

MAKING SENSE OF THE NONSENSICAL:
A NUANCED APPROACH TO UNWARRANTED BELIEFS AND THEIR HOLDERS

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ABSTRACT

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A strong argument can be made that we are living in a post-fact world, where misinformation and unwarranted claims litter the landscape of data readily available to the public—often resulting in tangible consequences (e.g., the mass reemergence of measles in the U.S. related to misinformation regarding the safety of vaccines). Accordingly, the current study aimed to assess the endorsement of epistemically unwarranted beliefs (EUBs)—or those displaying a failure to align with, and be logically nested under, the entirety of available fact-based knowledge (Lobato, Mendoza, Sims, & Chin, 2014)—via a novel statistical method.

Specifically, the current study investigated three domains of EUBs (i.e., conspiratorial thinking, paranormal beliefs, and pseudoscience acceptance) via Latent Profile Analysis (LPA)—a statistical technique used to identify hidden groups within continuous data (Oberski, 2016). Further, a number of potential correlates of EUBs identified within the extant literature were entered into the statistical model as a means of identifying their specific associations among observed latent profiles.

Results indicated clear differences between identified latent groups. Specifically, two distinct profiles emerged, one higher in conspiratorial, paranormal, and pseudoscientific beliefs, and the other lower. Group membership representing more robust EUB endorsement was significantly and positively associated with New Age spiritual beliefs, alternative spirituality, magical ideation, and extraversion. Additionally,

said group membership was significantly and negatively associated with an orientation toward Christian specific beliefs and the personality trait domain of antagonism.

KEY WORDS: Conspiracy theories, Paranormal beliefs, Pseudoscience acceptance, Latent profile analysis.

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CHAPTER I

Introduction and Review of Literature

A strong argument can be made that at the current time, we are living in a post-fact world, where misinformation and unwarranted claims litter the landscape of data readily available to the public. While one may argue that sound sources of information are easily accessible to anyone inclined to search them out (e.g., trusted newspapers/programs and their associated websites), there still exists an issue in that individuals' opinions of what constitutes *reliable* and *truthful* can be quite disparate, despite clear differences in information dissemination. Take for example the issue of climate change and two popular sources of cable news—Cable News Network (CNN) and Fox News. Individuals regularly receiving their daily news from CNN will likely be exposed to information and opinions more confirmatory of climate change, while those watching Fox News will more often be exposed to information and opinions more dismissive in nature. Further, viewership of these networks, respectively, is associated with either endorsement of climate change belief or climate change denial (Feldman, Maibach, Roser-Renouf, & Leiserowitz, 2012). However, is it really *just* the sources of data individuals consume, which influence their beliefs, or is there more to it? As it turns out, individuals may self-select for where their sources of information originate. Keeping in line with the aforementioned example, democrats, who are generally more inclined to agree with human-related climate change, also show a preference for CNN, while republicans, who are generally less accepting of human-related climate change, show a preference toward Fox News (Feldman et al., 2012; Kohut, Doherty, Dimock, & Keeter, 2008). Though perhaps tempting to extrapolate a theory of belief systems based solely on

self-selected sources of data or political ideology (as the consensus among the scientific community [97%] is that humans are, at least in part, responsible for climate change [Cook, et al., 2013]), a substantial body of literature paints a vastly more complex picture—much of which will be reviewed in the current study.

Before proceeding however, we must define what exactly constitutes an *unwarranted belief*. For the current study, three domains of beliefs were examined: conspiracy theories, belief in the paranormal, and pseudoscience acceptance/science denial. As will be discussed, the first portion of the current study is a basic, partial replication of Lobato, Mendoza, Sims, & Chin (2014), which found these three domains of unwarranted beliefs to be related constructs (i.e., an analysis of this claim with the present sample). In the context of the current study, *conspiracy theories* refer to the belief that multiple actors, through collusion, are responsible for events or the concealment of events from public scrutiny, through clandestine, nefarious, and sometimes criminal actions (Swami, Chamorro-Premuzic, & Furnham, 2010). The *paranormal* will be discussed in terms of core ontological¹ confusions, or beliefs about phenomena, which arise when individuals erroneously blend key features of fundamental ontological domains (i.e., physics, psychology, and/or biology; Lindeman & Aarnio, 2006). An example of one such confusion might be an individual ascribing feelings or motivation (i.e., psychology) to an inanimate object (i.e., biology). *Pseudoscience* will refer to beliefs concerning phenomena, purportedly based in science, but not actually derived using the scientific method, including those, which persist despite failing to meet

¹For the purposes of the present study, *ontology* is best defined as “a set of concepts and categories in a subject area or domain that show their properties and the relations between them” (Oxford Dictionary).

scientific evidentiary standards (Losh, Tavani, Njoroge, Wilke, & McAuley, 2003).

Lobato et al. (2014) included science denial within this domain.

Lastly, and with regard to the comprehensive classification of conspiracy theories, the paranormal, and pseudoscience as interrelated constructs, Lobato et al. (2014) utilized the term “epistemically unwarranted beliefs” (EUBs). For the purposes of the current study, this terminology was retained, as its definition is particularly relevant to the constructs of interest. Specifically, epistemic, from the Greek word *episteme*, can be translated to mean “understanding,” and was reasoned by Plato to represent “justified true belief” (Baumberger, Beisbart, & Brun, 2017, p. 1; Theaetetus, 201c–d). While arguments regarding the use of this term are beyond the scope of the present study, its use here is mainly established to signify that EUBs are not justified by available facts. Accordingly, EUBs fail to align with, and be logically nested under, the entirety of fact-based knowledge available at the time of a question or investigation and/or subsequent claim. Thus, said knowledge is not simply relative to that held by the individual(s) asserting a belief (Hansson, 2009), but rather, to the entire fund of knowledge available, even that, which must be rigorously sought out and vetted.

Considering the terms outlined above, the warrant of this study itself must be considered. Specifically, why should anyone care what others believe, even if unwarranted? Earlier, I made the claim that, perhaps, we are living in a post-fact world, where the rampant spread and endorsement of EUBs results in tangible consequences. Before determining whether this statement is more alarmist than factual, consider a simple constellation, among an entire galaxy, of unfortunate events, which have resulted from EUBs and their broader acceptance.

On December 24, 2016, Edgar M. Welch, age 28, walked into Comet Ping Pong, a pizzeria in Washington D.C., carrying a military style assault rifle, a handgun, and a folding knife. It soon came to the attention of restaurant staff that Mr. Welch was not a patron, but rather—after discharging his rifle, whilst heading to a back room hosting a child’s party—that he had entered the premises for a more ominous reason. Specifically, he had made his northward journey across state lines to investigate what he believed to be a child sex trafficking ring—which purportedly included “kill rooms, underground tunnels, Satanism, and even cannibalism”—supposedly fueled and funded by a number of the nation’s top democrat leaders at the time, including Hillary Clinton. After finding no evidence to support his beliefs, and being surrounded by law enforcement officers, Mr. Welch surrendered to authorities (Aisch, Huang, & Kang, 2016).

As odd as this case (i.e., what some have dubbed “#pizzagate”) appears, Mr. Welch was likely not acting on an idea or delusion that was self-constructed. In fact, this specific set of beliefs is traceable to a number of sources, including popular media figures, such as Alex Jones (Robb, 2017), who hosts the *Infowars* radio broadcast and website known for popularizing and propagating conspiracy theories. In fact, Alex Jones and Infowars have disseminated a number of such erroneous conspiracy beliefs, including those such as: 9/11, the Sandy Hook massacre, and the Oklahoma City and Boston Marathon bombings were all hoaxes perpetrated by the United States Government for wicked, covert causes. Further, Infowars content is widely available with online streaming and broadcast by over 160 radio stations (Hanna, 2017) to any so inclined to seek it out, or, per chance, to have their radio dial settle upon it by accident.

Additionally, it should be noted that social media platforms, such as Twitter and 4Chan, aided in spreading the “Pizza Gate” conspiracy to audiences far and wide (Robb, 2017).

In terms of the paranormal, let us take a brief moment to explore a few instances pertaining to the detriment resulting from related beliefs. First, we might consider the fate of 10-month-old Alex Hidalgo Jr., who was stabbed to death in July of 2018, in relation to his father’s belief that he was “possessed” (Ferreira, 2018). There is also Herbert and Catherine Schaible, who were convicted of killing not one, but two of their sick children as a result of their beliefs regarding the efficacy of faith healing, or that supposedly achieved via the medium of prayer (i.e., without physical, medical intervention; Dockterman, 2014). Unfortunately, these two cases are among multitudes, which involve the deaths of innocent children, directly linked to belief in the paranormal. These cases, while tragic, are only part of the overall damage that may result from these sorts of beliefs, which often lead to the most vulnerable members of society falling prey to those willing to take advantage of the desperate.

For more than 20 years, over 1.4 million people around the world, many of whom were/are suffering from physical illness, financial strain, and/or emotional vulnerability, have sent more than 200 million dollars (USD) to a person they believed to be a French psychic named Maria Duval. These individuals were reported to have received handwritten letters promising financial stability and wealth, cures for debilitating diseases (e.g., Alzheimer’s disease), and redemption from other misfortunes in exchange for a fee (i.e., generally an ongoing payment). Unsurprisingly, in an overwhelming majority of these cases, not only did diseases maintain their downward trajectories, but also, many individuals fell into drastic debt, as they sent major portions of their monthly income to

sources they believed to be Ms. Duval—a woman they trusted could use paranormal powers to aid in their lives' difficulties (e.g., via predicting lottery numbers). Despite multinational investigations, the actors behind this case, capitalizing on both the desperate and those who believe in the power of the paranormal, have faced no criminal consequences for one of the largest mail fraud cases in history, impacting 60 times the number of victims than did the ponzi scheme perpetrated by Bernie Madoff (Ellis & Hicken, 2016).

In terms of pseudoscience acceptance and potential real-world consequences, we might first consider the practice of homeopathy. According to the National Institute of Health (2018), this supposed medical practice involves two chief assertions, which are uniquely discordant with established, scientifically sound medical practices. The first “law” of homeopathy involves the notion that “like cures like,” or that substances (e.g., deadly nightshade), which cause adverse symptoms in healthy individuals, cure similar symptoms caused by organic illness. The second is the “law of minimum dose,” which states that as the dose of a homeopathic remedy decreases (i.e., via dilution), its efficacy in curing illness increases. In many cases, such a high degree of dilution occurs that the supposed active ingredient is no longer detectable in the “medication” (National Institute of Health, 2018). Additionally, the U.S. Food and Drug Administration (FDA), despite their own assertion that said substances “may not meet modern standards for safety, effectiveness, and quality,” regulates none of these alleged remedies, which are readily found next to legitimate medications in local pharmacies. These erroneous beliefs regarding the efficacy of homeopathic treatments and a lack of federal regulation have

led many individuals, including children, to experience medical complications or even death as a result of pseudoscience acceptance/science denial (McGinley, 2017).

In considering the acceptance of pseudoscience itself, especially in the U.S., it is of note that on May 4, 2018, president Donald J. Trump announced his intention to appoint Dr. Mehmet Oz—best known for his daytime talk-show, *The Dr. Oz Show*—to the President’s Council on Sports, Fitness and Nutrition. This council is housed in the Department of Health and Human Services (Foran, 2018) and has a core mission to “engage, educate, and empower all Americans to adopt a healthy lifestyle that includes regular physical activity and good nutrition” (HHS, 2017). While some may have no qualms with a medical doctor joining such a council, there has been an outcry from many in the academic and medical community over a specific concern: Dr. Oz, via his television program, has marketed a number of pseudoscientific treatments for ailments, including homeopathy, “magic” weight loss cures, and Reiki healing (Brodwin, 2015). A study published by the British Medical Journal (Korownyk et al., 2014) found only 46% of Dr. Oz’s recommendations (i.e., made via his television program) were backed by *any* scientific merit. Thus, the majority of his medical recommendations fall under rubric of pseudoscience. The case of Dr. Oz highlights an additional problem, which might prove alarming to those immersed in academia, which view their institutions as immune to decision making based on EUBs. Specifically, while many have spoken out against Dr. Oz’s scientifically unwarranted medical recommendations, including a number of prominent physicians (Goldschmidt, 2015), he retains a high-level position at a prestigious institution—Director of the Integrative Medicine program in the Department

of Surgery at the Columbia University College of Physicians and Surgery (Columbia University Department of Surgery, 2018).

Of note, the examples provided are limited only for the purposes of brevity. In fact, the prevalence of EUBs is quite high, with some findings suggesting that approximately half of all Americans reliably endorse belief in at least one conspiracy theory (Oliver & Wood, 2014). Additionally, a Gallup poll in 2005 showed that approximately three out of every four Americans express some level of belief in paranormal phenomena, some of which include pseudoscientific elements (Moore, 2005). The strongest held beliefs were in relation to extrasensory perception (ESP), with a whopping 41% of participants endorsing belief in this supposed phenomenon. Telepathy came in second with 31%, while Astrology came in third with 25%. Notably, only 27% of respondents did not endorse any belief in the 10 items polled. Interestingly, polls have shown some change in attitudes, with Gallup reporting that similar polls, given in 1990 and again in 2001, showed a significant increase in paranormal/pseudoscientific beliefs, with the change from 2001 to 2005 being less significant (Newport & Strausberg, 2001; Moore, 2005). Given these findings, it is apparent that EUBs need serious examination, as they are pervasive components of the belief systems of a large portion of Americans.

While the examples above and their relations to EUBs may appear somewhat disparate in nature, they do share a common thread. In short, these domains are often quite difficult to differentiate because they often rely upon one another to thrive (Lobato et al., 2014). For example, some conspiracy theories include paranormal assertions as core to their claims (e.g., extraterrestrials have visited Earth but government operatives consistently hide this truth from citizens). Further, some forms of pseudoscience/science

denial utilize conspiracy theories in attempting to avoid being debunked by sound scientific evidence or reasoning (e.g., the earth is flat and all evidence to suggest otherwise [photos, etc.] has been developed by government players in an elaborate cover-up). Additionally, pseudoscience and the paranormal can be especially difficult to differentiate (e.g., “spiritual healing” contains both components of the paranormal and pseudoscience, though it may be argued as falling further along the paranormal continuum), highlighting a quandary with regard to the strict demarcation between EUB domains. Of note, it is also important to remember that not *all* conspiracy theories are bogus (e.g., “big tobacco” covering up the harm caused by cigarette smoking for a number of years; Cummings, Brown, & O'Connor, 2007). Further, not *all* claims made by science or scientists are accurate (e.g., Einstein initially rejected the model of the dynamic universe in favor of a static model; Nussbaumer, 2014). While some might say these examples prove we are unable to distinguish EUBs from truths, we need not necessarily throw our hands up in defeat. One helpful idea to consider is that of the *false continuum*. As Novella (2013) points out, a common logical fallacy is to assume that because there is no strict boundary between two extremes, many individuals will claim the difference between the two is either illusory or unimportant (e.g., between science and pseudoscience). For example, within the field of psychology, many argue about the merits of psychoanalysis. In this specific case, an argument can be made that psychoanalysis is more pseudoscientific than scientific; its tenets are not falsifiable and cannot be evaluated using the scientific method. At the same time, many also recognize Sigmund Freud’s contributions to the field (e.g., the importance of early experiences and the notion of nonobvious reasons for behavior). However this potentially fuzzy boundary

does not make all such distinctions as murky (e.g., there is no scientific evidence to seriously suggest the earth is flat). However, confusion with regard to unwarranted beliefs still abounds.

Though many researchers have attempted to uncover factors associated with EUBs, a majority of research findings are mixed. One explanation for these inconsistent findings is that research has generally failed to account for differences among people who endorse EUBs. That is, it is possible that quite disparate groups of individuals with varying individual differences may endorse EUBs within the same domain. Accordingly, correlates of these beliefs may vary among these groups—an issue addressed by the current study. However, before going further, factors previously analyzed, with respect to EUBs must be considered.

As noted, the first portion of the current study will be a basic, partial replication of the Lobato et al.'s (2014) study, which found a positive association between the three domains of EUBs discussed. Specifically, their findings suggested that when individuals endorse belief in one EUB domain, they tend to endorse belief in the others. Accordingly, to investigate a more nuanced relationship between EUBs and their holders, we must first assess the relationship between the domains of EUBs themselves and discuss findings related to their previously uncovered correlates.

Variables Associated with Epistemically Unwarranted Beliefs

Gender. As with many of the individual disparities to be discussed, gender has provided mixed findings with regard to its association with EUBs. With respect to conspiratorial thinking, some studies have found women endorse conspiracies at a marginally higher rate than men (e.g., Bruder, Haffke, Neave, Nouripanah & Imhoff,

2013; Stempel, Hargrove & Stempel III, G. 2007), while others have found no such connection (e.g., Bogart & Thorburn, 2005; Ross, Essien, & Torres, 2006). Most studies, however, do not examine the *same* conspiracy beliefs, which might help explain these discrepancies. In the context of paranormal claims, multiple studies have also found mixed results, with some indicating that women are more likely to endorse paranormal beliefs (e.g., Irwin, 1993; Lobato et al. 2014), while Aarnio & Lindeman (2005) found gender differences negligible after accounting for thinking styles (i.e. intuitive versus analytical). With regard to pseudoscience, there is also no consensus with respect to the influence of gender. For example, Johnson & Pigliucci (2004) found no gender differences in overall belief in pseudoscience, while a search of the literature found only one study (Astin, 1998), whose findings suggest women are more likely to believe in medical pseudoscience, relative to men.

Religiosity and Spirituality. Before exploring the role of religiosity and spirituality in the context of EUBs, it is important to discuss the two terms. First, it is worth mentioning that there is no agreed upon operational definition for these concepts. Further, individuals may logically disagree with respect to the degree to which religiosity and spirituality are actually distinguishable from one another (King & Crowther, 2004). Accordingly, these constructs were not be examined as mutually exclusive at a general level—as individuals may describe themselves as religious *and* spiritual, spiritual, but not religious, and so on. However, in addition to assessing religiosity and spirituality in a more general sense (i.e., either as adhering to formal dogma and practices, or representing a more personal journey not necessarily constrained to the tenets of a formal

religion, respectively), the current study also aimed to parse out the influence of New Age spirituality and its potential association with EUB endorsement.

Donahue (1999) found that supernaturally related beliefs—commonly found within New Age frameworks (e.g., astrology and speaking with the dead)—were infrequent among a nationwide sample of six Protestant Christian denominations. However, other attitudinal related beliefs (e.g., human nature is inherently good or that all spiritual wisdom resides within individuals) were endorsed at a significantly higher rate (i.e., around 30% of respondents). Accordingly, while traditional religiosity and more general spirituality may share some common elements, there appear to be more notable differences when examining spirituality that encompasses less traditional, supernatural elements (e.g., healing crystals). Given these differences, the following serves as a brief review of the extant literature concerning EUBs, as they relate to more traditional religiosity/general spirituality and New Age spirituality.

With regard to conspiratorial thinking, research is limited in the context of religiosity, more traditional spirituality, and New Age beliefs—signaling a need for more research in this specific area. However, Newheiser, Farias, & Tausch (2011), found that those identifying as New Age spiritual were more likely to endorse belief in a specific conspiracy (i.e., in their study, related to the Da Vinci Code), while they found an inverse relationship among those who identified as traditionally religious Christians. Further, for those more traditionally religious, the presentation of counterevidence actually decreased conspiratorial thinking. With regard to paranormal beliefs, evidence is also mixed. Some researchers have found results supporting the notion that traditional religiosity is *not* strongly associated with paranormal beliefs (e.g., Emmons & Sobal, 1981; Rice, 2003)—

specifically, suggesting that when individuals hold one type of belief (i.e., traditionally religious or non-religious paranormal) they tend to reject the other (i.e., they are not congruent). However, other researchers have found a positive relationship between individuals identifying as traditionally religious and paranormal beliefs (e.g., Hergovich, Schott, & Arendasy, 2005). Interestingly, those who consider themselves “spiritual”² tend to have stronger paranormal beliefs that are not necessarily religious in nature (e.g., ESP, precognition, psychokinesis; MacDonald, 2000). Accordingly, Orenstien (2002) found that religiosity was strongly correlated to paranormal beliefs, until church attendance (i.e., a traditional religious practice) was considered; that is, attendance was negatively correlated with paranormal beliefs.

With respect to pseudoscience acceptance/science denial, Lobato et al. (2014) found a positive association between religious affiliation and said beliefs. It is important to note, however, that they did not differentiate between religious and spiritual, and further, they compared groups based on a “Christian” and “non-religious” designation. Hsiao et al. (2008) found that those identifying as spiritual³ or religious were both more likely to use religious and spiritually based pseudoscientific medical treatments than those who did not endorse any affiliation. Interestingly, they also noted those identifying as spiritual alone to be more likely to use non-religious/non-spiritual based pseudoscientific medical treatments, while those identifying as religious were more likely to engage in use of religious/spiritual based pseudoscientific medical treatments.

² Of note, McDonald (2000) characterized spirituality as consisting of five domains, one of which is *Paranormal*. However, *Religiousness* is also a domain, further lending credence to the idea that traditional religious beliefs are often held by those self-identifying as spiritual and do not necessarily represent mutual exclusivity.

³ Hsiao et al. (2009, p. 140) defined Religiosity as “formal, institutional, and outward expression of the sacred,” and spirituality as “an internal, personal, and emotional expression that arises from searching the sacred.”

Consequently, Hsiao et al. (2008) suggested that in the realm of pseudoscience, religiosity and spirituality should likely be measured as separate, if related, constructs.

Thinking Styles. For the purpose of the current study, three types of thinking styles were assessed: magical thinking, as well as two other forms, which are more closely related to one another—rational and emotional. *Magical thinking* refers to that, which includes superstitious beliefs and views of causation, generally deemed unsound by scientific principles—which is considered an indicator of schizotypy (Eckbald & Chapman, 1983). Accordingly, schizotypy has been found to have a strong, positive association with belief in conspiracy theories (Bruder, Haffke, Neave, Nouripanah, & Imhoff, 2013; Neave & Holmes, 2011). Further, magical thinking (Tobacyk & Wilkinson, 1990) and schizotypy (Hergovich, Schott, & Arendasy, 2008) are positively related to endorsement of paranormal beliefs. However, research demonstrating a relationship between magical thinking and pseudoscience acceptance is lacking, indicating a need to understand its role with respect to this EUB domain.

With regard to rational (analytical) and emotional (intuitive) thinking, findings suggest that rational thinking styles help to reduce belief in conspiracies (Swami, Voracek, Stieger, Tran, & Furnham, 2014), while individuals holding more paranormal beliefs appear to depend more on their intuitive system of thinking. Additionally, such beliefs do not appear to arise from flaws within the rational thinking system. Accordingly, rational thinking styles do not appear related to paranormal beliefs (Aarnio, & Lindeman, 2005; Epstein, Pacini, Denes Raj, & Heier, 1996; Lindeman & Aarnio, 2007; Wolfradt, Oubaid, Straube, Bischo, & Mischo, 1999). With regard to pseudoscience, there is a general lack of empirical investigation with respect to both

rational and intuitive styles of thinking. However, Majima (2015) found that in a Japanese sample, an analytical thinking style was positively associated with endorsement of non-paranormal pseudoscience beliefs. Thus, while analytical thinking may be a form of armor, with regard to EUB endorsement, it is not without its gaps and vulnerabilities.

Of note, need for cognition (NFC), or the “tendency [for individuals] to engage in and enjoy effortful cognitive activities” (Cacioppo, Petty, Feinstein, & Jarvis, 1996, p. 197), has also been studied in the context of EUBs and is sometimes considered a close correlate of a rational thinking style. While a link between NFC and conspiracy theory beliefs has been unsupported in past studies (e.g., Abalakina-Paap, Stephan, Craig, & Gregory, 1999; Lobato et al., 2014), findings related to NFC and paranormal beliefs are mixed. Specifically, while some have found support for the notion that having a higher NFC is linked with less paranormal beliefs (e.g., Lobato et al., 2014; Pennycook, Cheyne, Seli, Koehler, & Fugelsang, 2012), others have failed to observe this relationship (Genovese, 2005; Yates & Chandler, 2000). In terms of pseudoscience beliefs, there is a lack of research examining this relationship in particular, perhaps because pseudoscience and the paranormal are sometimes difficult to decipher from one another. The only study returned by a search for relevant literature, which tests this relationship, was that performed Lobato et al. (2014), in which this relation was unsupported.

Control and Uncertainty. Two different aspects of *control* have been studied in the context of EUBs: locus of control and desirability of control. *Locus of control* (LOC) refers to the degree to which an individual believes that he or she is either in control of outcomes in their life via his or her own behavior (internal LOC) or that outcomes are based on uncontrollable factors, such as luck or chance (external LOC; Rotter, 1990).

Desirability of control (DOC), however, refers to the desire or motivation to control the events that one experiences in life (Burger, 1979). While seemingly similar, the distinction in these constructs is that LOC represents a set of *beliefs*, while DOC represents potential *motivations*. Indeed, these two constructs, in the context of EUBs, have been scrutinized to varying degrees. For example, Abalakina-Paap et al. (1999) found that high levels of external LOC are positively associated with beliefs regarding the existence of conspiracies in a general sense. With regard to paranormal beliefs, many studies have found associations between high external LOC and endorsement of stronger paranormal beliefs (e.g., Irwin, 1994; Stanke, 2004). DOC, however, appears to have less research with regard to EUBs overall, and has evidenced mixed findings. For example, DOC has been found to be both positively associated with attitudes toward conspiracy theories (Lobato et al., 2014), as well as belief in the paranormal (Irwin, 2000). Still, others (e.g., Lindeman & Aarnio, 2006) have downplayed the relationship between DOC and the beliefs in the paranormal, based on their findings. A search for literature returned no results with respect to a possible relation among DOC, LOC, and pseudoscience beliefs.

In the current study, control was examined through the lens of *intolerance of uncertainty* (IU). In short, IU is related to the manner in which individuals perceive and process data when uncertainty is present (Freeston, Rhéaume, Letarte, Dugas, & Ladouceur, 1994). In such situations, individuals with a high IU tend to believe that the occurrence of an event perceived as negative is intolerable, and is also associated with higher endorsement of anxious symptoms (Carleton, Norton, & Asmundson, 2007; Dugas, Gosselin, & Ladouceur, 2001). While this area of research is limited, preliminary

findings have been useful in partly explaining conspiratorial beliefs. Specifically, Kovic, & Fuchslin (2018) found that conspiratorial beliefs appear to be a form of a cognitive bias, which is used to cope with uncertainty. In their study, it was found that the lower the probability of an event (e.g., a journalist uncovering a government conspiracy found dead in his apartment the next day of a heart attack he had a low probability of experiencing, as opposed to a high probability), the more conspiratorial individuals' explanations became. Accordingly, Kovic, & Fuchslin conceptualize such thinking as a heuristic to satisfy probabilistically problematic information (i.e., deriving conclusions that square with the likelihood of an event, thereby exerting a degree of control). In terms of the paranormal, Hart, Sullivan-Sanchez, Packer, & Loveless (2013) found IU to be positively linked with paranormal beliefs in general, and especially to those related to precognition. However, a search for literature returned no results linking IU to the endorsement of pseudoscience beliefs.

Authoritarianism. Authoritarianism is generally signified by strong support for established authority, as well as aggression toward out-groups and endorsement of traditional values, when espoused by said authorities (Whitley Jr., 1999). With regard to its relationship to EUBs, authoritarianism has evidenced mixed findings in the extant research. For example, some research has found a positive association between authoritarianism and both paranormal (Heard & Vyse, 1998) and conspiracy related beliefs (Abalakina-Paap, Stephan, Craig, & Gregory, 1999). However, authoritarianism's relationship to beliefs in conspiracies has been disputed by the findings of other researchers, who observed no such relationship (e.g., and Oliver & Wood, 2014).

Additionally, there is only limited support for a positive relationship between authoritarianism and pseudoscience beliefs (Allum, 2011).

Core Ontological Confusions. During development, individuals cultivate core ontological knowledge of the world, generally in the absence of instruction, in the domains of physics (e.g., object permanence), psychology (e.g., humans actions usually result from motivations), and biology (e.g., intuitive knowledge regarding healing processes), which aids them in understanding the environment in adaptive manners (Lindeman & Aarnio, 2007; Lindeman, Svedholm, Takada, Lönnqvist, & Verkasalo, 2011). *Core ontological confusions* refer to instances in which this knowledge goes awry. Specifically, when knowledge of one core ontological domain erroneously bleeds into another, unwarranted beliefs regarding the nature of the world and different phenomena may arise. Lindeman & Aarnio (2007) offer belief in psychokinesis as one example of one such confusion (i.e., the belief that an entity may manipulate matter via intentionality [psychology] without the influence of an external force [physics]).

Accordingly, Lindeman, Svedholm-Häkkinen, & Lipsanen (2015) found that core ontological confusions are a strong predictor of paranormal beliefs. Further, Lobato et al. (2014) found these confusions to be strongly associated with paranormal beliefs, as well as conspiracy theory beliefs. While direct evidence of core ontological confusions influencing pseudoscientific beliefs is lacking (e.g., Lobato et al., 2014), Lobato & Zimmerman (2015) found that belief in conspiracy theories and the paranormal—two domains of EUBs, which are influenced by ontological confusions—predict pseudoscience acceptance.

Personality. Personality traits and their association with EUBs have also been an

area of investigation, with a number of mixed findings. For example, and with regard to the Big Five personality traits, lower levels of agreeableness (Lobato et al., 2014) and higher levels of openness to experience (Swami, Chamorro-Premuzic, & Furnham, 2010; Swami et al., 2011) have been positively associated with conspiracy theory belief. Smith, Johnson, and Hathaway (2009) also found an association between higher levels of openness to experience and endorsement of paranormal beliefs, while Lobato et al. (2014) did not observe such a relationship. They did find, however, that being less *extraverted* contributed to less endorsement in paranormal beliefs. Similarly, a number of researchers have observed a positive relationship between extraversion and paranormal beliefs (e.g., Thalbourne, 1981: and Thalbourne and Haraldsson, 1980).

A search for literature found little with regard to the study of personality traits and pseudoscience acceptance, with no compelling association of personality factors as influencing pseudoscience endorsement (e.g., Lobato et al., 2014). Of particular importance, there appears to be a paucity of literature addressing EUBs and their association with personality from a dimensional approach (i.e., the dimensional model proposed within the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition [DSM-5]). In fact, a search for literature resulted in only one available study, which found conspiracy beliefs to be related to the Personality Inventory for the DSM-5 (PID-5) trait facets of Unusual Beliefs and Experiences and, to a smaller degree, Suspiciousness (Swami, Weis, Lay, Barron, & Furnham, 2016).

CHAPTER II

Method

Participants

A total of 372 participants were recruited for the current study. Specifically, 137 participants were recruited via Amazon's Mechanical Turk (MTurk), an online employment marketplace, which allows individuals to earn compensation in exchange for the completion of online tasks—such as surveys. A total of 235 participants were recruited through Sam Houston State University's Psychology Experimental Research Participation (PeRP) subject pool, which allows undergraduate students enrolled in psychology courses to satisfy course research requirements. Data from a total of 300 participants was retained for the current study, subsequent to screening for outliers and/or missing data necessary for analyses (i.e., missing Belief Survey data). Specifically, seven (7) participants were removed from data obtained via MTurk and sixty-five (65) participants were from data obtained via SHSU's PeRP system. For individuals participating via MTurk, compensation (i.e., 50 cents, US currency) was provided. Those participating via PeRP were granted one hour of credit to help satisfy associated course requirements, in addition to being entered into a raffle to win one of ten (i.e., \$10.00) Amazon gift cards. For study participation, individuals had to meet the requirements of being at least 18 years of age, living in the United States, and speaking English. As the present study was on-line only, no in-person contact was required. See Table 1 for participant demographics.

Table 1

Participant Demographics and Background (N = 300)

Variable	Mean (SD)	Percent
Gender		
Male		33.30
Female		66.30
Other		00.30
Age	29.23 (12.89)	
Race/Ethnicity		
Caucasian		57.70
African-American		10.70
Latino/a		23.30
Asian/Asian-American		4.70
Native American		0.70
Other		3.00

Measures

Demographics Survey. Each participant completed a researcher-generated demographics survey to provide information regarding age, gender, race/ethnicity, years of education, and other personal data.

Epistemically Unwarranted Beliefs. EUBs were assessed via the Belief Survey developed by Lobato, Mendoza, Sims, & Chin (2014). This 37-item measure comprises three subscales to evaluate individuals' beliefs regarding conspiracy theories, the paranormal, and pseudoscience acceptance/science denial. Respondents were asked to identify their agreement with each item on a 5-point scale (1= *Strongly disagree* to 5= *Strongly agree*). Lobato et al. found the complete measure to have a Chronbach's alpha of .87, whereas the reliability coefficients of the conspiracy theory, paranormal, and pseudoscience subscales were .67, .86, and .76, respectively. In the current study, the complete measure was found to have a Chronbach's alpha of .90, whereas the reliability coefficients of the conspiracy theory, paranormal, and pseudoscience subscales were .75, .89, and .71, respectively

Spirituality and Religiosity. Participants rated their level of spirituality and/or religiosity via the Spiritual and Religious Dimensions Scale (SRDS; Nasel & Haynes, 2005). The SRDS is a 35-item measure designed to differentiate between participants identifying as Christian, versus those identifying as spiritual. Respondents indicated agreement with items on a 5-point scale (0 = *Strongly Disagree* to 4 = *Strongly Agree*). Nasel and Haynes (2005) observed a two-factor structure—Christian Religiosity (14 items; alpha = .88) and Alternative Spirituality (15 items; alpha = .93). In the current study, the Christian Religiosity factor was found to have a Chronbach's alpha of .92,

whereas the Alternative Spirituality factor was found to have an alpha of .91. Six additional items contain self-identification information and one validity question (i.e., “I responded to all statements honestly”).

New Age Spirituality was measured via the 22-item New Age Orientation Scale (NAOS; Granqvist & Hagekull, 2001). The NAOS is intended to measure participants’ endorsement of interests, activities, and beliefs relevant to New Age themes, via a 6-point scale (1=*Strongly Disagree* to 6=*Strongly Agree*). The NAOS was originally found to have a Chronbach’s alpha of .95. The current study found the NAOS to have an alpha of .96.

Intolerance for Uncertainty. Intolerance for uncertainty was measured via the Intolerance for Uncertainty Scale-12 (IUS-12; Carleton, Norton, & Asmundson, 2007), a briefer version of the original IUS (Freeston, Rhéaume, Letarte, Dugas, & Ladouceur, 1994). Carleton, Norton, & Asmundson (2007) observed excellent internal consistency for the 12-item scale ($\alpha = .91$), with alphas of .85 when assessing scale scores via a two-factor structure (prospective anxiety [7 items; i.e., fear and anxiety regarding the future] and inhibitory anxiety [5 items; i.e., anxiety/uncertainty, which hinders action]). In the current study, the IUS was found to have a Chronbach’s alpha of .88. Participants were asked to rate their agreement with each item on a 5-point scale (1=*Not at all like me* to 5=*Entirely like me*), with higher scores indicating a higher intolerance for uncertainty. Of note, the anchor points for this scale were slightly altered to simplify wording (e.g., from “not at all characteristic of me” to “not at all like me”).

Magical Thinking. The Magical Ideation Scale (MIS; Eckblad, & Chapman, 1983) was used to assess participants’ endorsement of items related to schizotypy, or the

presence of mild symptoms often observed in schizophrenia. Specifically, the MIS is a 30-item questionnaire designed to assess superstitious beliefs and views of causation, generally deemed unsound by scientific principles. Eckbald and Chapman (1983) observed coefficient alphas of .82 for males and .85 for females. Participants responded “False” or “True” to each statement, with statements indicative of magical thinking coded as 0 and those not, coded as 1. Accordingly, lower scores indicate higher levels of magical thinking. The current study found the MIS to have a Chronbach’s alpha of .85.

Rational and Emotional Thinking. The Rational-Emotional Inventory (REI: Pacini & Epstein, 1999) was used to measure participants’ thinking styles (i.e., rational processing and experiential processing). The REI comprises 20 rating items, each using a 5-point scale (1= *Definitely not true of myself* to 5= *Definitely true of myself*), and provides two subscale scores. The rational subscale ($\alpha = .90$) measures the ability for, and engagement in, rational thinking—which is also an adaptation of Cacioppo & Petty’s (1982) Need for Cognition scale. The experiential subscale ($\alpha = .87$) measures ability and preference for experiential thinking (Pacini & Epstein, 1999). The current study found the Rational scale to have an alpha of .89, while the Experiential scale evidenced an alpha of .87.

Authoritarianism. Authoritarian attitudes were measured via the Right-Wing Authoritarian Scale—Short Version (RWA—S; Zakrisson, 2005; adapted from Altemeyer, 1996). Participants endorsed their agreement with each item on a 7-point scale (1= *Strongly Disagree* to 7= *Strongly Agree*), with higher scores indicating more authoritarian attitudes. Zakrisson (2005) observed Chronbach’s alphas between .72 and .80 for this measure in three different samples. The Current study found the RWA to have

a Chronbach's alpha of .83.

Core Ontological Confusions. Core ontological confusions were assessed via the CORE scale (Lindeman, Svedholm-Häkkinen, & Riekkö; $\alpha = .93$), which was slightly modified for the current study with regard to phrasing (i.e., the original scale was translated from Finnish to English). The current study also found the CORE to have an alpha of .93. The CORE comprises 31-items examining disparate facets of ontological confusions (e.g., lifeless objects having the attributes of animate organisms). Participants were first presented with an example of a literal statement, followed by one metaphorical in nature to clearly demarcate the difference between the two. Participants were then presented with the 31-items in random order and asked to endorse whether they were *literally true* or *not literally true* (i.e., endorsing a metaphorical statement as literally true was considered a confusion). The scale also includes eight filler items, which comprise four literally true statements and four metaphorically true statements.

Personality. Personality factors were assessed in terms of both non-pathological and pathological traits. Non-pathological personality traits were measured using the Five-Factor Model Rating Form (FFMRM; Mullins-Sweatt, Jamerson, Samuel, Olson, & Widiger, 2006). The FFMRF is a 30-item self-rating form, with each personality domain (e.g., Agreeableness versus Antagonism) consisting of six items, which each measure different facets of said domains. Specifically, the measure provides both the name of each facet measured, as well as descriptors of the facet at its poles. For example, under the facet of *Compliance*, the descriptors accompanying the higher end of the pole (i.e., higher on compliance) include “docile and cooperative,” while descriptors at the lower end of the pole include “oppositional, combative, and aggressive.” Participants were

asked to respond to each item on a 5-point scale (5=*Extremely high*, 4=*High*, 3=*Neither high nor low*, 2=*Low*, and 1=*Extremely low*). The originators of the measure observed coefficient alphas for the domain scales at a level considered acceptable to good, especially when considering the number of items (6) measured in each domain, and that each item represents a different facet of said domains (i.e., $\alpha = .51$ (openness [O]) to $.87$ (conscientiousness [C]), across 5 studies. The current study found alphas ranging from $.61$ (openness) to $.82$ (conscientiousness).

The Personality Inventory for the DSM-5—Short Form (PID-5-SF; Maples et al., 2015)—a reduced (100) item version of the PID-5 (APA, 2013), was used to measure pathological personality traits. The PID-5 is based on a dimensional model of personality; comprising 25 trait facets nested under five broader trait domains (Antagonism, Negative Affectivity, Detachment, Disinhibition, and Psychoticism). Maples et al. (2015) found that scores from the PID-5-SF demonstrated good internal consistency (Chronbach's alphas of $.90$ for trait domains and $.83$ for the trait facets). Participants responded to each item on a 4-point scale (0= *Very False or Often False*, 1= *Sometimes or Somewhat False*, 2= *Sometimes or Somewhat True*, 3= *Very True or Often True*). For the current study, only the broader trait domains, which include items from trait facets, were analyzed. Chronbach's alphas observed follow: Antagonism ($\alpha = .94$), Negative Affect ($\alpha = .91$), Detachment ($\alpha = .90$), Disinhibition ($\alpha = .91$), and Psychoticism ($\alpha = .91$).

Procedure

Participants recruited via both MTurk and PeRP were rerouted to Qualtrics—an online service hosting a number of research related services, including surveys—to

initiate the current study's survey battery. MTurk participants, upon survey completion, entered a unique 7-digit code of their choosing into Qualtrics, which they then also entered into MTurk, in order to confirm study participation (i.e., via cross-referencing said codes) and received compensation (50 cents; US currency). The SHSU PeRP system was configured to automatically grant credit (i.e., 1 hour) upon study completion. Additionally, four quality control items were embedded throughout the survey measures, as to assure participants were validly responding to items. Three of these items explicitly asked participants to select a particular response (e.g., "select option 4"), while one item was embedded in the SRDS (i.e., "I responded to all statements honestly"). Participants who answered any of the first three questions incorrectly, or who answered the latter question as either "strongly disagree" or "disagree," were removed from the data collection process without being granted compensation or credit, as their responses indicated either random or dishonest responding, respectively, rendering their data unusable. For the current study, the only measure presented in a non-random fashion was the Demographics Survey, which was the first form completed for participant screening purposes. Participation took approximately one hour.

The Current Study and Data Analyses

The literature examining EUBs is characterized by inconsistency. Where one study finds associations between unwarranted beliefs and cognitive styles or elements of personality, another finds those same variables unrelated. The current study sought to add to this research by approaching EUBs, and the individual differences with which they may be associated, in a novel manner. Specifically, Latent Profile Analysis (LPA) was implemented to assess if groups of individuals hold discernible patterns of EUB

endorsement (e.g., do some individuals endorse more robust beliefs in one domain compared to others, etc.?), rather than treat these domains of beliefs as interchangeable constructs.

More specifically, LPA is a statistical technique used to identify hidden groups within continuous data (Oberski, 2016). That is, it can be used to classify individuals within a sample who share group membership based on homogenous responses to specific questions/measures (Schreiber, 2017). For the present study, LPA analysis was implemented using the software Mplus (Muthén & Muthén, 1998-2019) to detect groups with similar profiles of epistemically unwarranted beliefs based on participant responses to the Belief Survey (Lobato et al., 2014).

Several fit indices were considered in determining the number of latent profiles that best fit the data. The first, the Bayesian Information Criterion (BIC; Schwarz, 1978), is a fit statistic generated based on a model's proficiency in fitting data by comparing log likelihood estimates of latent classes (Tein, Coxe, & Cham, 2013). Lower BIC values indicate a better model fit (Merz & Roesch, 2011). The Sample-Size Adjusted BIC (SABIC) was also referenced to determine the best model to fit the data. Both the BIC and the SABIC include a "penalty" for the addition of parameters as sample size increases; however, the SABIC penalty is lower than that of the BIC (Kenny, 2015). Entropy, another form of model selection criteria, was also considered. The Entropy statistic describes the degree to which profiles are separated, with a higher degree of separation (i.e., generally values > 0.80) reflecting a better model solution (Muthén & Muthén, 2007; Tein, Coxe, & Cham, 2013). Additionally, the Lo–Mendell–Rubin test (LMRT; Lo, Mendell, & Rubin, 2001) and Bootstrap Likelihood Ratio Test

(BLRT; McLachlan & Peel, 2000) were used to evaluate model fit. Both tests assess potential improvement between sequential profile models and generate associated significance values (Berlin, Williams, & Parra, 2014).

Lastly, a number of specific variables (i.e., magical thinking, religiosity/spirituality/and New Age spirituality, intolerance of uncertainty, rational [including need for cognition]/emotional thinking, authoritarianism, core ontological confusions, and personality factors) were entered into the statistical model in order to examine associations between the latent profiles and variables of substantive/theoretical interest. These statistical trends are reported at the ($p < .10$), given the novel nature of LPA as a statistical method of assessing EUBs, as well as the traditional ($p < .05$) level. Further, directionality of these associations is identified by the division of the calculated estimate—in essence, a regression coefficient relating each individual factor to a dichotomous outcome representing class membership—by the standard error. In doing so, the resulting value performs as a pseudo z -test (UCLA, n.d.).

CHAPTER III

Research Questions and Hypotheses

Given that the current study utilized a novel approach to EUB analysis, the associated research questions and hypotheses were broad.

Research Question 1

Will significant differences in EUB endorsement reveal disparate groups of respondents within the data?

Hypothesis 1

It was predicted that said groups would be observed (e.g., some participants would be high in conspiratorial thinking and low on the other domains of EUBs, etc.).

Research Question 2

Will individual difference level variables (e.g., varying personality traits, authoritarian attitudes, New Age spirituality beliefs, etc.) be more associated with some identified groups than others?

Hypothesis 2

It was hypothesized said variables would be differentially associated with the disparate groups identified via LPA, which would help explain why the findings of previous research examining EUBs are largely inconsistent.

CHAPTER IV

Results

Descriptive Statistics

Table 2 provides the means and standard deviations for the Belief Scale subscales (i.e., Paranormal, Pseudoscience, and Conspiracy Theories), as well as the MIS, SRDS (i.e., Christian Religiosity and Alternative Spirituality subscales), NAOS, IU, REI (i.e., Rational and Experiential thinking subscales), RWA—S, CORE, FFMRF (i.e., Neuroticism, Extraversion, Openness, Agreeableness, Conscientiousness), and the PID-5-SF (i.e., Negative Affect, Detachment, Antagonism, Disinhibition, and Psychoticism subscales). The intercorrelations among the study variables are presented in Tables 3 and 4. Of note, while Lobato et al. (2014) found moderate to strong positive correlations among the Belief Scale subscales, the current study found these scales to correlate positively, though to a lesser extent (i.e., very weak to moderate correlations).

Latent Profile Analysis of Belief Variables

As shown in Table 5, a three-class model provided optimal fit for the data; however, only one participant was estimated to fall in the third class. Consequently, the three-class model was eliminated from consideration. As shown in the table, a two-class model demonstrated uniformly superior fit over a one-class model. For the two-class solution, class 1 comprised 119 participants (40%) and class 2 comprised 181 participants (60%) of the total sample. Therefore, the classes were fairly equally divided. Overall, Class 2 was differentiated from Class 1 with respect to greater mean scores in paranormal beliefs, conspiracy theory beliefs, and to a lesser extent, pseudoscientific beliefs (see Table 6 and Figure 1). That is, individuals with high probabilities of falling in Class 2

Table 2

Means and Standard Deviations of Study Measures

Measure	<i>M</i>	<i>SD</i>
Belief Survey—Paranormal	36.64	11.62
Belief Survey—Pseudoscience	32.71	5.34
Belief Survey—Conspiracy Theories	23.43	6.27
Magical Ideation Scale	39.92	5.89
Spiritual and Religious Dimensions Scale—Christian Religiosity	41.76	14.12
Spiritual and Religious Dimensions Scale—Alternative Spirituality	40.86	12.97
New Age Orientation Scale	64.66	24.89
Intolerance of Uncertainty	38.16	8.77
Rational-Emotional Inventory—Rational	70.24	11.80
Rational-Emotional Inventory—Experiential	66.14	10.90
Right Wing Authoritarianism Scale	51.66	14.12
CORE Scale	42.06	7.94
Five Factor Model Rating Form—Neuroticism	16.69	4.79
Five Factor Model Rating Form—Extraversion	19.28	4.27
Five Factor Model Rating Form—Openness	19.99	3.74
Five Factor Model Rating Form—Agreeableness	21.16	3.77
Five Factor Model Rating Form—Conscientiousness	21.96	4.13
PID 5-Short Form—Negative Affect	2.32	.73
PID 5-Short Form—Detachment	1.94	.65
PID 5-Short Form—Antagonism	1.77	.71
PID 5-Short Form—Disinhibition	1.98	.66
PID 5-Short Form—Psychoticism	1.95	.69

Table 3

Intercorrelations among Study Measures

Measure	1	2	3	4	5	6	7	8	9	10
1. Conspiracy Beliefs	-									
2. Paranormal Beliefs	.57*	--								
3. Pseudoscience Beliefs	.34*	.12*	--							
4. Magical Ideation	-.50*	-.69*	.08	--						
5. Christian Religiosity	.29*	.27*	.26*	.17*	-					
6. Alternative Spirituality	.38*	.58*	.07	.50*	.49*	-				
7. New Age Spirituality	.52*	.79*	.10	.67*	.23*	.70*	-			
8. Intolerance of Uncertainty	.08	.17*	-.03	.22*	.01	.10	.22*	-		
9. Rational Thinking	-.22*	-.26*	-.25*	-.34*	-.15*	-.12*	-.26*	-.29*	-	
10. Experiential Thinking	.05	.17*	-.04	.14*	.03	.16*	.22*	.04	.10	-
11. Right Wing Authoritarianism	.29*	.24*	.42*	.17*	.62*	.33*	.25*	.08	-.25*	.04
12. Core Ontological Confusions	.30*	.46*	.15*	.45*	.19*	.40*	.46*	.11	-.16*	.08
13. Neuroticism	.16*	.22*	.01	.35*	.03	.17*	.26*	.45*	-.39*	.02
14. Extraversion	.09	.16*	.04	.06	.23*	.20*	.18*	-.10	.07	.14*
15. Openness	.12*	.16*	-.04	.17*	-.15*	.14*	.29*	.08	-.05	.16*
16. Agreeableness	.06	.07	-.11	-.02	.06	-.01	.07	.18*	-.06	.17*
17. Conscientiousness	-.04	-.10	-.11	.16*	.07	-.04	-.07	.12*	.29*	.08
18. Negative Affect	.28*	.34*	.01	.44*	.08	.24*	.39*	.47*	-.39*	.07
19. Detachment	.31*	.30*	.12*	.42*	.05	.28*	.39*	.34*	-.38*	-.18*
20. Antagonism	.30*	.33*	.20*	.43*	.17*	.37*	.44*	.13*	-.29*	-.16*
21. Disinhibition	.35*	.45*	.15*	.53*	.19*	.40*	.52*	.24*	-.46*	-.09
22. Psychoticism	.44*	.51*	.11*	.64*	.15*	.51*	.60*	.25*	-.35*	-.06

(continued)

Table 4

Intercorrelations among Study Measures Continued

Measure	11	12	13	14	15	16	17	18	19	20	21
11. Right Wing Authoritarianism	-										
12. Core Ontological Confusions	.29*	-									
13. Neuroticism	.02	.09	-								
14. Extraversion	.16*	.14*	.01	-							
15. Openness	-.13*	.01	.34*	.36*	-						
16. Agreeableness	-.02	-.02	.22*	.20*	.39*	-					
17. Conscientiousness	-.01	-.04	-.09	.19*	.18*	.42*	-				
18. Negative Affect	.06	.20*	.59*	-.07	.19*	.11*	-.11*	-			
19. Detachment	.18*	.25*	.43*	-.23*	.07	-.06	-.14*	.53*	-		
20. Antagonism	.26*	.36*	.21*	.09	-.01	-.25*	-.19*	.44*	.62*	-	
21. Disinhibition	.27*	.29*	.46*	.04	.17*	-.05	-.33*	.69*	.65*	.70*	-
22. Psychoticism	.24*	.36*	.41*	.04	.16*	-.08	-.22*	.63*	.70*	.69*	.80*

* $p \leq .05$

Table 5

Model Fit Criteria for One- to Three-Class Models for the Belief Scale (n = 300)

Class	Fit Indices				
	BIC	BIC-SSA	Entropy	LMRT	BLRT
1	6163.41	6144.38			
2	5996.30	5964.59	.82	189.92*	189.92*
3	5991.95	5947.55	.91	27.16*	27.16*

Note: BIC=Bayesian Information Criterion; SSA=Sample Size Adjusted; L-M-R-T=Lo-Mendell-Rubin Likelihood Ratio Test; Values with an asterisks (*) are significant at the $p \leq .05$ level.

Table 6

Means and Variances of Class 1 and Class 2

EUB Scales	Class 1 (<i>n</i> = 119)	Class 2 (<i>n</i> = 181)
Paranormal	25.67 (56.15)	43.79 (56.15)
Pseudoscience	30.72 (25.80)	34.00 (25.80)
Conspiracy Theories	17.80 (18.51)	27.11 (18.51)

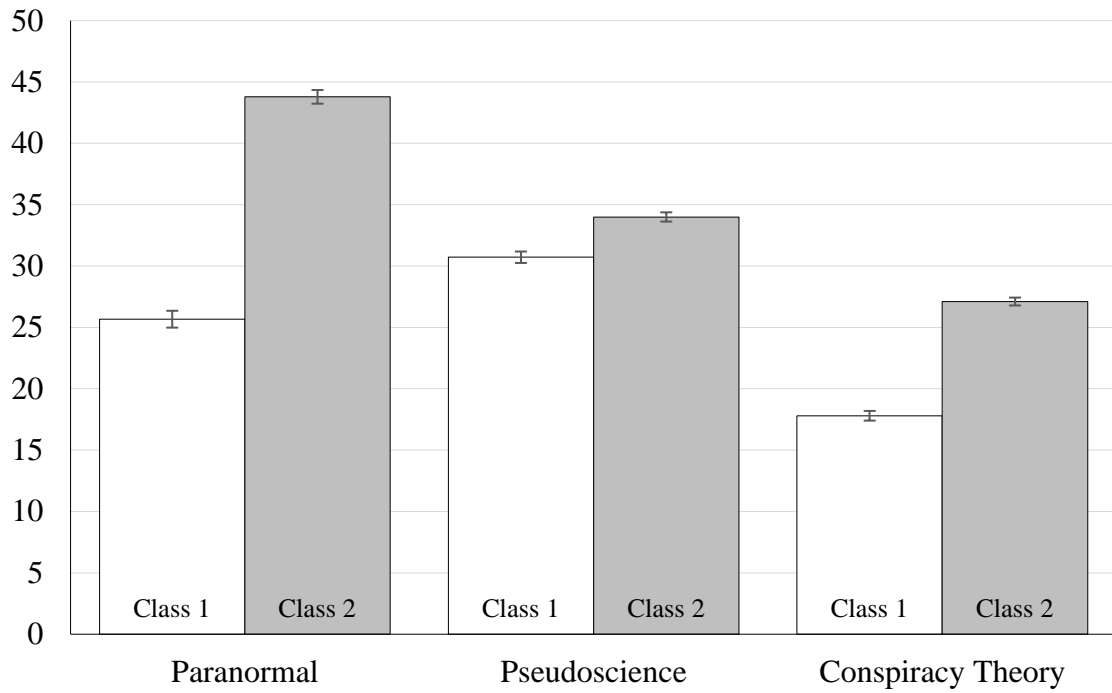


Figure 1. Means and standard error (i.e., error bars) for Class 1 and Class 2 for each EUB domain.

were observed to endorse overall higher scores on the Belief Scale, though to varying degrees with respect to the three subscales represented.

Correlates of Class Membership

When covariates were added to the two-class solution, Class 2 was differentiated from Class 1 (i.e., parameterization using reference Class 1 [p -value = .10]) by stronger positive associations with New Age spiritual beliefs, magical ideation, alternative spirituality, extraversion, and lower levels of antagonism, along with a trending negative association with Christian specific spirituality. All other covariates were assessed as non-significant (See Table 7). Of note, the directionality of the MIS is such that lower total scores indicate a higher degree of magical ideation. Thus, the negative association displayed in Table 7 is indicative of a trend toward magical ideation among members of Class 2.

Table 7

Covariates of Belief

Covariate	Estimate	SE	Pseudo-Z	<i>p</i>
New Age Orientation (NAOS)	0.16	0.05	3.406	.001
Intolerance of Uncertainty (IU)	-0.10	0.07	-1.48	.139
Magical Ideation (MIS)	-0.47	0.21	-2.25	.024
Rational Thinking (REI)	0.04	0.10	0.38	.703
Experiential Thinking (REI)	-0.03	0.03	-0.80	.423
Neuroticism (FFMR)	-0.12	0.18	-0.69	.494
Extroversion (FFMR)	0.30	0.16	1.85	.064
Openness to Experience (FFMR)	-0.09	0.14	-0.64	.508
Agreeableness (FFMR)	-0.06	0.08	-0.69	.488
Conscientiousness (FFMR)	0.02	0.15	0.16	.875
Right Wing Authoritarianism	-0.01	0.04	-0.12	.907
Christian Spirituality (SRDS)	-0.08	0.05	-1.75	.081
Alternative Spirituality (SRDS)	0.12	0.06	1.68	.093
Core Ontological Fallacies (CORE)	0.01	0.10	0.11	.915
Negative Affect (PID-5-SF)	0.95	0.97	0.98	.327
Detachment (PID-5-SF)	2.42	3.26	0.74	.458
Antagonism (PID-5-SF)	-2.06	1.22	-1.70	.090
Disinhibition (PID-5-SF)	0.74	3.50	0.21	.833
Psychoticism (PID-5-SF)	-1.01	1.92	-0.53	.599

Note. Measures in bold indicate significant associations at either the $p < .10$ or $p < .05$ level. The MIS was coded in such a way that lower scores indicate greater levels of magical thinking. Thus, the negative association shown above represents a trend toward magical ideation.

CHAPTER V

Discussion

Preliminary analysis of the current data revealed the three domains of epistemically unwarranted beliefs—conspiracy theories, paranormal beliefs, and pseudoscience acceptance—are intercorrelated, which is consistent with earlier findings (Lobato et al., 2014). However, while Lobato et al. (2014) found moderate to strong positive correlations among these belief domains, the current study found very weak to moderate correlations. One possible explanation for these differences is participant sampling. Specifically, Lobato et al. (2014) relied entirely on college undergraduates—a limitation highlighted in their work. In contrast, the current study sampled participants from both an undergraduate university sample and an online sample of individuals residing in various locations within the United States—representing more heterogeneity with respect to age, education, and other factors. Accordingly, while the current results are weaker than those observed in prior research, regarding the relationships among EUB domains, the diversity of the sample might increase the generalizability of the findings.

Univariate analyses revealed expected, as well as unexpected results regarding relationships between the Belief Scale subscales and the various factors associated with EUBs in the extant literature.⁴ One notable finding is that magical ideation is significantly (i.e., moderately) related to both conspiracy beliefs, as well as paranormal beliefs, but not to pseudoscience acceptance. This finding is consistent with previous research, which has identified strong relationships between magical thinking and conspiracy theories (e.g., Bruder, Haffke, Neave, Nouripanah, & Imhoff, 2013; Neave & Holmes, 2011), as well as

⁴ Other measures, beyond those explicitly discussed were observed as correlated with the Belief Scale subscales. However, only those rising above generally weak relationships are discussed.

paranormal beliefs (e.g., (Tobacyk & Wilkinson, 1990). Further, there is a paucity of research addressing the relation between magical thinking and pseudoscience—perhaps reflecting previous, non-significant findings akin to those in the current study, which have not been published. In the same vein, psychoticism was observed as moderately correlated with the conspiracy and paranormal subscales of the Belief Scale, while it was very weakly correlated to the pseudoscience subscale. As psychoticism and magical thinking were significantly correlated ($r = .64$), its similar relationship to the Belief Scale subscales is unsurprising. Additionally, psychoticism, in the context of the PID-5, includes elements shared by magical ideation, such as unusual beliefs and experiences (APA, 2013). Lastly, this finding supports those observed by Swami et al. (2016), which suggest that unusual beliefs and experiences are significantly associated with conspiratorial thinking.

The PID-5 trait domain of disinhibition was also noted as moderately correlated with paranormal beliefs, while it was weakly correlated to conspiracy theory beliefs and pseudoscience acceptance. While a significant association between conspiratorial thinking and disinhibition has no previous support (Swami et al., 2016), it is possible that one of the trait facets nested under disinhibition may be responsible for this relationship; namely impulsivity. Specifically, impulsivity (i.e., as measured by the PID-5) is characterized by “acting on the spur of the moment in response to immediate stimuli; acting on a momentary basis without a plan or consideration of outcomes;” and “difficulty establishing and following plans” (Krueger & Markon, 2014). Although conjecture, it is logical to consider that acting without thinking through outcomes or consequences may be associated with the impulsive acceptance of information without

taking the time to consider its veracity, even in the context of serious implications.

Additionally, New Age spirituality was positively associated with conspiracy and paranormal beliefs, though not those pseudoscientific in nature. While New Age beliefs have been found to be associated with limited conspiracy theory endorsement (e.g., Newheiser, Farias, & Tausch, 2011), there is less research addressing these beliefs in the context of the paranormal. This may be, in part, due to the trend of research blurring the lines of religion and spirituality, including New Age spirituality. Accordingly, this finding provides preliminary data suggesting a possible relationship between the two, especially in light of the fact that traditional Christian specific beliefs were not significantly associated with either scale at the univariate level. Once again, there appears to be a lack of research investigating New Age beliefs and their relationship to pseudoscience acceptance—perhaps indicating either a lack of investigation or a lack of published, non-significant findings.

Interestingly, results also indicated that right wing authoritarianism, while related to all three domains of EUBs (i.e., conspiracy theory and paranormal beliefs weakly), was most closely (i.e., moderately) related to pseudoscience acceptance/science denial. This may be due to certain aspects of this specific domain of EUB, which tend to have stronger connections to individual political views. For instance, it is not unusual for individuals holding typically right-of-center views in the U.S. to also engage in climate change denial (Whitmarsh, 2011). Accordingly, it is unsurprising that individuals expressing far right views might also endorse this element of pseudoscience/science denial.

Core ontological confusions, previously found as a strong predictor of EUB

endorsement (Lobato et al., 2014) were observed as moderately correlated with paranormal beliefs, while they were weakly correlated with conspiracy theory beliefs and only very weakly correlated with pseudoscience acceptance. Given that these confusions, as described by Lindeman & Aarnio (2006) are the erroneous blending of features of fundamental ontological domains (i.e., physics, psychology, and/or biology), this finding is unsurprising, as it can be argued that many paranormal beliefs arise from such confusions (e.g., belief in ghosts; intentionality and consciousness [psychology] in the absence of corporeal form [biology], translating into an ability to interact with the physical world [physics]).

Beyond univariate analyses, the current study represents an initial step in rectifying some of the potential methodological difficulties observed in examining epistemically unwarranted beliefs and their various correlates. While previous research has attempted to identify individual difference variables as causal factors of EUB endorsement, which has likely led to inconsistency of findings in the extant literature, the current study first applied Latent Profile Analysis to determine if disparate, hidden profiles of belief could be uncovered within the data—a novel approach in the context of EUB analysis.

Findings suggest two discernable, significantly differentiated profiles of belief: one higher on all three domains of EUB examined and one lower (i.e., though to varying degrees between discrete domains). This finding supports the current study's first hypothesis that hidden groups within the data would emerge, differentiated by their profile of EUB endorsement. Accordingly, this result was expected, given that domains of EUBs appear related and thus, higher beliefs in one domain logically infer higher beliefs in the others when considering same group membership. Somewhat paradoxically,

however, it is surprising that *only* two groups emerged, given the diversity of the sample. This result, however, might be due to the relationships between EUB domains themselves. That is, if belief in one domain suggests belief in the others, perhaps lesser/non-belief in one domain is suggestive of lesser/non-belief in the others. Given the novel nature of these findings, and the substantial body of literature addressing differences in EUB endorsement from the perspective of individual level factors (e.g., magical ideation, personality traits, etc.), the current study aimed to obtain a more nuanced view with respect to the associations between identified latent profiles and individual level variables previously studied in the context of EUBs.

When potential correlates of belief were added into the statistical model, Class 2 (i.e., higher on overall EUBs; hence forth referred to as *Believers*), relative to Class 1 (henceforth referred to *Nonbelievers*)⁵, evidenced trends toward New Age spiritual beliefs, alternative spirituality, magical ideation, the personality factor of extraversion, and away from a traditional Christian orientation and the personality domain of antagonism. Observed trends toward New Age beliefs, magical ideation, extraversion, as well as that away from a traditional Christian orientation, with respect to Believers, was unsurprising in the context of literature previously discussed, and given Believers' overall higher level of EUB endorsement, relative to Nonbelievers. Further, Believers' trend toward alternative spirituality was also unsurprising, given that the creators of the SRDS found this construct to be a single factor comprising elements of New Age beliefs *and* unaffiliated spirituality. However, the finding of Believers' trend away from antagonism (i.e., a trait domain consisting of the manipulateness, deceitfulness, and grandiosity trait

⁵ The labels of *Believers* and *Nonbelievers* were implemented as a heuristic to more easily decipher the two identified latent profiles. In reality, Believers were identified as holding more robust EUBs, relative to Nonbelievers, which is not to say that Nonbelievers hold no EUBs.

facets), relative to Nonbelievers, is a novel result. Specifically, one of the only identified studies assessing EUBs in the context of personality traits, as assessed by the PID-5, found the facets of Unusual Beliefs and Experiences and, to a smaller degree, Suspiciousness, as significantly related to conspiratorial thinking (Swami, Weis, Lay, Barron, & Furnham, 2016). Accordingly, any assertions regarding this finding would be without the support of a theoretical framework and, at best, speculative. Given these findings, hypothesis 2, that different correlates of belief would differentially correspond to observed latent profiles, appears to be soundly supported. Overall, and given the research outlined, the associations between individual difference variables and identified latent profiles were somewhat expected, with the exception of antagonism, which is need of further research with respect to EUB endorsement.

In the context of the two identified profiles of belief, the largest discrepancy between specific EUB domains was related to paranormal beliefs (i.e., an 18.12-point mean difference), followed by conspiracy theory beliefs (i.e., a 9.31-point mean difference), and finally pseudoscience endorsement/science denial (i.e., a 3.28-point mean difference). It is possible that the largest discrepancy (i.e., paranormal beliefs) between latent profiles relates to Believers' trend away from traditional Christian religiosity, relative to Nonbelievers, consistent with previous research (e.g., Emmons & Sobal, 1981; Rice, 2003), which suggests that when individuals hold traditionally religious or non-religious paranormal beliefs, they tend to reject the other. Regarding the second largest discrepancy (i.e., conspiratorial beliefs), endorsement of both New Age beliefs, as well as more traditional Christian beliefs may be implicated. Specifically, some research suggests New Age beliefs are positively associated with conspiratorial

thinking, while traditional Christian beliefs are inversely related (Newheiser, Farias, & Taush 2011). This notion fits neatly with the current findings in that Believers evidenced a trend toward New Age Beliefs and a trend away from traditional Christian beliefs.

Further, past research suggests that schizotypy is strongly associated with conspiratorial thinking (Bruder, Haffke, Neave, Nouripanah, & Imhoff, 2013; Neave & Holmes, 2011). Said research also reconciles well with the current findings, as Believers evidenced a trend toward magical thinking, an indicator of schizotypy (Eckbald & Chapman, 1983). With respect to the smallest mean difference between groups (i.e., pseudoscience endorsement), there is no clear, established link with respect to the correlates assessed, which fits any theoretical framework presented by the aforementioned literature. In light of the relatively small mean difference between classes with respect to this one domain of EUB and the notion that said domains appear related, this difference may simply be a byproduct of more robust EUB endorsement overall (i.e., higher belief in one domain related to higher belief in others).

Implications

The first major implication of the present research relates to future analyses in the context of EUBs. Specifically, future researchers may benefit from replicating the current data analytic approach—the implementation of latent profile analysis—to identify profiles of belief not readily apparent via the initial, direct study of individual level difference variables. Secondly, by adding additional, previously studied and unstudied variables into the statistical model, future researchers may provide a broader view of individual factors associated with profiles of belief. Accordingly, the current findings are in need of replication, as they are novel and, at best, suggestive without duplication.

The second major implication of the present research involves the problem of EUB endorsement itself. Specifically, to the untrained eye, unwarranted claims may appear equally as valid as those, which have undergone substantial analysis, review, and confirmation via replication. Further, the ability to discern facts from mere conjecture or outright deceptive claims is now arguably more important than ever, given the rise of the Internet, which has not only enabled the transmission of information nearly instantaneously, but also given anyone with internet access a platform to express their views. Whereas scientists and researchers once spread their findings throughout their community and to the public via conferences, journals, reliable news sources, and so on, anyone and everyone can now convey their opinions regarding a number of areas in which they are not well-versed or trained. Accordingly, such claims, no matter how incorrect or harmful, may appear as valid, trustworthy information.

Hence, one implication of the current study may be the development of protocols by which to combat EUBs, given that underlying profiles of belief appear to represent two broad groups—Believers—with which specific individual difference variables are related both positively and negatively, as well as the current study’s reference group—Nonbelievers. One manner by which this may be accomplished is through the implementation of public service campaigns, which may serve to both inoculate individuals against unwarranted claims by providing valid information prior to encounters with unwarranted claims. Further, providing such data to those who may have already been exposed to misinformation may sway them toward fact-based evidence, as opposed to that, which is unfounded.

Similarly, courses provided within both broader educational programs, as well as

within communities, may be of great benefit in helping to both inoculate individuals against unwarranted claims as they progress through their academic careers, as well as those in the community, which may already hold more fixed beliefs. Specifically, such programs might provide foundational skills in critical thinking, the scientific method, and tools by which to identify misinformation/other epistemically unwarranted beliefs (e.g., how to spot reputable sources of news via their investigative methods and how to question information contained therein). Indeed, there is evidence to suggest such courses may aid in significantly reducing EUB endorsement. For example, Wilson (2018) found that a course in science and critical thinking at the university level significantly reduced students' paranormal and pseudoscience related beliefs.

Overall, the current findings suggest that profiles of belief can be identified. Thus, it is likely possible that interventions to combat the spread of EUBs can be engineered and tailored in the context of future research and findings derived from larger, more diverse samples. Consequently, it may be possible to drastically slow the rampant spread of these beliefs before they cause further, major harm to individuals or society as a whole.

Limitations

Given that the current study found weaker associations between EUBs than have other researchers (e.g., Lobato et al., 2014), it is possible that said relationships fluctuate when different populations are sampled. Thus, a potential limitation of the current research is that the population sampled was perhaps not large or diverse enough to represent the true range of latent profiles related to EUB endorsement within the overall U.S. population.

Additionally, the main method of ascertaining individuals' beliefs regarding EUBs was via the Belief Survey, developed by Lobato et al. (2014). As they noted, this measure is ad hoc in nature and relates to quite specific beliefs in each domain of EUB. Further, they observed that it does not assess for general dispositions of belief, which may be a more accurate manner by which to study EUBs, but rather those, which may be influenced by other variables (e.g., cultural views).

Conclusions

The current study represents an initial step in furthering research methodology as it relates to the investigation of epistemically unwarranted beliefs by introducing a novel data analytic approach, which may lend itself to fewer inconstant results. Further, current findings may suggest that overall, EUB endorsement may best be thought of in terms of group membership, which is associated with specific variables, as opposed to beliefs determined directly by said variables. Lastly, the results presented may aid in the development and implementation of interventions, which may stifle the proliferation of EUBs.

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CURRICULUM VITAE

Kevin A. Waymire, M.Ed., M.A.

EDUCATION

Candidate	Doctor of Philosophy <i>Clinical Psychology</i> Sam Houston State University Huntsville, Texas Dissertation: <i>Making Sense of the Nonsensical: A Nuanced Approach to Unwarranted Beliefs and their Holders</i> Chair: Jorge G. Varela, Ph.D.
2016	Master of Arts <i>Clinical Psychology</i> Sam Houston State University Thesis: <i>Can Race, Social Identity, and Ethnic Identity Explain Perceptions of Law Enforcement Officers after Traffic Stops?</i> Chair: Jorge G. Varela, Ph.D.
2012	Master of Education <i>Counseling</i> University of Houston Houston, Texas
2008	Bachelor of Arts <i>Psychology</i> The University of Texas at Austin Austin, Texas

CLINICAL & PRACTICA EXPERIENCE

August 2018 – July 2019	Pre-Doctoral Practicum Student Clinician <i>Stewart J. Nathan, Ph.D. and Associates</i> Houston, Texas
<i>Population/Setting:</i>	Ethnically diverse adult population referred for neuropsychological assessment in a private practice setting
<i>Duties:</i>	<ul style="list-style-type: none"> ▪ Administer, score, and interpret various neuropsychological assessment measures ▪ Co-author comprehensive, integrated neuropsychological assessment reports ▪ Provide differential diagnoses to referring physicians ▪ Provide assessment feedback and treatment recommendations to patients

Supervisor: Andres Tapia, Ph.D.

October 2015 – Present **Assistant Forensic Evaluator**
Psychological Services Center
 Sam Houston State University
 Huntsville, Texas

Population/Setting: Ethnically diverse adult population involved in the criminal justice system, both incarcerated and residing in the community

- Duties:*
- Conduct court-ordered competence to stand trial and criminal responsibility evaluations generally consisting of comprehensive clinical interviews and symptom response assessments
 - Co-author adult forensic evaluation reports
 - Provide treatment recommendations

Supervisors: Mary Alice Conroy, Ph.D., ABPP & Wendy Elliott, Ph.D.

September 2015 – Present **Pre-Doctoral Practicum Student Clinician**
Psychological Services Center
 Sam Houston State University
 Huntsville, Texas

Population/Setting: Diverse and primarily low-income population of children, adolescents, and adults seeking outpatient services

- Duties:*
- Perform intake interviews and construct treatment plans for clients
 - Conduct individual therapy via empirically-supported treatments; Modalities include: Cognitive Behavioral Therapy, Motivational Interviewing, and Dialectical Behavior Therapy
 - Conduct family therapy via empirically-supported treatments
 - Perform suicide risk assessments and engage in client safety planning
 - Complete comprehensive psychoeducational and psychodiagnostic assessments for self-referred individuals, academic institutions, and other treating professionals

Supervisors: Jorge G. Varela, Ph.D., Darryl Johnson, Ph.D., Craig Henderson, Ph.D., Ph.D., & David Nelson, Ph.D.

June 2018- August 2018 **Pre-doctoral Practicum Student Clinician**
Trauma and Resilience Center
 The University of Texas, McGovern Medical School
 Houston, Texas

Population/Setting: Military Veterans and their families in an outpatient treatment clinic

- Duties:*
- Trained in Cognitive Processing Therapy (CPT)
 - Provided individual adult psychotherapy

Supervisor: Madhavi Reddy, Ph.D.

June 2017 –
May 2018

Pre-doctoral Practicum Student Clinician

University of Texas Health—Harris County Psychiatric Center
Houston, Texas

Population/Setting: Ethnically diverse and primarily low-income adult population with a range of serious mental illness in a secure inpatient psychiatric hospital

- Duties:*
- Provided brief, solution-focused psychotherapy interventions for acute patients; Modalities included: Cognitive Behavioral Therapy (CBT), Cognitive Behavioral Therapy for psychosis (CBTp), Cognitive Processing Therapy (CPT), Dialectical Behavior Therapy (DBT), Motivational Interviewing (MI), and supportive counseling
 - Provided longer-term psychotherapy for patients within the Early Onset Treatment Program (EOTP; generally a 90-day program with 1-2 sessions per week)
 - Engaged in crisis intervention and conducted suicide and homicide safety plans
 - Conducted psychodiagnostic and cognitive/neuropsychological assessments
 - Co-facilitated Dialectical Behavior Therapy (DBT) skills groups
 - Attended weekly clinical rounds and treatment team meetings addressing treatment needs, concerns, and modifications for patients
 - Participated and presented in weekly case conferences
 - Case conference presentation: *Substance Withdrawal Delirium* (8/1/2017)

Supervisors: Alia Warner, Ph.D. (primary), Elaheh Ashtari, Psy.D., & Andres Tapia, Ph.D.

December 2017

Assistant Forensic Evaluator

Psychological Services Center
Huntsville, Texas

Population/Setting: Incarcerated adult males with repeat sexual offenses in a state prison

- Duties:*
- Conducted a behavioral abnormality and risk assessment of a

prisoner being considered for civil commitment as a Sexually Violent Predator

- Discussed case and case formulation with primary supervisor
- Assisted in writing a report to be presented in court proceedings

Supervisor: Jorge G. Varela, Ph.D.

May 2016 –
May 2017

Clinic Coordinator
Psychological Services Center
Sam Houston State University
Huntsville, Texas

Population/Setting: Diverse, low-income, and multi-ethnic population of children, adolescents, and adults seeking outpatient services

- Duties:*
- Conducted semi-structured telephone intake interviews for potential clients
 - Worked with clinic director to determine client appropriateness for clinical services and level of experience required by student clinician to address presenting problem
 - Led weekly clinic meetings of clinicians and supervisors to assign cases and facilitate group discussion of clinical/ethical issues
 - Trained junior clinical doctoral students in clinic operating procedures and record-keeping
 - Assisted in day-to-day administration at the Sam Houston State University Psychological Services Center
 - Conducted Quality Assurance reviews of all cases quarterly and provided associated feedback to student clinicians
 - Conducted comprehensive adult psychodiagnostic and psychoeducational evaluations
 - Provided individual, evidence-based psychotherapy services

Supervisor: Mary Alice Conroy, Ph.D., ABPP

June 2012 –
December 2012

Pre-Master's Practicum Student Clinician
A Nurturing Home
Houston, Texas

Population/Setting: Children and adolescents, including those with special needs, in a private practice setting

- Duties:*
- Provided individual psychotherapy
 - Conducted psychodiagnostic assessments using both objective

- and projective assessment measures
- Co-authored comprehensive integrated assessment reports
- Led group therapy sessions and facilitated psychoeducational groups

Supervisor: Lyle Cadenhead, Ph.D.

SUPERVISORY EXPERIENCE

August 2018 –
Present

Peer Supervisor
Doctoral Practicum I
Sam Houston State University
Huntsville, Texas

- Duties:*
- Co-supervise a junior doctoral student providing psychotherapy and conducting psychological assessments in a psychology training clinic
 - Review session videos with supervisee and provide feedback related to interviewing and therapy techniques
 - Review and provide feedback on progress notes, treatment plans, and clinical reports
 - Review assessment protocols and provide feedback on administration and scoring of psychodiagnostic instruments

Supervisor: Darryl Johnson, Ph.D.

January 2018 –
May 2018

Peer Supervisor
Theory and Research in Psychotherapy
Sam Houston State University
Huntsville, Texas

- Duties:*
- Supervised first-year clinical psychology doctoral students' simulated therapy sessions
 - Provided feedback consistent with designated therapeutic modalities
 - Conducted mock sessions within supervision to demonstrate implementation of empirically-supported interventions

Supervisor: Craig Henderson, Ph.D.

August 2016 –
May 2017

Peer Supervisor
Doctoral Practicum I
Sam Houston State University
Huntsville, Texas

- Duties:*
- Co-supervised a junior doctoral student providing

psychotherapy and conducting psychological assessments in a psychology training clinic

- Reviewed session videos with supervisee and provided feedback related to interviewing and therapy techniques
- Reviewed and provided feedback on progress notes, treatment plans, and clinical reports
- Provided feedback related to interviewing, testing techniques, and report writing
- Reviewed completed testing protocols and provided feedback on scoring of psychodiagnostic instruments

Supervisor: Craig Henderson, Ph.D.

May 2016-
June 2016

Peer Supervisor

Introduction to Practicum

Sam Houston State University
Huntsville, Texas

- Duties:*
- Co-supervised a junior doctoral student in their first exposure to psychotherapy
 - Reviewed session videos with supervisee and provided feedback related to relevant interviewing and therapy techniques
 - Discussed the basic elements of therapy and different modalities of treatment delivery

Supervisor: Mary Alice Conroy, Ph.D., ABPP

TEACHING EXPERIENCE

October 2017

Guest Lecturer***Psychopathology (PSYC 5330)***Department of Psychology and Philosophy
Sam Houston State University

- Duties:*
- Presented comprehensive case conceptualization of a psychotherapy client presenting with severe social anxiety disorder (SAD)
 - Discussed disorder symptoms, classification, as well as conceptualized etiological and maintaining factors
 - Facilitated discussion regarding the intersection of empirically supported treatments for SAD and client factors
 - Presented treatment course and outcome

Supervisor: David Nelson, Ph.D., ABPP

April 2017

Guest Lecturer***Law and Social Psychology (PSYC 7333)***Department of Psychology and Philosophy
Sam Houston State University

- Duties:*
- Discussed various aspects of law enforcement within the state of Texas, including social psychological elements of officer/citizen interaction
 - Facilitated conversation with respect to the recruiting process of law enforcement agencies in Texas and how social psychology is applied to interviewing techniques

Supervisor: Rowland Miller, Ph.D.

August 2016 –
December 2016**Teaching Assistant*****Psychology and the Law (PSYC 3383)***Department of Psychology and Philosophy
Sam Houston State University

- Duties:*
- Created and delivered comprehensive lectures regarding the various intersections of psychology and the criminal justice system
 - Engaged directly with students and answered unique questions as they arose during discourse
 - Developed and administered all course exams and assignments
 - Engaged in active office hours, providing students the opportunity to ask questions and clarify course content in both individual and group formats

Supervisor: Christopher Wilson, Ph.D.

August 2014 –
May 2015

Teaching Assistant
Introduction to Psychology (PSYC 1301)
Department of Psychology and Philosophy
Sam Houston State University

- Duties:*
- Created and delivered comprehensive lectures regarding a broad range of general psychological topics
 - Facilitated an active learning environment in which students were encouraged to engage directly in class discussion with both myself and their peers
 - Developed and administered all course exams and assignments
 - Provided multiple opportunities per week for students to take advantage of office hours in both individual and group formats
 - Engaged in pre-test study sessions for students in need of further instruction

Supervisor: Christopher Wilson, Ph.D.

PUBLICATIONS

Waymire, K.A., Muñoz, C.G., & Venta, A.C. (2018). *Measuring perceptions of the United States Justice System among Spanish-speaking youth: Translation and psychometric assessment*. Manuscript submitted for publication.

Waymire, K. A., Varela, J. G., & Schiafo, M. C. (2018). *Perceptions of the police: An exploration of race and ethnic identity*. Manuscript submitted for publication.

Waymire, K. A., Varela, J. G., & Schiafo, M. C. (2018). *A novel approach to measuring perceptions of the police: Procedural justice in analogue scenarios*. Manuscript in preparation.

Waymire, K. A., Varela, J. G., & Schiafo, M. C. (2018). *Social identity and views on police legitimacy*. Manuscript in preparation.

Murphy, K., Cramer, R. J., **Waymire, K. A.,** & Barkworth, J. (2017). Police bias, social identity, and minority groups: A social psychological understanding of cooperation with police. *Justice Quarterly*, 35(6), 1105-1130.
doi:10.1080/07418825.2017.1357742

CONFERENCE PRESENTATIONS

- Camins, J., Holdren, S., Varela, J., **Waymire, K.A.**, & Schiafo, M.C. (2019, March). *Criminal culpability: Does military status matter?* Poster session submitted for consideration to the annual meeting of the American Psychology-Law Society, Portland, OR.
- Schiafo, M., **Waymire, K.**, & Anderson, J.L. (2019, March). *The utility of the Belief in Female Sexual Deceptiveness Scale in understanding sexual aggression.* Poster session submitted for consideration to the annual meeting of the American Psychology-Law Society, Portland, OR.
- Waymire, K. A.**, Muñoz, C. G., & Venta, A. C. (2019, March). *Measuring perceptions of the United States Justice System among Spanish-speaking youth: Translation and psychometric assessment.* Poster session submitted for consideration to the annual meeting of the American Psychology-Law Society, Portland, OR.
- Ball-Cooper, E., Abate, A., **Waymire, K.A.**, & Malchow, A. (2018, March). *The longitudinal impact of parental hostility and exposure to violence on borderline personality features among justice-involved youth.* Poster session presented at the annual meeting of the American Psychology-Law Society, Memphis, TN.
- Damnjanovic, T., Miller, R.S., Ryan, L., Lawrence, J.M., & **Waymire, K.A.** (2018, March). *Can death qualification reduce bias in sentencing decisions? Exploring factors impacting capital sentencing.* Poster session presented at the annual meeting of the American Psychology-Law Society, Memphis, TN.
- Schiafo, M., Henderson, C., Falgout, R., Goodson, A., Smith, T., Barrow, C., **Waymire, K.A.**, & Missimo, C. (August, 2017). *#HealthyLiving: Social media comparisons among college students.* Poster session presented at the annual meeting of the American Psychological Association, Washington, DC.
- Waymire, K. A.**, Varela, J. G., & Schiafo, M. C. (2017, August). *Procedural justice, police legitimacy, and the influence of race and identity.* Poster session presented at the annual meeting of the American Psychological Association, Washington, DC.
- Damnjanovic, T., Miller, R., Lawrence, J., & **Waymire, K.A.** (2017, March). *Sentencing goals, the death penalty, and jury decision-making.* Poster session presented at the annual meeting of the American Psychology-Law Society, Seattle, WA.
- Schiafo, M., Ball, E., **Waymire, K.A.**, Ryan, L. & Henderson, C. (2017, March). *Explaining the relation between aggression and delinquency: Individual and peer factors.* Poster session presented at the annual meeting of the American Psychology-Law Society, Seattle, WA.

Waymire, K. A., Varela, J.G., Schiafo, M., Holdren S., Miller, R., Lawrence, J., Ibarra, D. & Camins, J. (2017, March). *Do race and ethnic identity influence perceptions of law enforcement officers after traffic stops?* Poster session presented at the annual meeting of the American Psychology-Law Society, Seattle, WA.

Cramer, R. J., Murphy, K., **Waymire, K. A.**, & Barkworth, J. (March, 2016). *Police bias, social identity, and ethnicity: A social psychological understanding of cooperation with police.* Symposium conducted at the annual meeting of the American Psychology-Law Society, Atlanta, GA.

Damnjanovic, T., Miller, R., Lawrence, J., **Waymire, K.A.**, & Bailey, C. (2015, August). *Does an eye for an eye leave the jury blind? Vengefulness and jurors' decision-making.* Poster presented at the American Psychological Association annual conference, Denver, CO.

RESEARCH EXPERIENCE

July 2018 –
July 2019 **Principal Investigator**
Graduate Research Laboratory
Sam Houston State University

Project/Duties: Making sense of the nonsensical: A nuanced approach to unwarranted beliefs and their holders (Dissertation Project, Lead Investigator)

- Develop a project exploring latent profiles of individuals readily accepting of conspiracy theories, the paranormal, and pseudoscience/science denial and the individual difference variables associated with those profiles
- Obtain a sample of participants representative of the U.S. population
- Coordinate and conducted data collection
- Enter and analyze data using SPSS
- Present findings to dissertation chair and committee for approval

Chair: Jorge G. Varela, Ph.D.

August 2018-
July 2019 **Graduate Research Assistant**
Assessment of Personality Psychopathology Laboratory
Sam Houston State University

Project/Duties: Decision Making in College Students (Research Assistant)

- Administer and score various neuropsychological instruments
- Supervise undergraduate research assistants in their respective duties

- Co-authored grant funding the current project

Supervisor: Jaime L. Anderson, Ph.D.

November 2016 – **Graduate Research Assistant**
January 2019 ***Youth and Family Studies Laboratory***
Sam Houston State University

Project/Duties: *Psychosocial Assessment of Justice Involved Youth (Research Assistant)*

- Administer a wide range of psychological assessments to detained juveniles

Supervisor: Amanda Venta, Ph.D.

February 2016- **Principal Investigator**
August 2016 ***Graduate Research Laboratory***
Sam Houston State University

Project/Duties: *Do race, social identity, and ethnic identity influence perceptions of law enforcement officers after traffic stops? (Thesis Project, Lead Investigator)*

- Developed a project exploring the role of race, social identity, and ethnic identity on perceptions of law enforcement officers within analogue scenarios
- Created study stimuli via coordination with a local police department
- Obtained a sample of participants representative of the U.S. population
- Coordinated and conducted data collection
- Entered and analyzed data in SPSS
- Presented findings to thesis chair and committee for approval

Chair: Jorge G. Varela, Ph.D.

August 2007- **Undergraduate Research Assistant**
May 2008 ***Stress, Coping, and Health Laboratory***
The University of Texas at Austin

- Duties:*
- Administered, collected, and scored research measures
 - Coded and entered relevant data
 - Provided supplemental support to laboratory research projects

PROFESSIONAL DEVELOPMENT

SEMINARS & TRAININGS

October 2018	CPT Web On-line Training Course for CPT Medical University of South Carolina
September 2018	Cross-Cultural Variation of Adult Attachment Functioning Chiachih DC Wang, Ph.D.
May 2018	Critical Thinking in Forensic Psychological Evaluations Terry Kukor, Ph.D., ABPP
May 2018	Controversies in Forensic Mental Health Assessment Terry Kukor, Ph.D., ABPP
May 2017	Cardiopulmonary Resuscitation (CPR) University of Texas Health—Harris County Psychiatric Center
May 2017	Satori Alternatives to Managing Aggression (SAMA) Non-Violent Crisis Intervention Training
April 2017	Indispensable Forensic Psychology in the Era of Neuroscience and Genetics Stephen J. Morse, J.D., Ph.D.
January 2017	LGBTQ Issues in Psychology and Clinical Work Drew Miller, Ph.D.
November 2016	Getting it Wrong About Miranda Rights: Research on our Myths and Misconceptions Richard Rodgers, Ph.D.
July 2016	Criminal Responsibility and Forensic Report Writing Mini-Workshop Brittany P. Bate, M.A. & Kelsey L. Laxton, M.A.
April 2016	Advancing Recidivism Reduction Efforts: RNR Simulation Tool Faye S. Taxman, Ph.D.
February 2016	Child Custody Evaluations John Zervopoulos, J.D., Ph.D.
February 2016	Evaluation of Risk for Violence using the HCR-20, Version 3 Stephen Hart, Ph.D. & Kevin Douglas, Ph.D., L.L.B.
April 2015	Callous-Unemotional Traits and Conduct Disorder: Implications for Understanding, Diagnosing, and Treating Antisocial Youth Paul J. Frick, Ph.D.
November 2014	Innocence Project of Texas Nick Vilbas, J.D.

SPECIALIZED CLINICAL COURSEWORK

Spring 2017	Mental Health Law Instructor: Phillip Lyons, J.D., Ph.D.
Summer 2016	Human Neuropsychology/Neuropsychological Assessment Instructor: David Nelson, Ph.D., ABPP.
Spring 2016	Forensic Assessment II (emphasis on civil forensic evaluations, including juvenile forensic issues) Instructor: Mary Alice Conroy, Ph.D., ABPP.
Fall 2015	Supervision Seminar Series Instructors: Mary Alice Conroy, Ph.D., ABPP & Jorge Varela, Ph.D.
Fall 2015	Forensic Assessment I (emphasis on criminal forensic evaluations) Instructor: Mary Alice Conroy, Ph.D., ABPP.

PROFESSIONAL SERVICE AND LEADERSHIP

January 2017- December 2017	<i>Diversity Committee Student Member</i> Sam Houston State University Huntsville, Texas
	<i>Duties:</i> <ul style="list-style-type: none"> ▪ Assisted in addressing issues related to recruiting and retaining students and faculty from culturally diverse backgrounds ▪ Provided recommendations regarding diversity related issues within the clinical psychology doctoral program at Sam Houston State University ▪ Worked to promote and improve multicultural training within the clinical psychology doctoral program ▪ Co-led a project generating videos for the Sam Houston State University clinical psychology program website, emphasizing the importance of program diversity and recruitment
September 2015	<i>Student Clinician Volunteer/Community Outreach</i> Psychological Services Center, Sam Houston State University Huntsville, Texas
	<i>Duties:</i> <ul style="list-style-type: none"> ▪ Met with local mental health professionals and provided information regarding the potential role of the Sam Houston State University Psychological Services Center in the provision of community services ▪ Supplied follow-up support to community providers with respect to potential client referrals

PROFESSIONAL MEMBERSHIPS

2016 – Present American Psychological Association

2016 – Present American Psychology-Law Society (APA Division 41)