

Long Island University

Digital Commons @ LIU

---

Selected Full Text Dissertations, 2011-

LIU Post

---

2023

## Is the Relationship Between Adverse Childhood Experiences and Adult Belief in Paranormality Moderated By Locus of Control?

Michelle Alessia Cardone M.S., M.A.

Follow this and additional works at: [https://digitalcommons.liu.edu/post\\_fultext\\_dis](https://digitalcommons.liu.edu/post_fultext_dis)



Part of the [Clinical Psychology Commons](#)

---

Michelle Alessia Cardone M.S., M.A.

**Is the Relationship Between Adverse Childhood Experiences and Adult Belief in  
Paranormality Moderated by Locus of Control?**

Doctoral Dissertation

Chair: Camilo Ortiz, Ph.D.

Committee Members: Frances Dalis, Psy.D., Linnea Mavrides, Ph.D.

Long Island University-Post Campus

### **Acknowledgments**

This dissertation would not have been possible without so many people's help, guidance, and support. A huge thank you to Dr. Ortiz who graciously stepped up to be my dissertation chair when he already had so much on his plate and helped me so much throughout this entire process. Thank you for being so patient and reassuring with my (frequent) anxiety-ridden emails about my dissertation. I would also like to thank Dr. Mavrides and Dr. Dalis who served as committee members for my dissertation and expressed genuine interest in helping me further examine this topic.

To my mom, Norma, there are not enough thanks in the world for all the love and support you've provided me throughout this dissertation process and my whole life. I genuinely appreciate everything you do for me (which is a lot!) and hope to one day repay you with an enormous glass room. To my Grandma Maria, thank you for being there through every stage of my life with tons of love, support, and delicious food. To my Grandpa Sal, I wish you were here to celebrate these milestones with me. I am so lucky I was able to spend nine years with you, and I miss you more than words can say. To my brother, Michael, thank you for always making me laugh and sharing a mutual love for odd celebrities like Corey Feldman. To my maternal aunts, uncles, and cousins (there are too many to name!) you all have provided me with so much love and support, as well as so many fond memories, and I love you all very much!

To my boyfriend, Cody, you have been my rock throughout this process and for the past eight years. You make me laugh when I want to cry and help me see the light at the end of the tunnel when I am too caught up in the darkness. I can be my truest self around you, and that is one of the biggest blessings in life. You're my best friend and I am so lucky to go on this journey of life with you- ferda! Also, a huge thank you to my boyfriend's family who immediately

welcomed me as one of their own and have been amazing sources of support and laughs for the past eight years.

My little Luna, you were my comfort buddy throughout so many distressing times and I miss you more than words can even say. I know you were there snuggling me, as you always did, throughout every difficult part of this dissertation journey.

Finally, thank you to Corey Taylor, lead singer of one of my favorite bands Slipknot, for inspiring this dissertation topic and making great music.

### **Abstract**

Research has established a relationship between adverse childhood experiences (ACEs) and belief in paranormal phenomena (Lawrence et al., 1994). In the present study, I sought to replicate this finding in more detail by examining seven dimensions of paranormality. Further, the current study investigated whether locus of control moderated the relationship between ACEs and paranormal belief. I hypothesized that ACEs positively correlated with paranormal belief. Further, I hypothesized that the relationship between ACEs and paranormal belief would be moderated by locus of control, such that, the stronger the internal locus of control, the weaker the relationship between ACEs and paranormal belief. Data in this cross-sectional, correlational study was collected using Cloud Research Connect. Participants (N = 101) completed the Adverse Childhood Experiences Survey (ACES), the Rotter's Locus of Control Scale (LCS), and the Revised Paranormal Belief Scale (RPBS). The data supported the hypothesis that ACEs positively correlated with adult belief in the paranormal. The relationship between ACEs and adult belief in the paranormal was not moderated by locus of control as hypothesized. However, ACEs were positively correlated with external locus of control, supporting findings from other studies, such as Irwin (1993), that individuals with a history of adverse childhood experiences are less likely to believe they hold control over their lives. The current study provided insight into the development of paranormal belief, as well as how ACEs can impact an individual's view of themselves and the world – each of which is important to understand when providing psychological treatment.

*Key words:* Trauma, Paranormal Beliefs, Supernatural, Adverse Childhood Experiences, Religion, Locus of Control, Cognitions, Cognitive Behavioral Therapy

### **Is the Relationship Between Adverse Childhood Experiences and Adult Belief in Paranormality Moderated by Locus of Control?**

Paranormal phenomena are anything that violate the basic principles of science (Tobacyk, 2004). Some researchers posit that paranormal beliefs are unscientific, non-religious stories about certain anomalies, which differs from Tobacyk's (2004) definition that includes traditional religious belief as a paranormal phenomenon (Betsch et al., 2020). Paranormal beliefs may be distinguished from traditional religious beliefs in several important ways. First, religion is considered "an almost universal" experience with a rich history in many cultures throughout the world (Levin, 2016, p. 1136). Pennycook et al. (2012) define traditional religious belief as "belief in beings, forces, or powers" that are not tangible and are outside the realm of an individual's daily experience (p. 335). According to a consensus done by the World Population Review (2021), approximately 85 percent of the world's population practices a religion, with Christianity (approximately 33 percent) and Islam (approximately 24 percent) being the most prevalent worldwide. Further, approximately 90 percent of the world's population holds beliefs in some form of a deity (Pennycook et al., 2012). Monotheistic belief refers to the belief in one deity, while polytheistic belief refers to the belief in multiple deities (Rea, 2006). According to Pennycook et al. (2012), theistic beliefs include a wide variety of both supernatural beliefs and religious rituals. Some researchers, such as Willard & Norenzayan (2013), posit that religious beliefs are greatly influenced by culture and cultural learning. Thus, an individual who is raised in a religious community is more likely than an individual who is not raised in a religious community to hold traditional religious beliefs and practice the rituals of their religion (Willard & Norenzayan, 2013).

Tobacyk's seven dimensions of paranormality have been widely used among researchers in this field to define and measure paranormal belief (Dean et al., 2021). For this study, Tobacyk's (2004) seven dimensions of paranormality were used to define paranormal phenomena. According to Tobacyk (2004), there are seven dimensions of paranormality including: Traditional Religious Belief, Psi (clairvoyance, telepathy, psychokinesis), Witchcraft (belief in sorcery and magic), Superstition (the belief that a particular circumstance, item, or occurrence has an ominous significance), Spiritualism (the belief that once a living being dies, their spirit survives in another dimension and can communicate with the living), Extraordinary Life Forms (the belief in extraterrestrial beings or beings such as Bigfoot), and Precognition (knowing when and how future events will occur) (Tobacyk, 2004; Zahran, 2017; Vyse, 2014, Merriam-Webster, n.d., APA, 2020).

Belief in and experience with paranormal phenomena has been documented in almost every culture throughout ancient and modern history (Ara, 2015). Some researchers hypothesize that a rise in the belief in paranormal phenomena in the United States occurred in the 1960s, citing the significant increase in the purchase of parapsychology books and Ouija boards (Ara, 2015). Williams et al. (2021) found that three out of four Americans held belief in at least one paranormal phenomenon. Dein (2012) compiled a list of surveys from various countries throughout the world and found that over half of the countries' participants reported some form of paranormal belief. Telepathy (information exchanged between multiple minds) and clairvoyance (seeing future events before they occur) were among the most prevalent paranormal beliefs in the study (Dein, 2012; Zahran, 2017).

Little work has examined the prevalence of paranormal phenomena in people without serious mental illness. Young adults tend to hold more paranormal beliefs than elderly

individuals (Irwin, 1993). However, Irwin (1993), found that in all age groups, belief in UFOs, consciousness of plants, and faith healing were relatively low. In terms of gender, women, more than men, were found to believe in almost all areas of paranormality, including psi, astrology, hauntings, psychics, reincarnation, and traditional religious concepts (Irwin, 1993). Men, on the other hand, were found, more than women, to believe in areas of paranormality such as extraordinary life forms (Irwin, 1993). No significant gender differences were found among beliefs in witchcraft (Irwin, 1993). Irwin (1993) suggests that social norms or different cognitive styles may contribute to these differences.

### **Adverse Childhood Experiences and Cognitive Functioning**

Adverse childhood experiences are potentially traumatizing events that occur in childhood. These events can include abuse (verbal, psychological, emotional, physical, and/or sexual), neglect, household dysfunction, or natural disasters (Browne & Winkelman, 2007; Felitti et al., 1998). According to the *Diagnostic and Statistical Manual of Mental Disorders -5<sup>th</sup> Edition-Text Revision* (DSM-5-TR), childhood trauma is the result of direct or indirect exposure to adverse childhood experiences (American Psychiatric Association [APA], 2022). Childhood trauma can leave a child feeling helpless and without proper coping mechanisms (Browne & Winkelman, 2007). Childhood trauma is also associated with future mental health disorders, substance abuse, and other negative consequences (De Bellis & Zisk, 2014).

According to the Centers for Disease Control (CDC) (2019), over half of the American adult population has experienced at least one adverse childhood event. Further, at least 25 percent of American adults reported having experienced three or more adverse childhood events (CDC, 2019). Adverse childhood events have a strong positive correlation with lasting trauma in adulthood (Browne & Winkelman, 2007).



It has been hypothesized that adverse childhood experiences can create a cognitive vulnerability in the individual which sensitizes them to future negative events and may lead to depression (Beck, 2008). These early adverse experiences can generate negative views and biases about the self and the external world which are cognitively organized in the form of schemas (Beck, 2008). In Beck's theory, negative schemas are strengthened by negative interpretations of events (Beck, 2008). When negative schemas are fully activated, they work automatically and are not influenced by positive life events, thus offering no opportunity for mood or symptom improvement (Beck, 2018). Instead, "attentional resources are disproportionately allocated from the external environment to the internal experiences such as negative cognitions and sadness, manifested clinically as rumination" (Beck, 2008, p. 971). Thus, even when a traumatized individual experiences positive events, they are still likely to focus on the negative. This may lead to pessimistic thinking, lack of pleasure, and depression. Further, adaptive and effective schemas, including problem-solving and healthy coping mechanisms, are depleted leaving an individual without a sense of control over themselves or their environment (Beck, 2008).

### **Adverse Childhood Experiences, Cognitive Functioning, and Paranormal Beliefs**

It is not clear why certain individuals believe in paranormal phenomena while others do not. However, the foundation and development of an individual's paranormal beliefs are complex and likely made up of various factors (Irwin, 2003). The origin of an individual's belief in and experience with the paranormal often requires a catalyst (Lawrence et al., 1994). While some researchers believe the catalyst may be cultural folklore or exposure to horror films, other researchers studying this topic hypothesize the causative factor that leads to paranormal belief is a history of one or more adverse childhood experiences (Bader et al., 2017; Lawrence et al.,

1994, p. 95). Rogers et al. (2007) suggest that adults with a history of adverse childhood experiences may lack effective coping strategies and, in turn, use paranormal beliefs to cope with their trauma. Lasikiewicz (2016) suggests that paranormal beliefs are made up of cognitive, affective, and behavioral elements that provide insight into an individual's beliefs and how these beliefs make them feel and influence their behavior. Belief in paranormal phenomena, especially superstition, is thought to increase during stressful and challenging life events (Lasikiewicz, 2016). Some individuals turn to belief in some form of paranormality as a source of comfort or escape from trauma (Irwin, 1994). Belief in paranormal phenomena may serve as an adaptive response for some individuals when they are faced with distressing situations (Lasikiewicz, 2016). Thus, when an individual feels relieved from stress or grief after turning to paranormal belief, paranormal belief is likely positively reinforced making them more likely to employ these beliefs again under similar, stress-provoking events (Lasikiewicz, 2016). According to Williams & Irwin (1991), belief in the paranormal is also positively correlated with certain behaviors such as “dogmatism, locus of control, and sensation seeking” which may be of clinical interest (p. 1339).

Further, certain researchers posit that belief in paranormal phenomena may act as “self-serving cognitive biases” that function as an explanation for unpredictable and distressing situations (Williams & Irwin, 1991, p. 1341). Hergovich (2003) also suggests that belief in paranormal phenomena may be a coping mechanism for the uncertainty of the external world. While for some people this style of coping mechanism may be interpreted as adaptive, others may interpret the use of paranormal belief as a maladaptive coping style that involves avoidance or emotion-focused coping (Lasikiewicz, 2016). Dean et al. (2021) provide a positive viewpoint of belief in paranormal phenomena by asserting that these beliefs can be linked to goal setting,

clarity of emotions, clarity of self and the world, and less fear in the presence of anomalous events. Further, certain paranormal phenomena may provide comfort to those who are grieving the loss of a loved one (Dean et al., 2021). Irwin (1993) offers further insight into individuals who hold paranormal beliefs, stating that individuals who believe in paranormal phenomena tend to be more creative and artistic than those who do not hold these beliefs.

Other researchers have examined analytic and intuitive cognitive styles associated with belief in paranormal phenomena, though the findings of research in this area are not consistent. Ross et al. (2017) define an analytic cognitive style as one in which an individual critically evaluates information before processing said information, and defines an intuitive cognitive style as unconscious, fast, and heuristic processing of information. Pennycook et al. (2013) labeled these types of cognitive styles as Type 1 processing (intuitive) and Type 2 processing (analytic) and theorized that individuals who use Type 1 processing are more likely to hold beliefs in paranormal phenomena than those who use Type 2 processing. Shenav et al. (2012) also theorized that traditional religious belief is associated with Type 1 processing. However, Irwin (2003) suggests that critical or analytical thinking styles are not less likely to be associated with paranormal belief. Instead, he suggests that a dogmatic style of thinking in which there is a great reluctance to challenge a long-held belief, may be more indicative of an individual's propensity to believe in paranormal phenomena (Irwin, 2003).

Irwin (1993) states that the cognitive style of fantasizing, or fantasy proneness, is associated with belief in the paranormal. Individuals with this cognitive style tend to spend much of their time fantasizing and preoccupied with their fantasies (Irwin, 1993). Fantasy proneness has been found to positively correlate with belief in paranormal phenomena. According to Irwin (1993), fantasy proneness may develop in part due to traumatized children using fantasies as a

form of escape from the traumatic situation. Thus, Irwin (1993) suggests that childhood trauma should be considered as an explanation or contributing factor to an individual's openness to belief in the paranormal. Further, if an individual does not have a solid basis or model for understanding novel situations or events, they are more likely to conceptualize these situations or events as being paranormal (Irwin, 1993).

Several theories exist regarding the relationships between adverse childhood experiences, locus of control, and belief in the paranormal. Often, individuals with a history of childhood trauma believe that they lack control over their lives and surrounding environment (Irwin, 1993). Williams et al. (2021) proposed that for individuals without a clinical mental disorder, belief in paranormal phenomena is representative of faulty reality testing. Within this theory, those who hold paranormal beliefs are thought to possess certain cognitive distortions such as jumping to conclusions, catastrophizing, emotional reasoning, and dichotomous thinking (Williams et al., 2021). By holding paranormal beliefs, individuals with a history of childhood trauma gain a sense of control over anomalous or uncontrollable events (Irwin, 1993). This desire for control may be maintained by the occurrence of uncontrollable events throughout the lifespan (Irwin, 1993). Thus, Irwin (1993) states that the foundations and maintenance of paranormal belief have roots in childhood trauma which leads to a need for control, which further leads to fantasy proneness, and finally leads to the illusion that the individual has control over certain life events. When belief in the paranormal allows for an individual to effectively cope with an uncontrollable event, inclination toward paranormal belief and fantasizing may be reinforced in the face of future uncontrollable or distressing situations (Irwin, 1993). Individuals who have a greater need for control over their lives may perceive more anomalous experiences as paranormal than the average person (Irwin, 1993).

Willard & Norenzayan (2013) provide three theories for the foundation and maintenance of religious belief. Anthropomorphism, according to Willard & Norenzayan (2013), is one of the most well-known theories for understanding cognitive beliefs surrounding religion. In this theory, religious individuals project human-like states onto Gods and other supernatural forces (Willard & Norenzayan, 2013). Individuals who engage in anthropomorphism tend to do so when they are lonely, in need of companionship, or in the face of uncontrollable events (Willard & Norenzayan, 2013). Dualism, according to Willard & Norenzayan (2013), refers to the belief that the mind can or cannot be related to the human body and, thus, the mind may exist outside of the human body. Willard & Norenzayan (2013) suggest that dualistic thinking is necessary for the understanding of paranormal phenomena such as ghosts and spirits. Finally, teleology refers to seeing the world and the elements that make up said world as having a set purpose (Willard & Norenzayan, 2013). In each of these theories, religion is thought to provide some form of comfort or escape from distress and grief.

Research has examined the connection between adverse childhood experiences and paranormal belief. While many of these studies are between 20 and 30 years old or only focus on specific forms of adverse childhood experiences or paranormal beliefs, they provide important insight for future research. Irwin (1992) conducted a research study with 72 undergraduate participants and found a positive correlation between the number of traumatic childhood events and paranormal beliefs. Irwin (1994) conducted a replication of this study with 121 adult participants in which he studied children of alcoholic parents (traumatic event) and paranormal beliefs. Of the 121 participants, 32 had childhood experiences in which one or more of their parents suffered from alcoholism (Irwin, 1994). Results found that compared to the 89 control participants, the 32 participants who had experienced a parent's alcoholism in childhood were

more likely than participants who did not experience this traumatic event to believe in certain paranormal phenomena such as superstition, precognition, and witchcraft (Irwin, 1994).

Another study examined the relationship between adverse parental caregiving styles and four types of adult paranormality (Rogers & Lowrie, 2018). The parental caregiving styles were rejecting, unresponsive, and intrusively overprotective (Rogers & Lowrie, 2018). Results from the study suggested rejecting and overprotective parenting styles were strong predictors of adult self-reported anomalous experiences. Further, results showed that unresponsive parenting was a predictor of more anomalous fears (Rogers & Lowrie, 2018). As with much of the research examining the link between adverse childhood experiences and adult belief in paranormality, adverse childhood experiences in this study are limited to one specific type (inadequate parenting).

Rogers et al. (2007) conducted a study examining the relationship between attachment style, loneliness, and adult paranormal belief. The study consisted of 253 participants who were administered self-report measures that included the Revised Paranormal Belief Scale (RBPS), the Child Abuse and Trauma Scale (CATS), the Creative Experiences Questionnaire (CEQ), the Social and Emotional Loneliness Scale for Adults: Short Form (SELSA-S), and the Attachment Style Questionnaire (ASQ). Rogers et al. (2007) hypothesized that “childhood trauma should be mediated by fantasy proneness which in turn should predict higher levels of paranormal belief” (p. 142). Additionally, Rogers et al. (2007) hypothesized that adult loneliness would also serve as a mediating variable on the relationship between childhood trauma and paranormal belief, such that adults with a history of childhood trauma, who also scored highly on the questionnaire measuring adult loneliness, would endorse more paranormal beliefs. The study found that participants with a history of childhood trauma were more likely than those without childhood

trauma to hold paranormal beliefs (Rogers et al., 2007). Emotionally lonely participants, defined in the study as “a perceived lack of closeness with romantic partners or family members,” were less likely to endorse paranormal belief than participants whose “loneliness derived from the physical absence of a social network” (Rogers et al., 2017, p. 157). The study also found that social loneliness acted as a moderator between childhood trauma and adult paranormal belief, such that the more loneliness endorsed by a participant, the stronger the relationship between childhood trauma and adult paranormal belief (Rogers et al., 2017). Surprisingly, results did not indicate a significant relationship between attachment style and adult belief in the paranormal, suggesting that participants with insecure, avoidant, and disorganized attachment styles were just as likely to endorse paranormal belief as participants with secure attachment styles (Rogers et al., 2017).

Perkins & Allen (2006) conducted a study in which they compared paranormal beliefs among individuals who either did or did not have a history of childhood physical abuse. On average, participants with a history of childhood physical abuse held significantly higher beliefs in areas of paranormality that included a greater locus of control (such as psi, spiritualism, witchcraft, and precognition) than individuals without a history of childhood physical abuse (Perkins & Allen, 2006). Further, participants with a history of childhood physical abuse held significantly fewer beliefs than individuals without a history of childhood physical abuse in areas of paranormality that included no locus of control (such as superstition, extraordinary life forms, and religion) (Perkins & Allen, 2006). While informative, this study only focuses on childhood physical abuse as a form of childhood trauma. A study conducted by Watt et al. (2013) found that individuals who perceived themselves as having less control in childhood were more likely to hold paranormal beliefs as adults.

In sum, the literature on adverse childhood experiences (ACEs) and paranormal belief has established a positive association between the two. Literature has also shown an association between both adverse childhood experiences and external locus of control, and external locus of control and certain paranormal beliefs. Several studies suggest that adverse childhood experiences are linked to an external locus of control and that individuals endorse paranormal beliefs to cope with the unknown, garner a sense of control over their lives, or as an escape from reality. However, no study thus far has examined the moderating effect of locus of control on the relationship between adverse childhood experiences and adult paranormal beliefs. Understanding how an individual's locus of control moderates the relationship between their adverse childhood experiences and adult paranormal beliefs could be beneficial in understanding coping mechanisms. What may be seen by some as maladaptive coping mechanisms, or even psychotic behavior (i.e., someone believing they can speak to the dead or predict the future), could be an individual's adaptive way of coping due to not learning more traditional coping mechanisms. Additionally, for individuals whose form of coping involves paranormal belief, understanding the functions of these beliefs could open the door for them to learn other coping mechanisms and deal with any trauma resulting from their adverse childhood experiences. The current study expanded upon extant research by being the first to examine the moderating effect of locus of control in the relationship between adverse childhood experiences and paranormal belief. Additionally, this study also examined the relationships between adverse childhood experiences and each of the seven dimensions of paranormal belief individually.

Several research questions and hypotheses were investigated. First, I sought to understand the relationship between adverse childhood experiences and belief in the paranormal. I hypothesized that a history of adverse childhood experiences positively correlated with a higher



endorsement of paranormal beliefs. I also hypothesized that the relationship between adverse childhood experiences and paranormal belief was moderated by locus of control, such that, the stronger the internal locus of control, the weaker the relationship between adverse childhood experiences and paranormal belief.

## **Method**

### **Participants**

101 participants were recruited through Cloud Research Connect which allows qualified participants to partake in studies for monetary compensation. For this study, participants were compensated in the form of three US dollars. There was an almost equal number of male and female participants. Of the 101 participants, most participants were White (82.2%). Most participants were either married or single, and almost half of the participants had a bachelor's degree. Additionally, most participants' annual household incomes ranged between less than \$25,000 and \$150,000.

### **Design and Procedure**

This was a nonexperimental, quantitative study using a simple cross-sectional, correlational design studying the relationship between adverse childhood experiences and paranormal beliefs. Additionally, a regression moderation analysis was done using Haye's Process add-in for SPSS. The independent variable was adverse childhood experiences, and the dependent variable was paranormal belief. The moderating variable was locus of control, such that, higher locus of control scores were hypothesized to change the strength of the relationship between adverse childhood experiences and paranormal beliefs. After signing an informed consent form, participants completed the ACES, the LCS, and RPBS. Each scale began with a set of instructions for the participants to follow. Exclusion criteria included not being a fluent

English speaker and reader, not being over the age of 18, and not living in the United States. Results were anonymously made available to the researcher on Cloud Research Connect's platform and were manually approved after ensuring participants answered all questions and submitted a completion code. Upon completion and approval, participants were awarded three US dollars. Results were then downloaded onto Microsoft Excel and transferred to Statistical Package for Social Sciences (SPSS) software for analysis.

### **Measures**

Participants received an electronic informed consent form that contained information about procedures, benefits, and risks of participating, contact information of the researcher, and contact information for psychological service hotlines and services. The study included three instruments: The Adverse Childhood Experiences Survey (ACES), the Rotter's Locus of Control Scale (LCS), and the Revised Paranormal Belief Scale (RPBS) (Tobacyk, 2004).

#### **Adverse Childhood Experiences Survey (ACES)**

The ACES, developed by the Center for Disease Control and Prevention (CDC) in the late 1990s, includes three broad types of adverse childhood experiences with each type having at least two subtypes: 1) Abuse (subtypes include physical, emotional, and sexual abuse); 2) Neglect (subtypes include physical and emotional neglect); and 3) Household dysfunction (subtypes include mental illness, incarcerated relative, mother treated violently, substance abuse, and divorce). Participants answered 10 questions asking if they experienced or were exposed to certain adverse childhood experiences before they were 18. According to Murphy et al. (2013), the ACES questionnaire has "good to excellent test-retest reliability" and is empirically supported among researchers as a valid, reliable measure (p. 4). Schmidt et al. (2018) conducted the first study in the United States that examined the validity of the ACES in comparison to

another widely used scale for childhood trauma – the Childhood Trauma Questionnaire (CTQ). Results suggested good convergent validity between ACES scores and CTQ scores across all subtypes and items. ACES scores were significantly positively correlated with CTQ scores.

### **Rotter's Locus of Control Scale (LCS)**

Rotter's Locus of Control Scale (LCS) was developed in 1966 and is a 29-item scale that measures an individual's internal versus external control. Each item contains one of two responses that either correlate to an internal or an external locus of control based on which response the individual most agrees with. Included in the 29 items are six filler items that do not factor into an individual's overall score. Scores range from 0 to 23, with lower scores indicating greater internal locus of control and higher scores indicating greater external locus of control. Scores 10 and below are considered low locus of control scores, while scores 11 and above are considered high locus of control scores (Covert & Goldstein, 1980). According to Lange & Tiggemann (2010), the LCS is a reliable and valid measure with good test-retest reliability. Marsh & Richards (1986) also found the LCS to have good construct validity, finding that there was a significant positive correlation between observer responses on the LCS and self-reports on the LCS.

### **Revised Paranormal Belief Scale (RPBS)**

The RPBS (Tobacyk, 2004) includes 26 items about paranormal beliefs which are rated on a Likert scale with scores ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). The 26 items on the scale assess for belief among the following seven dimensions: "Traditional Religious Belief, Psi, Witchcraft, Superstition, Spiritualism, Extraordinary Life Forms, and Precognition" (Tobacyk, 2004, p. 94). Each of the dimensions is scored by taking the mean of specific items that fall under the umbrella of those beliefs. For the purposes of this study, total

sums of participants' Likert Scale scores for each dimension were used for analysis. No literature was found that suggested how to calculate the overall score, with many researchers just relying on the mean scores of the seven dimensions. For the purposes of this study, the total RPBS sum was calculated by adding together all seven dimensions' sums. Total RPBS scores ranged from 29 to 161, with lower scores indicating less endorsement of paranormal belief and higher scores indicating more endorsement of paranormal belief.

The 26-item RPBS is a revision of the 25-point Paranormal Belief Scale developed by Tobacyk & Milford in 1983. The initial scale was not considered a valid procedure by certain researchers because paranormal belief was defined subjectively and did not factor in cross-cultural values (Tobayck & Milford, 1983). The 2004 RPBS developed by Tobacyk has considered these validity concerns and includes a more objective definition of paranormal belief that is more cross-culturally valid. Further, the revised items are more culturally sensitive and have less range restriction, while the scale has high reliability, cross-cultural validity, and internal validity (Tobayck, 2004).

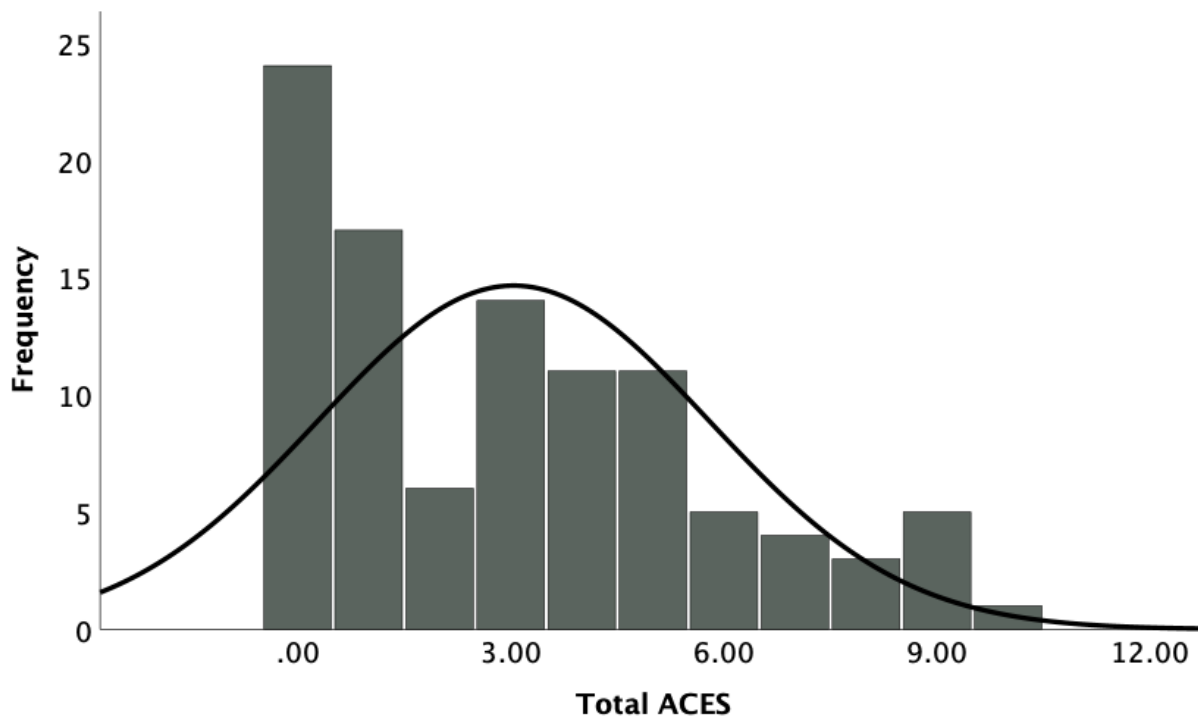
## **Results**

The distribution of the data, shown in Figure 1, for participants' scores on the ACES shows that data were skewed to the right and had a floor effect, indicating that a significant number of participants reported the lowest number of adverse childhood experiences. Scores between 0 and 3 were considered a low ACES score, while scores 4 and above were considered a high ACES score. Figure 2 showed that the data were equally distributed for participants' total locus of control scores (LOC). High LOC scores (scores above 11) indicated stronger external LOC and low LOC scores (scores 10 and below) indicated stronger internal LOC. The distribution of data for participants' total RPBS scores, as shown in Figure 3, was skewed to the

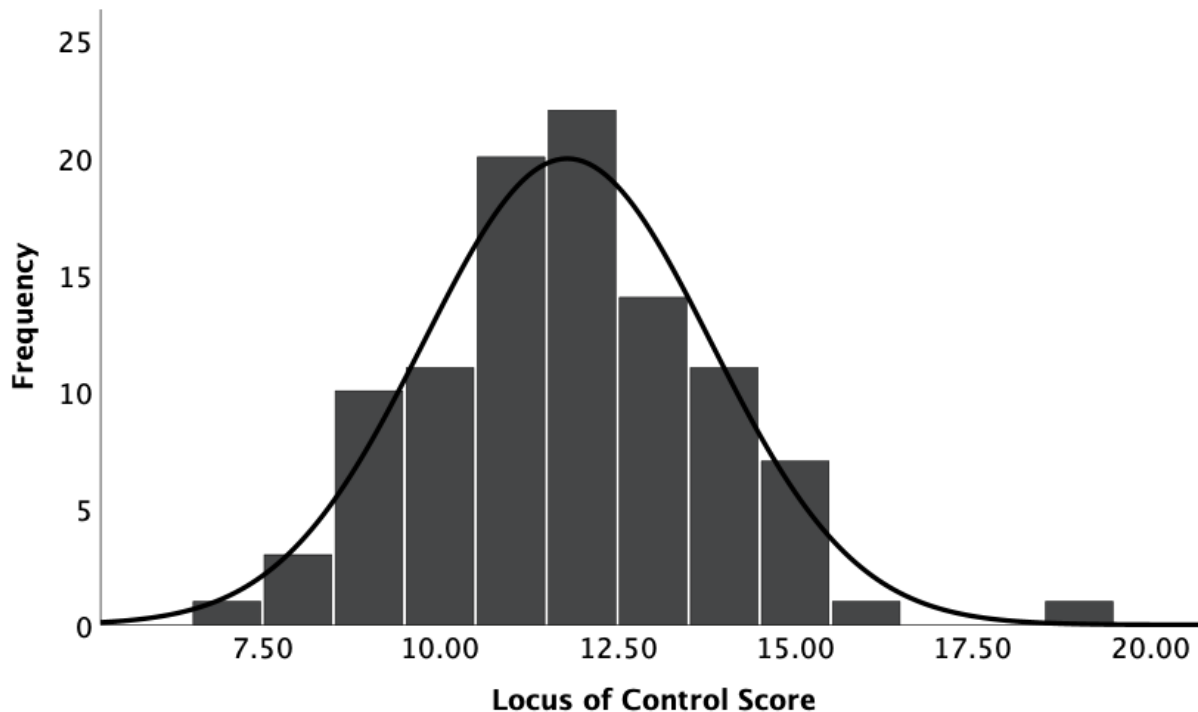
right with a moderate floor effect, indicating that a significant number of participants had lower RPBS scores.

**Figure 1**

*Total ACES Frequencies*



Pearson's correlations were run between adverse childhood experiences and locus of control, adverse childhood experiences and paranormal beliefs, and locus of control and paranormal beliefs. A statistically significant moderate positive correlation ( $r = .255$ ) was found between adverse childhood experiences and locus of control ( $p = .010$ ). A statistically significant moderate positive correlation ( $r = .204$ ) was found between adverse childhood experiences and paranormal beliefs ( $p = .041$ ).

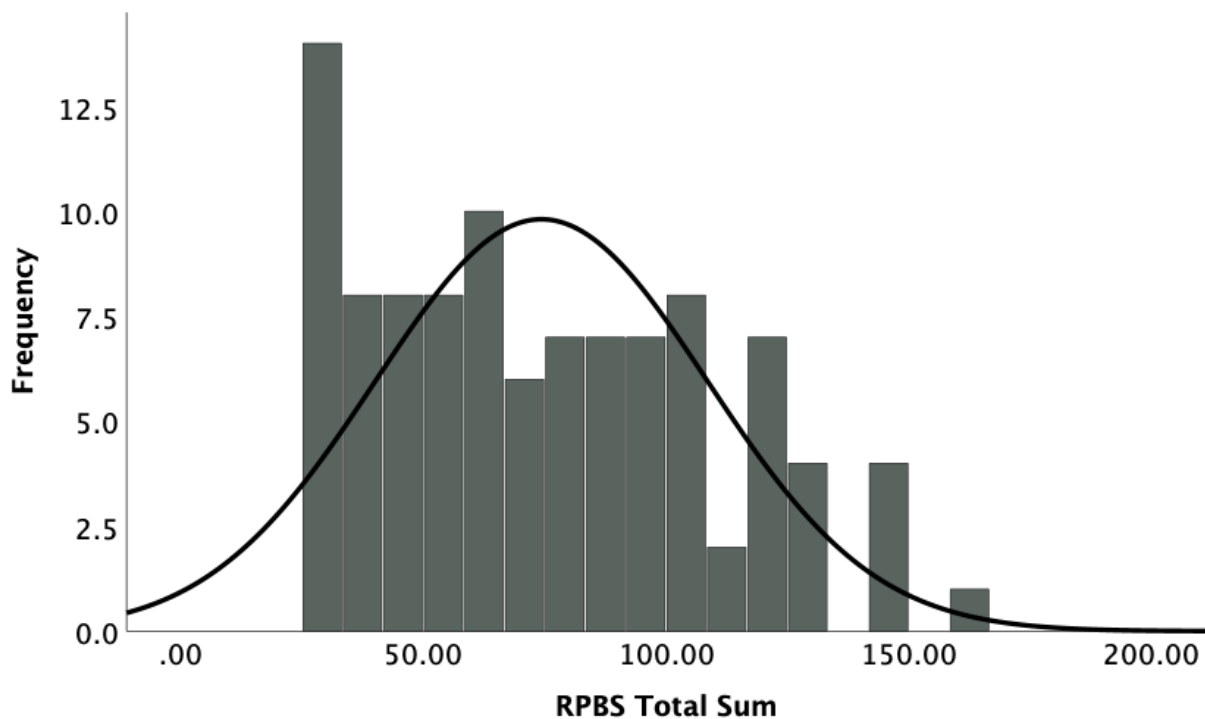
**Figure 2***Locus of Control Score Frequencies*

Pearson's correlations were also run between adverse childhood experiences and each of the seven dimensions of paranormal belief. A statistically significant positive moderate correlation ( $r = .278$ ) was found between adverse childhood experiences and belief in the Psi dimension of paranormality ( $p = .005$ ). A statistically significant moderate positive correlation ( $r = .198$ ) was also found between adverse childhood experiences and belief in the Witchcraft dimension of paranormality ( $p = .047$ ). Additionally, a statistically significant moderate positive correlation ( $r = .264$ ) was found between adverse childhood experiences and belief in the Spiritualism dimension of paranormality ( $p = .008$ ). Finally, a statistically significant moderate positive correlation ( $r = .223$ ) was found between adverse childhood experiences and belief in the Precognition dimension of paranormality ( $p = .025$ ). No statistically significant correlations were found between adverse childhood experiences and the Traditional Religious Belief, Superstition, and Extraordinary Life Forms dimensions of paranormal belief.

To evaluate if locus of control had a moderating effect on the relationship between adverse childhood experiences and paranormal belief, a moderation regression analysis was done using Hayes' Process Add-In for SPSS. Results showed that locus of control did not significantly moderate the relationship between adverse childhood experiences and paranormal beliefs. The overall model results were  $F(3,97) = 1.66$ ,  $p = .179$ ,  $R^2 = .049$ . Total adverse childhood experiences:  $b = -3.186$ ,  $t(97) = -.353$ ,  $p = .725$ . Total locus of control:  $b = -2.155$ ,  $t(97) = -.867$ ,  $p = .388$ . The interaction between the three variables (adverse childhood experiences, locus of control, and paranormal belief) was  $b = .482$ ,  $t(97) = .661$ ,  $p = .510$ .

**Figure 3**

*RPBS Total Sum Frequencies*



### Discussion

This study set out to examine whether having adverse childhood experiences was correlated with belief in the paranormal. Further, the study also sought to examine if locus of

control had a moderating effect on the relationship between adverse childhood experiences and paranormal belief, such that the stronger the internal locus of control, the weaker the relationship would be between adverse childhood experiences and paranormal belief.

The first hypothesis was supported by the data, in that total adverse childhood experiences were significantly positively correlated with paranormal belief. This corroborates existing literature that has found a positive correlation between adverse childhood experiences and paranormal beliefs. Though the reason why adverse childhood experiences and adult paranormal beliefs are correlated has not been established, many researchers have theorized on the subject. Irwin (1993) suggested that the positive correlation could be due to several factors, including using paranormal belief as a form of comfort or escape from trauma. Others, such as Brown and Winkelman (2007), suggested that adverse childhood experiences prevent individuals from developing adaptive coping skills which in turn leads to belief in the paranormal. While we may not know the causative factor in the positive correlational relationship between adverse childhood experiences and paranormal belief, existing literature in this area has consistently shown that having at least one or more adverse childhood experiences significantly correlated with adult belief in the paranormal.

When looking at the data between total ACES scores and each of the seven dimensions of paranormal belief, the hypothesis was also supported for four out of the seven dimensions of paranormality. Extraordinary life forms (ELF), superstition, and traditional religious belief were the three dimensions that did not have statistically significant correlations with total ACES. Lasikiewicz (2016) found a positive correlation between trauma and superstition. However, Lasikiewicz (2016) posited that superstitious belief was more likely to be endorsed during traumatic life events rather than as a result of traumatic life events, which offers one possible



explanation as to why adverse childhood experiences did not positively correlate with the dimension of superstition. psi, witchcraft, spiritualism, and precognition were all positively correlated with adverse childhood experiences, indicating that participants with more adverse childhood experiences were more likely to endorse paranormal beliefs that fell under each of these four dimensions. Psi, witchcraft, spiritualism, and precognition all have some degree of personal power (i.e., telekinesis, casting spells, communicating with the dead, and predicting the future). A reason for these significant, positive correlations could be that individuals with adverse childhood experiences endorsed paranormal beliefs that allow them to garner a sense of control or power in their lives and when dealing with the unknown.

Additionally, total adverse childhood experiences were also positively correlated with locus of control scores, which supported the theory in this study that endorsement of certain paranormal beliefs in individuals with a history of adverse childhood experiences was used to garner a sense of control (Irwin, 1993). This finding also supports current literature in this area that suggests that individuals with a history of adverse childhood experiences often do not feel in control of their own lives and may believe that fate and other external factors control their lives (Irwin, 1993).

Finally, the hypothesis that locus of control acted as a moderator on the relationship between adverse childhood experiences and total paranormal belief was not supported. When looking at previous literature in this area, many of the studies found that individuals with adverse childhood experiences were less likely to have an internal locus of control and more likely to have cognitive distortions and maladaptive coping mechanisms (Williams et al., 2021; Irwin, 1993). Thus, the current study hypothesized that locus of control was a moderating variable between adverse childhood experiences and paranormal belief. The purpose of examining locus

of control as a moderating variable was to see if having, or lacking, a sense of control over one's life changed the relationship between an individual's paranormal belief and their adverse childhood experiences. However, what the data in the study showed was that an individual's particular locus of control (internal or external) did not change the strength of the relationship between adverse childhood experiences and paranormal belief. This does not mean, however, that locus of control has no effect on these variables, and its relationship to both variables should be further explored in future research. It is possible that some paranormal beliefs, especially traditional religious belief as posited by Willard & Norenzayan (2013), are more ingrained into an individual's life from childhood rather than developing in adulthood which makes these beliefs less likely to be changed by other factors.

### **Limitations and Future Research**

The results should be interpreted with caution, given several important limitations. Self-report measures are somewhat controversial in research due to the possibility of participants not being truthful in their reports. Parry et al. (2021) conducted a study in which they examined the differences between self-reported and logged data for digital media usage. They reflected on past research which has posted that self-report measures are "prone to cognitive, social, and communicative biases" as well as challenges with question comprehension (Parry et al., 2021, p. 135). For their specific topic of logged versus self-reported data, they found that fewer than ten percent of self-reported measures were equivalent to the logged values (Parry et al., 2021). Participants are also generally less forthcoming with sensitive information, including topics such as adverse childhood experiences which were measured in the current study (Parry et al., 2021). If participants were not entirely truthful on self-report measures, it could have affected the accuracy and interpretation of the data. Additionally, the ACES may not account for all types of

adverse childhood experiences, such as peer bullying and rejection, low school performance, and violence in the community, which could cause an underreporting or misrepresentation of participants' ACEs (Finkelhor et al., 2013). Thus, there may be some ACEs, which were not accounted for, that could have positively correlated with certain paranormal beliefs.

Future research would benefit from further exploring other possible moderating variables on the relationship between adverse childhood experiences and paranormal belief. As Lasikiewicz (2016) posited, the time at which an adverse childhood experience occurred may play an important role in the development of paranormal belief as well as the maintenance of paranormal belief. Thus, it may be beneficial for future researchers to look further into the age at which an adverse childhood event occurred and if the individual's paranormal belief preceded the event, immediately succeeded the event, or developed over time. Knowing when the paranormal belief developed could provide a better understanding as to whether culture (i.e., being raised with religious and/or paranormal values, beliefs, or customs), negative schemas, faulty reality testing, escape from traumatic events, or a need for comfort during a period of grief are the more likely reasons for the positive correlation between adverse childhood experiences as paranormal belief (Willard & Norenzayan, 2013; Irwin 1993; Williams et al., 2021). Lasikiewicz's (2016) study posited that superstitious belief increased during adverse life events, but superstitious belief was not correlated with a history of adverse childhood experiences. However, in Irwin's (1994) study, a positive correlation between the adverse childhood experience of growing up with an alcoholic parent and superstition (as well as precognition and witchcraft). These differing data on when superstition is positively correlated with adverse childhood experiences, warrant future research to be done in this area to understand how paranormal beliefs may differ and serve different functions over time.

As discussed earlier, much of the research in this area tends to focus on one specific type of adverse childhood experience in relation to paranormal belief. Perkins & Allen's (2006) study is an important example of how one type of adverse childhood experience (physical abuse) correlates with different paranormal beliefs. Perkins & Allen (2006) found that childhood physical abuse positively correlated with psi, spiritualism, precognition, and witchcraft, each of which also positively correlated with the overall ACES score in the current study. As discussed above, Irwin (1994) also looked at one specific type of adverse childhood experience (household dysfunction by growing up with an alcoholic parent), with results indicating that this type of adverse childhood experience positively correlated with the paranormal beliefs of superstition, precognition, and witchcraft. Future research would benefit from continuing to examine each type of adverse childhood experience in relation to both broad and specific paranormal beliefs and comparing if certain paranormal beliefs are more correlated with certain adverse childhood experiences. With this knowledge, we could better understand what causes these correlations and if it has more to do with the type of adverse childhood experience or the paranormal belief.

Additionally, another possible moderator that could be of interest in future research may be enrollment in psychological treatment. As suggested by Beck (2008) and Williams et al. (2021), adverse childhood experiences can lead to cognitive distortions, negative schemas, and faulty reality testing each of which can be mitigated by psychological treatment and could influence an individual's beliefs and coping styles. If an individual is enrolled in psychological treatment and has worked on developing adaptive coping mechanisms or done a form of trauma therapy, it may impact whether they believe in paranormal phenomena. Thus, studying this further could provide more of an understanding of the function of paranormal beliefs for individuals with a history of adverse childhood experiences.

Finally, as suggested by the *DSM-5-TR*, indirect exposure to adverse childhood events can also have lasting, detrimental consequences (APA, 2022). Researchers may find it beneficial to not only examine the correlational relationship between direct adverse childhood experiences and adult paranormal beliefs but also indirect exposure to adverse childhood experiences as this has not yet been studied in this area.

### **Conclusion**

Overall, even though not all hypotheses were supported, the study provided insight into the relationship between adverse childhood experiences and adult paranormal belief. Research in this area has generally focused on specific adverse childhood experiences and/or specific paranormal beliefs. This study offered insight into the relationship between adverse childhood experiences and both overall and specific paranormal beliefs. Our study not only supported the current literature in this area but also showed that there were specific paranormal beliefs that were more positively correlated with adverse childhood experiences than other specific paranormal beliefs. This is important to better understand how these beliefs may serve as coping mechanisms for these individuals.

## References

- Abu-Raiya, H., & Pargament, K. I. (2015). Religious Coping among Diverse Religions: Commonalities and Divergencies. *Psychology of Religion and Spirituality*, 7(1), 24-33. <https://doi.org/10.1037/a0037652>
- Alcock, J., & Otis, L.P. (1980). Critical Thinking and Belief in the Paranormal. *Psychological Reports*, 46(2), 479-482. <https://doi.org/10.2466/pr0.1980.46.2.479>
- American Psychiatric Association (2022). *Diagnostic and Statistical Manual of Mental Disorders* (5<sup>th</sup> ed., text rev.). <https://doi.org/10.1176/appi.books.9780890425787>
- American Psychological Association. (July 2017). *What is Cognitive Behavioral Therapy?*. Clinical Practice Guideline for the Treatment of Posttraumatic Stress Disorder. <https://www.apa.org/ptsd-guideline/patients-and-families/cognitive-behavioral>
- American Psychological Association. (2020). Spiritualism. In *APA Dictionary of Psychology*. American Psychological Association.
- Ara, R.M. (2015). Correlation of the Religious and the Paranormal Beliefs to Personality. *The International Journal of Indian Psychology*, 2(4), 158-189.
- Bader, C.D., Baker, J.O., & Mencken, C.F. (2017). *Paranormal America: Ghost Encounters, UFO Sightings, Bigfoot Hunts, and Other Curiosities in Religion and Culture* (2<sup>nd</sup> ed.). New York University Press.
- Beck, A.T. (1963). Thinking and Depression I. Idiosyncratic Content and Cognitive Distortions. *Archives of General Psychiatry*, 9(4), 324-333. <https://doi.org/10.1001/archpsyc.1963.01720160014002>
- Beck, A.T. (1964). Thinking and Depression II. Theory and Therapy. *Archives of General Psychiatry*, 10(6), 561-571. <https://doi.org/10.1001/archpsyc.1964.01720240015003>

- Beck, A.T., Rush, A.J., Shaw, B.F., & Emery, G. (1979). *Cognitive Therapy of Depression*. New York: Guilford Press.
- Beck, A.T. (2008). The Evolution of the Cognitive Model of Depression and Its Neurobiological Correlates. *American Journal of Psychiatry*, 165(8), 969-977.
- Berkowski, M., & MacDonald, D.A. (2014). Childhood Trauma and the Development of Paranormal Beliefs. *The Journal of Nervous and Mental Disease*, 202(4), 305-312.  
<https://doi.org/10.1097/NMD.0000000000000123>
- Betsch, T., Abmann, L., & Glöckner, A. (2020). Paranormal Beliefs and Individual Differences: Story Seeking Without Reasoned Review. *Heliyon*, 6(6).  
<https://doi.org/10.1016/j.heliyon.2020.e04259>
- Brown, C., & Winkelman, C. (2007). The Effect of Childhood Trauma on Later Psychological Adjustment. *Journal of Interpersonal Violence*, 22(6), 684-697.  
<https://doi.org/10.1177/0886260507300207>
- Brysbaert, M. (2019). How Many Participants Do We Have to Include in Properly Powered Experiments? A Tutorial of Power Analysis with Reference Tables. *Journal of Cognition*, 2(1), 16. <https://doi.org/10.5334/joc.72>
- Burns, D.D. (2008). *Feeling Good: The New Mood Therapy*. Harper.
- Carver, C.S., Scheier, M.F., Weintraub, J.K. (1989). Assessing Coping Strategies: A Theoretically Based Approach. *Journal of Personality and Social Psychology*, 56(2), 267-283.
- Carver, C.S. (1997). You Want to Measure Coping but Your Protocol is Too Long: Consider the Brief-COPE. *International Journal of Behavioral Medicine*, 4(1), 92-100.

- Cooper, C., Katona, C., & Livingston, G. (2008). Validity and Reliability of the Brief-COPE in Carers of People with Dementia: The LASER-AD Study. *The Journal of Nervous and Mental Disease, 196*(11), 838-843. <https://doi.org/10.1097/NMD.0b013e31818b504c>
- Coovert, M.D., & Goldstein, M. (1980). Locus of Control as a Predictor of User's Attitude toward Computers. *Psychological Reports, 47*(3), 1167-1173. <https://doi.org/10.2466/pr0.1980.47.3f.1167>
- Dean, C.E, Akhtar, S., Gale, T.M., Irvine, K. Wiseman, R., & Laws, K.R. (2021). Development of the Paranormal and Supernatural Beliefs Scale Using Classical and Modern Test Theory. *BMC Psychology, 9*(98), 1-20. <https://doi.org/10.1186/s40359-021-00600-y>
- Dein, S. (2012). Mental Health and the Paranormal. *International Journal of Transpersonal Studies, 31*(1), 61-74.
- De Bellis, M.D., & Zisk, A. (2014). The Biological Effects of Childhood Trauma. *Child and Adolescent Psychiatric Clinics of North America, 23*(2), 185-222. <https://doi.org/10.1016/j.chc.2014.01.002>
- Felitti, V.J., Anda, R.F., Nordenberg, D., Williamson, D.F., Spitz, A.M., Edwards, V., Koss, M.P., & Marks, J.S. (1998). Relationship of Childhood Abuse and Household Dysfunction to Many Leading Causes of Death in Adults. The Adverse Childhood Experiences (ACES) Study. *American Journal of Preventative Medicine, 14*(4), 245-258. [https://doi.org/10.1016/s0749-3797\(98\)00017-8](https://doi.org/10.1016/s0749-3797(98)00017-8)
- Finkelhor, D., Shattuck, A., & Turner, H. (2013). Improving the Adverse Childhood Experiences Study Scale. *JAMA Pediatrics, 167*(1), 70-75. doi:10.1001/jamapediatrics.2013.420



Hergovich, A. (2003). Field Dependence, Suggestibility and Belief in Paranormal Phenomena.

*Personality and Individual Differences*, 34(2), 195-209. [https://doi.org/10.1016/S0191-8869\(02\)00022-3](https://doi.org/10.1016/S0191-8869(02)00022-3)

Irwin, H J. (1992). Origins and Functions of Paranormal Belief: The Role of Childhood Trauma and Interpersonal Control. *Journal of the American Society for Psychological Research*, 86(3), 199-208.

Irwin, H.J. (1993). Belief in Paranormal: A Review of the Empirical Literature. *The Journal of American Society for Psychological Research*, 87(1), 1-40.

Irwin, H.J. (1994). Childhood Trauma and the Origins of Paranormal Belief: A Constructive Replication. *Psychological Reports*, 74(1) 107-111.

Irwin, H.J. (2003). Reality Testing and the Formation of Paranormal Beliefs. *European Journal of Parapsychology*, 18, 15-28.

Irwin, H.J., Dagnall, N., & Drinkwater, K. (2012). Paranormal Beliefs and Cognitive Processes Underlying the Formation of Delusions. *Australian Journal of Parapsychology*, 12(2), 107-126.

Lange, R.V., & Tiggemann, M. (2010). Dimensionality and Reliability of the Rotter I-E Locus of Control Scale. *Journal of Personality Assessment*, 45(4), 398-406.

[https://doi.org/10.1207/s15327752jpa4504\\_9](https://doi.org/10.1207/s15327752jpa4504_9)

Lasikiewicz, N. (2016). Perceived Stress, Thinking Style, and Paranormal Belief. *Imagination, Cognition, and Personality*, 35, 306-320. <https://doi.org/10.1177/0276236615595325>

Lawrence, T., Edwards C., Barraclough, N., Church, S., & Hetherington, F. (1994). Modeling Childhood Causes of Paranormal Belief and Experience: Childhood Trauma and Fantasy. *Individual Differences*, 19(2), 209-215. [https://doi.org/10.1016/S0191-8869\(95\)00034-8](https://doi.org/10.1016/S0191-8869(95)00034-8).

- Levin, J. (2016). Prevalence and Religious Predictors of Healing Prayer Use in the USA: Findings from the Baylor Religion Survey. *Journal of Religion and Health, 55*(4), 1136-1158. <https://doi.org/10.1007/s10943-016-0240-9>.
- Luhrmann, T. M. (2020). *How God Becomes Real: Kindling the Presence of Invisible Others*. Princeton University Press.
- Majima, Y. (2015). Belief in Pseudoscience, Cognitive Style and Science Literacy. *Applied Cognitive Psychology, 29*(4), 552-559. <https://doi.org/10.1002/acp.3136>
- Mann, R.E., & Beech, A. (2003). Cognitive Distortions, Schemas, and Implicit Theories. In T. Ward, D.R. Laws, & S.M. Hudson (Eds.), *Sexual Deviance: Issues and Controversies* (pp. 135-150). Sage Publications, Inc.
- Marsh, H.W. & Richards, G.E. (1986). The Rotter Locus of Control Scale: The Comparison of Alternate Response Formats and Implications for Reliability, Validity, and Dimensionality. *Journal of Research in Personality, 20*(4), 509-528. [https://doi.org/10.1016/0092-6566\(86\)90129-7](https://doi.org/10.1016/0092-6566(86)90129-7)
- Messer, W.S., & Griggs, R.A. (1989). Student Belief and Involvement in the Paranormal and Performance in Introductory Psychology. *Teaching of Psychology, 16*(4), 187-191. [https://doi.org/10.1207/s15328023top1604\\_4](https://doi.org/10.1207/s15328023top1604_4)
- Merriam-Webster. (n.d.) Witchcraft. In *Merriam-Webster.com dictionary*. Retrieved October 25, 2021, from <https://www.merriam-webster.com/dictionary/witchcraft>.
- Murphy, A., Steele, M., Dube, S.R., Bate, J., Bonuck, K., Meissner, P., Goldman, H., & Steele, H. (2013). Adverse Childhood Experiences (ACES) Questionnaire and Adult Attachment Interview (AAI): Implications for Parent Child Relationships. *Child Abuse and Neglect, 38*(2), 224-233. <https://doi.org/10.1016/j.chiabu.2013.09.004>

- Orenstein, A. (2002). Religion and Paranormal Belief. *Journal for the Scientific Study of Religion*, 41(2), 301-311. <https://doi.org/10.1111/1468-5906.00118>
- Pargament, K. I. (1997). *The Psychology of Religion and Coping: Theory, Research, and Practice*. The Guilford Press.
- Park, C. (2010). Making Sense of the Meaning Literature: An Integrative Review of Meaning Making and its Effects on Adjustment to Stressful Life Events. *Psychological Bulletin*, 136(2), 257-301. <https://doi.org/10.1037/a0018301>
- Parry, D.A., Davidson, B.I., Sewall, C.J., Fisher, J.T., Mieczkowski, H., & Quintana, D.S. (2021). A Systematic Review and Meta-Analysis of Discrepancies between Logged and Self-Reported Digital Media Use. *Nature Human Behavior*, 5, 1535-1547. <https://doi.org/10.1038/s41562-021-01117-5>
- Pechey, R., & Halligan, P. (2011). The Prevalence of Delusion-Like Beliefs Relative to Sociocultural Beliefs in the General Population. *Psychopathology*, 44, 106-115. <https://doi.org/10.1159/000319788>
- 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.
- Pennycook, G., Cheyne, J.A., Barr, N., Koehler, D.J., & Fugelsang, J.A. (2013). Cognitive Style and Religiosity: The Role of Conflict Detection. *Memory & Cognition*, 41, 1-10. <https://doi.org/10.3758/s13421-013-0340-7>
- 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. <https://doi.org/10.1097/01.nmd.00000217832.85665.c5>

- Rabeyron, T., & Watt, C. (2010). Paranormal Experiences, Mental Health and Mental Boundaries, and Psi. *Personality and Individual Differences, 48*, 487-492.
- Rea, M.C. (2006). Polytheism and Christian Belief. *The Journal of Theological Studies, 57*(1), 133-148. <https://doi.org/10.1093/jts/flj007>
- Rogers, P., Qualter, P., & Phelps, G. (2007). The Mediating and Moderating Effects of Loneliness and Attachment Style on Belief in the Paranormal. *European Journal of Parapsychology, 22*(2), 138-165.
- Rogers, P., & Lowrie, E.L. (2018). Predicting Facets of Adult Paranormality From Childhood Exposure to Inappropriate Styles of Parenting. *Imagination, Cognition, and Personality, 38*(2), 139-172. <https://doi.org/10.1177/0276236618757207>
- Ross, R.M., Hartig, B., & McKay, R. (2017). Analytic Cognitive Style Predicts Paranormal Explanations of Anomalous Experiences but Not the Experiences Themselves: Implications for Cognitive Theories of Delusions. *Journal of Behavior Therapy and Experimental Psychology, 56*, 90-96. <https://doi.org/10.1016/j.jbtep.2016.08.018>
- Rotter, J.B. (1966). Generalized Expectancies for Internal versus External Locus of Control of Reinforcement. *Psychological Monographs: General and Applied, 80*(1), 1.
- Rotter, J.B. (1990). Internal Versus External Control of Reinforcement: A Case History of a Variable. *American Psychologist, 45*(4), 489-493.
- Sar, V., Alioglu, F., & Akyuz, G. (2014). Experiences of possession and paranormal phenomena among women in the general population: Are they related to traumatic stress and dissociation? *Journal of Trauma and Dissociation, 15*(3), 303-318. <https://doi.org/10.1080/15299732.2013.849321>

- Schmidt, M.R., Narayan, A.J., Atzl, V.M., Rivera, L.M., & Liberman, A.F. (2018). Childhood Maltreatment on the Adverse Childhood Experiences (ACEs) Scale versus the Childhood Trauma Questionnaire in a Perinatal Sample. *Journal of Aggression, Maltreatment & Trauma, 29*(1), 38-56. <https://doi.org/10.1080/10926771.2018.1524806>
- Shenav, A., Rand, D. G., & Greene, J.D. (2012). Divine Intuition: Cognitive Style Influences Belief in God. *Journal of Experimental Psychology: General, 141*(3), 423-428. <https://doi.org/10.1037/a0025391>
- Skinner, B.F. (1948). 'Superstition' in the Pigeon. *Journal of Experimental Psychology, 38*, 168-172.
- Tobacyk J.J., & Milford, G. (1983). Belief in Paranormal Phenomena: Assessment Instrument Development and Implications for Personality Functioning. *Journal of Personality and Social Psychology, 44*(5), 1029-1037.
- Tobacyk, J.J. (2004). A Revised Paranormal Belief Scale. *The International Journal of Transpersonal Studies, 23*.
- Torralba, J., Oviedo L., & Canteras, M. (2021). Religious Coping in Adolescence: New Evidence and Relevance. *Humanities and Social Sciences Communications, 8*(121), 1-9.
- Vyse, S. A. (2017). *Believing in Magic: The Psychology of Superstition* (Updated Edition). Oxford University Press.
- Watt, C., Watson, S., & Wilson, L. (2013). 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. <https://doi.org/10.1016/j.paid.2006.07.015>

- Willard, A.K., & Norenzayan, A. (2013). Cognitive Biases Explain Religious Belief, Paranormal Belief, and Belief in Life's Purpose. *Cognition*, *129*, 379-391.  
<https://doi.org/10.1016/j.cognition.2013.07.016>
- Williams, C., Denovan, A., Drinkwater, K., & Dagnall, N. (2021). Thinking Style and Paranormal Belief: The Role of Cognitive Biases. *Imagination, Cognition and Personality*, 1-25. <https://doi.org/10.1177/02762366211036435>
- Williams, L.M., & Irwin, H.I. (1991). A Study of Paranormal Belief, Magical Ideation as an Index of Schizotypy and Cognitive Style. *Personality and Individual Differences*, *12*(12), 1339-1348. [https://doi.org/10.1016/0191-8869\(91\)90210-3](https://doi.org/10.1016/0191-8869(91)90210-3)
- World Population Review. (2021). *Religion by Country 2021*. World Population Review.  
<https://worldpopulationreview.com/country-rankings/religion-by-country>.
- Zahran, S.K. (2017). What is Psi? From Anti-Parapsychology to Psi as a Next Scientific Revolution: Theoretical Reviews and Hypothesized Vision. *American Journal of Applied Psychology*, *5*(2), 33-44. <https://doi.org/10.12691/ajap-5-2-1>