns, & Freeman, 2003), some results suggest that this case cannot be dismissed easily (Bem & Honorton, 1994), and more research is needed to address this question.

Thus, the present study will examine more thoroughly the relationship between paranormal experiences, mental health and boundaries, and psi. We predict that people reporting paranormal experiences will have thinner mental boundaries and we will determine which kind of mental boundaries are associated with paranormal experiences. We will then assess the links between paranormal experiences and mental health by using a clinical tool (MHI-17). We also predict that people who have reported trauma during childhood will have more paranormal experiences and we will analyse what kind of trauma. We then predict that people who have had paranormal experiences will have significantly more negative life events.

A second series of hypotheses will test what would be expected to hold if psi was a genuine phenomenon. We predict that people with a higher score on a controlled psi task will have more paranormal experiences, and especially extra-sensory perception experiences, than those with lower scores. We also predict they will have more beliefs in the paranormal, thinner mental boundaries, and more traumas during childhood than people who don't score highly on the psi task.

2. Methods

2.1 Participants

Given that the effect size on the psi task was supposed to be small considering the literature, we used different possibilities to find a lot of participants. There was no specific inclusion or exclusion criteria except the fact that participants didn't suffer from vision or health problem that could have influenced their psi task results. 162 Participants were recruited: 31 from a general population volunteer panel in Edinburgh University's Psychology Department, 114 students from Edinburgh University's intranet website and 17 other participants from advertisements in shops and internet websites. There were more females (71.6%) than males in the whole group. The median age was 28.64 years (range = 18 to 76).

2.2 Measures

Anomalous Experiences Inventory (AEI): This scale is a 70-item true-false questionnaire designed to investigate unusual, anomalous and paranormal experiences, beliefs and abilities, as well as including questions relating to drug and alcohol use and fear of the paranormal (e.g. " I have had a psychic experience", "I am able to communicate with the dead"). The AEI has adequate reliability and validity (Gallagher, Kumar, & Pekala, 1994). We used 4 of the subscales of the AEI: paranormal experiences (29 items), paranormal ability (16 items), paranormal belief (12 items) and paranormal fear (6 items). We also used two other subscales of the AEI (the encounter and poltergeist subscales) and we designed for this study an ESP subscale (11 items).

Mental Health Inventory (MHI-17): A 17-item version of the Mental Health Inventory (Stewart, Ware, Sherbourne, & Wells, 1992) was used. Participants have to evaluate their mental health during the last two weeks. There are five subscales in the MHI-17: anxiety (4 items), depression (4 items), behavioural and emotional control (4 items), general positive (4 items) and emotional ties (1 item). Higher scores on total MHI score indicate better mental health.

Short Boundary Questionnaire (BQ-Sh): The BQ-Sh (Rawlings, 2001) is an empirically derived shortened version of the 145-item Hartmann Boundary Questionnaire (Hartmann, 1991). The BQ-Sh consists of 46 items (e.g. "My dreams are so vivid that even later I can't tell them from waking reality", "I like clear, precise borders", "I am a very sensitive person") with a 5-point Likert-type scale and corresponds to six subscales: unusual experiences (12 items), need for order (12 items), trust (6 items), perceived competence (9 items), childlikeness (5 items) and sensitivity (2 items). The BQ-Sh has adequate psychometric properties (Rawlings, 2001) and it can be considered as a satisfactory alternative to the Boundary questionnaire, with which it strongly correlates ($r = 0.88$).

Child Abuse and Trauma Scale (CATS): This scale provides information on the frequency and extent of negative childhood experiences (Sanders & Becker-Lausen, 1995). The CATS consists of 38 items concerning the general atmosphere of respondents' childhood home environment and treatment, with answers on a 5-point scale ranging from "never"(0) to "always" (5). Three subscales relate to negative home environment/neglect, sexual abuse and punishment. A previous study demonstrated strong internal consistency and test-retest reliability (Sanders & Becker-Lausen, 1995). We also used the Emotional Abuse Subscale that was subsequently developed (Kent & Waller, 1998).

Life Experiences Survey (LES): The LES is a 60-item instrument designed to measure stressful life events and importance of life experiences (Sarason, Johnson, & Siegel, 1978). Participants indicate for each event whether the event occurred within the last six months or

within the last six to twelve months. The LES assesses the type of appraisal of the life experiences (positive or negative). The measure is set on a 7-point Likert-type scale anchored by extremely negative (-3) and extremely positive (3). The test-retest reliability for the LES is sufficient.

Questions about mental health and paranormal experiences: The questionnaire included two questions about mental health ("Have you already suffered from mental disorders?" and "Have you already been in therapy?"). Participants were also asked if they had had a paranormal experience during the last year. If a personal event had happened before the paranormal experience, they had to briefly describe it.

2.3 Psi Task

The computer used was a Dell Optiplex 745 with Windows XP. The program used for the psi task was designed by Daryl Bem at Cornell University with REAL basic. It was a slightly different version than the one used by Bem (2008): this version used pictures as prime instead of words. We used a Windows version of this software, using an algorithm to generate a random sequence of numbers. The software used 64 different images selected from the International Affective Picture System. These pictures could be "positive" pictures (e.g. happy people) or "negative" pictures (e.g. car crash). Between each trial, participants were shown briefly on the screen a picture of a sky with stars in order to avoid an influence from the previous trial on their response time.

This psi task was a precognitive experiment in which response time of participants was measured in order to see if they would be influenced by a prime they would see not before but *after* an emotional picture. Participants were shown a word on each of 64 trials and were asked to press one of two keys on the keyboard as quickly as they could, to indicate whether the word was pleasant or unpleasant. The participant's response time in making this judgment was the major

dependent variable, and the difference in mean response times between incongruent and congruent trials was the index of a priming effect, with positive differences denoting faster responding to congruent trials. The first 32 trials constituted the retroactive priming procedure, and participants were told that a picture would be flashed on the screen just after they made their decision. In this condition, when the participant has a positive result, it appears as though he or she has been "influenced" by the picture seen after the word. A participant who is very permeable to psi information is expected therefore to obtain a very positive score. The remaining 32 trials constituted the standard “forward” priming procedure, and participants were told that from this point on, the flashed picture would appear before rather than after they had made their response. The standard priming condition was used in order to be able to compare psi results with a classical priming effect but also to investigate possible correlations between priming results and other variables.

Response times shorter than 250 ms or longer than 2500 ms were regarded as outliers and were excluded from the data analysis, as were trials on which the participant made an error in judging the picture to be pleasant or unpleasant. Finally, because response-time data were positively skewed, all response times were log-transformed. Shown below is the time sequence of events for Forward Priming and Retroactive Priming trials, respectively.

Forward Priming Trial

Stimulus	*Fixation spot*	*Picture (prime)*	*Blank*	*Word*	*Starry Sky*
Time (ms)	1000	150	150	Response Time	2000

Retroactive Priming Trial

Stimulus	*Fixation spot*	*Word*	*Blank*	*Picture (prime)*	*Blank*	*Starry Sky*
Time (ms)	1000	Response Time	300	500	1000	2000

2.4 Procedure

Participants met the experimenter at the Psychology Building. They were invited to read the information sheet, sign the consent form and complete the questionnaires, after which they did the psi experiment. Finally, participants were debriefed and were paid £5. They received study results by email. The study was approved by the Department of Psychology's ethics panel.

3. Results

3.1 Inter-correlations between variables

The results were analysed using SPSS 14. For analysis of the priming and retro-priming results, 7 participants were eliminated, having made 16 or more errors (>25% of the trials). Age was correlated negatively with BQ-Sh (r_s = -.18, $p < 0.05$, two tailed) and Negative Life Events (r_s = -.33, $p < 0.01$, two tailed). There was no significant difference between the male and female groups and data were not normally distributed. All descriptive data are available in table 1.

[Table 1]

The correlations between the main variables are shown in Table 2. As predicted, BQ-Sh (r_s = .33), CATS (r_s = .44) and Negative Life Events (r_s = .29) correlated significantly with paranormal experiences.

[Table 2]

MHI correlated significantly negatively with paranormal experiences (r_s = -.16) but a series of partial correlations were carried out to explore more precisely the relationships between variables. A partial correlation between mental health (MHI) and paranormal experiences (AEI),

while controlling the scores on childhood traumas (CATS), was not significant (r = .02, ns). Similarly, following a partial correlation to explore the relationship between mental health (MHI) and paranormal experiences (AEI), while controlling for negative life events (LES), the correlation between paranormal experiences and mental health was no longer significant (r = .04, ns). A partial correlation was also performed between paranormal experiences and negative life events, while controlling for traumas. The correlation was still significant (r = .17, $p < 0.05$). Finally, a partial correlation was used to explore the relationship between traumas and negative life events, while controlling for paranormal experiences. The correlation between trauma and negative life events was not significant (r = .07, ns).

3.2 Group comparisons

Participants were divided into two groups based on their score on the AEI - Paranormal Experiences subscale. Those participants with a score less than or equal to 5 experiences were considered to be "few paranormal experiences participants" (P-, $n = 86$) and those with a score greater than or equal to 6 were considered "many paranormal experiences participants" (P+, $n = 76$). This division has been chosen with the use of the mean (mean = 6.16) in order to have two groups with the closest number of participants. Mean Rank, Mean, SD, U, Z and r for the P- and P+ groups on main measures are presented in Table 3.

[Table 3]

We found significant differences between the two groups on the BQ-Sh scale (r = -.25, $p < 0.001$), BQ-Sh - Unusual Experiences subscale (r = -.30, $p < 0.001$) and BQ-Sh - Childlikeness (r = -.24, $p < 0.01$) but also CATS (r = -.38, $p < 0.001$), all CATS subscales and Negative Life events scale (r = -.24, $p < 0.01$). There was no significant correlation between the two groups on

the other BQ-Sh subscales, on all the MHI scales and on priming and retro-Priming results. There were significant differences between groups on the items “have you already suffered from mental disorders?” (X^2 (1) = 3.81, $p < 0.05$, one tailed, phi = 0.15) and “have you already been in therapy?” (X^2 (1) = 3.65, $p < 0.05$, one tailed, phi = - 0.15).

3.3 Analysis of psi results

The results on the retro-priming task were not significant (t = 1.32, df = 154, $p = 0.09$, r = 0.11) while they were significant on the priming task (t = 8.06, df = 154, $p < 0.001$, r = 0.65). A group comparison between negative and positive retro-priming results groups has been conducted. There were no significant differences on the predicted psychological variables between the two groups. We can nevertheless note that group comparisons showed that people with positive psi results had slightly thinner mental boundaries, more paranormal and ESP experiences and better mental health.

4. Discussion

The present study examined the relationship between paranormal experiences and several psychological characteristics. Most hypotheses have been confirmed. First of all, people who have had paranormal experiences have thinner mental boundaries. Only unusual experiences and childlikeness subscales were individually significant for paranormal experiences on group comparison, which suggest that people who have paranormal experiences have specifically thinner mental boundaries on these characteristics. Interestingly, there was also a significant correlation between the priming results and the boundaries questionnaire stemming especially from the correlation with the unusual experiences subscales (r = 0.29, $p < 0.001$). Future research could try to replicate and explain this effect.

We also found a small negative correlation between mental health and paranormal experiences, which is confirmed by the fact that the group of people who have had a lot of paranormal experiences reported having suffer from more mental disorders. Nevertheless, partial correlations suggested that this link may be an artifact, being mediated by traumas and negative life events. This is confirmed by a group comparison showing no significant differences on mental health between people having many or few paranormal experiences. Therefore, paranormal experiences cannot intrinsically be associated with mental health disorders. Furthermore, people who had many paranormal experiences responded that they had spent significantly *less* time in therapy than people who reported fewer paranormal experiences.

We also found a strong significant correlation between paranormal experiences and traumas. This correlation was stronger between traumas and paranormal experiences than between traumas and paranormal beliefs, consistent with Lawrence et al.'s model (1995). Emotional abuse was the more significant measure on group comparison. Paranormal experiences could thus be particularly associated with this kind of abuse. The subjective perception of a spurning or terrorising environment during childhood, studied with the CATS, could be an important aetiological factor in paranormal experiences. Future studies could verify that this link is not the consequence of better memories or imagination of people who have paranormal experiences, even if we already know that there is research suggesting a real link between paranormal beliefs and traumas (French & Kerman, 1996). It could also be relevant to analyze more precisely the association between childhood abuse, the development of dissociative experiences and specific paranormal experiences.

We also showed that negative life events and paranormal experiences were correlated as predicted. This link was confirmed by the fact that more than half of the participants who reported a paranormal experience during the last year also reported one important life change before the paranormal experience. Paranormal experiences could thus be considered as a specific

coping strategy for those facing negative life events. Future research should pay attention more precisely to correlations between different kind of negative events and specific paranormal experiences.

If most of the psychological hypotheses have been confirmed, none of the hypotheses about psi led to firm conclusions. The overall psi results were non-significant even if they were in the predicted direction with an effect size ($r = .11$) relatively close to previous research (Bem, 2008). Even if this result could merely be the sign of the non-existence of psi, it could be the consequence of the use of a slightly different version of the software. Thus, It may be more relevant to take words as prime instead of pictures as in previous research using this protocol. A post-hoc analysis also showed that participants from the positive retro-priming group were significantly slightly younger than the negative retro-priming group ($U = 2418$, mean age = 27.90, SD = 13.27, $p < 0.05$, two tailed). As our population was on average older than the one used by Bem (2008), this could be an eventual explanation for the lower effect that we obtained. However, as this is a post hoc finding, further formal testing of this hypothesis is necessary

In conclusion, this study suggests that specific mental boundaries are associated with paranormal experiences. It highlights the association between emotional abuse and paranormal experiences and demonstrates that paranormal experiences occur especially frequently after negative life events.

References

Alcock, J. E., Burns, J., & Freeman, A. (2003). *Psi Wars: getting to grips with the paranormal*. Charlottesville: Imprint Academic.

Bem, D. J. (2008). Feeling the future III: additional experimental evidence for apparent retroactive influences on cognition and affect. in *Paper presented at the 51st Annual Convention of the Parapsychological Association*. Winchester.

Bem, D. J., & Honorton, C. (1994). Does Psi Exist? replicable evidence for an anomalous process of information Transfer. *Psychological Bulletin*, *115*(1), 4-18.

Claridge, G. (1997). *Schizotypy: implications for illness and health*. Oxford: Oxford University Press.

Eckbald, M., & Chapman, L. (1983). Magical ideation as an indicator of schizotypy . *Journal of Consulting and Clinical Psychology*, *51*(2), 215-225.

French, C. C., & Kerman, M. K. (1996). Childhood trauma, fantasy proneness and belief in the paranormal. In *Annual Conference of the British Psychological Society*. London.

Gallagher, C., Kumar, V. K., & Pekala, R. J. (1994). The anomalous experiences inventory: Reliability and validity. *Journal of Parapsychology*, *58*, 402-428.

Goulding, A. (2004). *Mental health aspects of paranormal and psi related experiences*. Unpublished PhD dissertation. Göteborg: Göteborg University.

Hartmann, E. (1991). *Boundaries in the mind*. New York: BasicBooks.

Houran, J., Thalbourne, M. A., & Hartmann, E. (2003). Comparison of two alternative measures of the boundary construct. *Perceptual and Motor Skills*, *96*(1), 311-23. doi: 12705539.

Irwin, H. J. (1991). A study of paranormal belief, psychological adjustment, and fantasy proneness. *Journal of the American Society for Psychical Research*, *85*(4), 317-331.

Irwin, H. J. (1992). Origins and functions of paranormal belief: the role of childhood trauma and interpersonal control. *Journal of the American Society for Psychical Research*, *86*(3), 199-208.

Irwin, H. J. (1994). Childhood trauma and the origins of paranormal belief: a constructive replication. *Psychological Reports*, *74*(1), 107-11.

Irwin, H. J., & Watt, C. (2007). *An introduction to parapsychology*. Jefferson: McFarland .

Kennedy, J. E., & Kanthamani, H. (1995). An exploratory study of the effects of paranormal and spiritual experiences on peoples' lives and well-being. *Journal of the American Society for Psychical Research*, *89*(3), 249-264.

Kent, A., & Waller, G. (1998). The impact of childhood emotional abuse: An extension of the child abuse and trauma Scale. *Child Abuse & Neglect*, *22*(5), 393-399.

Lawrence, T. R., Edwards, C., Barraclough, N., Church, S., & Hetherington, F. (1995). Modelling childhood causes of paranormal belief and experience: Childhood trauma and childhood fantasy. *Personality and Individual Differences*, *19*(2), 209-215.

Lindeman, M., & Aarnio, K. (2006). Paranormal beliefs: their dimensionality and correlates. *European Journal of Personality*, *20*(7), 582-602.

McCreery, C., & Claridge, G. (1995). Out-of-the-Body Experiences and personality. *Journal of the Society for Psychical Research*, *60*, 129-129.

Perkins, S. L., & Allen, R. (2006). Childhood physical abuse and differential development of paranormal belief systems. *The Journal of Nervous and Mental Disease*, *194*(5), 349-355.

Rabeyron, T. (2006). *Approche psychodynamique et psychopathologique des experiences vécues comme "paranormales"*. Unpublished graduate dissertation, Lyon: Lyon II University.

Rawlings, D. (2001). An exploratory factor analysis of Hartmann's Boundary Questionnaire and an empirically-derived short version. *Imagination, Cognition and Personality*, *21*(2), 131-144.

Ross, C., & Joshi, S. (1992). Paranormal experiences in the general population. *The Journal of Nervous and Mental Disease*, *180*(6), 357-361.

Sanders, B., & Becker-Lausen, E. (1995). The measurement of psychological maltreatment: Early data on the child abuse and trauma scale. *Child Abuse & Neglect*, *19*(3), 315-323.

Sarason, I. G., Johnson, J. H., & Siegel, J. M. (1978). Assessing the impact of life changes: Development of the Life Experiences Survey. *Journal of Consulting and Clinical Psychology*, *46*(5), 932-946.

Schofield, K., & Claridge, G. (2007). Paranormal experiences and mental health: Schizotypy as an underlying factor, *Personality and Individual Differences*, 43, 1908-1916.

Stewart, A. L., Ware, J. E., Sherbourne, C. D., & Wells, K. B. (1992). *Psychological distress/well-being and cognitive Functioning Measures*. Durham: Duke University Press.

Thalbourne, M. A. (2000). Transliminality: A review. *International Journal of Parapsychology*, *11*(2), 1–34.

Thalbourne, M. A., & French, C. C. (1995). Paranormal belief, manic-depressiveness, and magical ideation: a replication. *Personality and Individual Differences*, *18*(2), 291-292.

Thalbourne, M. A., Houran, J., & Crawley, S. (2003). Childhood trauma as a possible antecedent of transliminality. *Psychological Reports*, *93*, 687-694.

Tobacyk, J. J., & Wilkinson, L. V. (1990). Magical thinking and paranormal beliefs. *Journal of Social Behaviour and Personality*, *5*, 255-264.

Watt, C., Watson, S., & Wilson, L. (2007). Cognitive and psychological mediators of anxiety: Evidence from a study of paranormal belief and perceived childhood control. *Personality and Individual Differences*, *42*(2), 335-343.

Wilson, S. C., & Barber, T. (1983). The Fantasy-Prone Personality: Implications for understanding imagery, hypnosis, and parapsychological phenomena. in *Imagery:Current Theory, Research, and Application: Current Theory, Research and Application* (p. 340). New York: Wiley.

Windholz, G., & Diamant, L. (1974). Some personality traits of believers in extraordinary phenomena. *Bulletin of the Psychonomic Society*, *3*, 125-126 .

Table 1

Descriptive statistics for all variable

Scales and subscales	N	Mean	SD	Possible range	Alpha
1. Anomalous Experiences Inventory (AEI)					
a. Paranormal Experiences	162	6.16	4.49	0 - 28	0.84
b. Extra-Sensory Perception subscale	162	3.12	2.37	0 - 11	0.76
c. Encounter subscale	162	1.09	1.69	0 - 10	0.76
d. Poltergeist subscale	162	0.72	1.19	0 - 8	0.73
e. Paranormal Belief	162	5.93	6.64	0 - 12	0.82
f. Paranormal Ability	162	1.33	2.06	0 - 16	0.78
g. Paranormal Fear	162	1.65	1.75	0 - 6	0.76
2. Short Boundary Questionnaire (BQ-Sh)	162	79.56	17.46	0 - 160	0.87
a. Unusual experiences	162	17.14	9.01	0 - 48	0.82
b. Need for order	162	27.90	9.30	0 - 48	0.85
c. Trust	162	12.52	4.19	0 - 24	0.68
d. Perceived Competence	162	16.75	5.39	0 - 36	0.75
e. Childlikeness	162	12.91	3.92	0 - 20	0.75
f. Sensibility	162	4.80	2.11	0 - 8	0.84
3. Mental Health Inventory (MH-17I)	162	67.80	15.46	0 - 100	0.84
c. Anxiety	162	34.66	20.39	0 - 100	0.82
d. Depression	162	27.75	18.84	0 - 100	0.75
e. Behavioral Control	162	28.67	18.25	0 - 100	0.77
f. General Positive	162	61.27	17.52	0 - 100	0.83
g. Emotional ties	162	67.28	25.68	0 - 100	0.78
4. Children Abuse and Trauma Scale (CATS)	162	0.81	0,46	0 - 4	0.82
a. Negligence	162	0.90	0,62	0 - 4	0.76
b. Sexual Abuse	162	0.10	0,27	0 - 4	0.78
c. Punishment	162	1.32	0,57	0 - 4	0.74
d. Emotional	162	1.04	0,73	0 - 4	0.80
5. Life Experience Survey (LES)	162	13.32	8.84	0 - 282	
a. Positive life change	162	6.36	6.05	0 - 141	n/a
b. Negative life change	162	6.96	6.18	0 - 141	n/a
6. Priming and Retro-priming experiment					
a. Priming (logarithm)	155	0.12	0.19	n/a	n/a
b. Retro-Priming (logarithm)	155	0.01	0.09	n/a	n/a
7. Demographics					
a. Age (years)	162	28.68	13.97	18 - 76	n/a
b. Gender (female)	162	71%	n/a	n/a	n/a
c. Have already suffered from mental disorders	162	20.6%	n/a	n/a	n/a
d. Have already been in therapy	162	24.7%	n/a	n/a	n/a
e. Have had a paranormal Experience during last year	162	21.3 %	n/a	n/a	n/a
g. Important life event prior to paranormal experience	34	54.9%	n/a	n/a	n/a

Table 2

Spearman inter-correlations between main variables

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Paranormal Experience	-										
2. ESP Subscale	.88**	-									
3. Encounter Subscale	.68**	.57**	-								
4. Poltergeist Subscale	.73**	.55**	.64**	-							
5. Paranormal Belief	.61**	.45**	51**	.56**	-						
6. BQ-Sh	.33**	.30**	31**	.28**	.31**	-					
7. MHI	-.16*	-.11	-15*	-.17*	-.15*	-.27**	-				
8. CATS	.44**	.41**	.37**	.37**	.31**	.24**	-.35**	-			
9. Negative Life Change	.29**	.24**	.21**	.28**	.25**	.21**	-.41**	.24**	-		
10. Retro-priming (3.0)	-.01	.035	-.01	-.04	.014	.056	-.01	-.074	-.073	-	
11. Priming (3.0)	.15*	.11	.05	.08	.03	.10	-.01	.11	.20**	-.04	-

* P < 0.05 ; ** P < 0.01 (one tailed)

Table 3

Differences between paranormal experience groups

Scales	P-	P+	Mean	SD	U	Z	r
BQ-Sh - Total	70.45	94.00	80.60	17.40	2318	-3.19	-.25***
BQ-Sh - Unusual Experience	68.26	96.49	17.19	9.05	2129	-3.83	-.30***
BQ-Sh - Need for Order	81.43	81.58	29.11	8.90	3262	-0.20	- 0.01
BQ-Sh - Perceived Competency	79.32	83.97	16.54	5.45	3080,5	-0.63	- 0.05
BQ-Sh - Trust	82.86	76.96	12.52	4.19	3151	-0.39	- 0.03
BQ-Sh - childlikeness	70.86	93.54	12.96	3.87	2353	-3.08	- 0.24**
BQ-Sh - Sensibility	77.92	85.55	4.81	2.11	2960	-1.04	- 0.08
MHI - Total	85.05	77.49	67.80	15.46	2963	-1.02	- 0.08
MHI - Anxiety	81.30	81.73	34.66	20.38	3250,5	- 0.06	- 0.00
MHI - Depression	79.60	83.65	27.75	18.84	3104,5	- 0.55	- 0.04
MHI - Behavioral Control	79.69	83.55	23.61	18.25	3112.5	- 0.53	- 0.04
MHI - General Positive	82.14	80.78	61.26	17.52	3213	- 0.18	- 0.01
MHI - Emotional Ties	87.68	74.51	67.28	25.68	2736.5	- 1.84	- 0.14
CATS - Total	64.67	100.55	30.33	17.40	1820.5	- 4.86	- 0.38***
CATS - Negligence abuse	67.49	97.35	12.56	8.73	2063.5	- 4.05	- 0.32***
CATS - Sexual abuse	74.66	89.24	0.59	1.64	2680	- 2.88	- 0.22**
CATS - Punishment abuse	72.07	92.17	7.89	3.42	2457	- 2.74	- 0.21**
CATS - Emotional abuse	64.08	101.21	7.30	5.12	1770	- 5.04	- 0.39***
LES – Negative	71.12	93.24	6.15	6.05	2375.5	-3.01	-.24**
Retro-priming	80.12	75.68	0.01	0.09	2825.5	-.61	-.05
Priming	75.80	80.41	0.11	0.23	2818.5	-.64	-.05

* P < 0.05 ; ** P < 0.01 ; *** P < 0.001