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Investigating the Effects of Absurd Humor And Mortality Salience On Moral Identity, Belongingness, Belief in a Just World, and Meaning In Life

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INVESTIGATING THE EFFECTS OF ABSURD HUMOR AND MORTALITY SALIENCE

ON MORAL IDENTITY, BELONGINGNESS, BELIEF IN A JUST WORLD, AND

MEANING IN LIFE

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Abstract

Background: Humans have a sense of meaning, and people actively create and maintain meaning in their lives. One way humans make meaning is through fluid compensation, which is the automatic process of compensating for a threat to one's global meaning system by temporarily strengthening other, non-related beliefs. This phenomenon has been thoroughly investigated in response to mortality salience (i.e., reminders of one's death), but not absurd humor. This is important because little is known about the role of humor in meaning making. More research is needed to determine whether humor is a unique meaning-making process. Further, no studies have investigated the effects of absurd humor and mortality salience on multiple aspects of the global meaning system. Finally, influential models of meaning making suggest that distress tolerance moderates meaning-making processes — but this has not been empirically verified. The present study aimed to fill these gaps in the literature by investigating the fluid compensatory effects of absurd humor and mortality salience on moral identity, belongingness, belief in a just world, and meaning in life.

Results: Participants found humor in each reading condition and did not fluid compensate, suggesting that humor is a meaning-making process. Since fluid compensation was not detected, the role of distress tolerance in meaning making remains a fruitful direction for research.

Discussion: The results of the current study indicate that humor is a meaning-making process and bidirectional fluid compensation is theoretically possible. Research corroborating humor as a meaning-making process, the mechanism(s) by which humor works within the context of

meaning making, and the clinical application of humor have important implications for people's mental and physical health.

For Jojo and Papa, my heart.

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I.   INTRODUCTION

Meaning and Meaninglessness

The constructs of *meaning* and *meaning in life* are ubiquitous in psychology. Across the

discipline, meaning shares the theme as something to live *for* and *by*; ideas to act towards and

organize one's life around (Yalom, 1980). Viktor Frankl defined meaning as something to live

for, or the striving and struggling for a worthwhile goal (Frankl, 1959/2006). Similarly,

behaviorists equate meaning with values, which are verbal constructions that recursively

organize and reinforce behavior towards themselves (Finkelstein-Fox, Pavlacic, Buchanan,

Schulenberg, & Park, 2020). From these perspectives, meaning is a personally-valued verbal

construction and meaning in life is defined as the extent to which people are acting within a

pattern of valued activity (i.e., values-based action). Aside from organizing behavior, meaning is

also understood as that which makes reality coherent and predictable for a person — a mental

representation of expected associations (Heine, Proulx, & Vohs, 2006; Maher, Van Tilburg, &

Van Den Tol, 2013). For decades, theorists have combined these definitions in various ways to

account for a unified construct of meaning in life; for instance, Irvin Yalom (1980) defined

meaning as coherence, and meaning in life as the extent to which people apply themselves to

overarching goals. Most recently, meaning in life is operationalized as a multidimensional

construct consisting of three facets: (1) comprehension, or the degree to which one thinks their

life makes sense, (2) purpose, or the extent to which one is participating in values-based action, and (3), mattering, or perceiving that one's life is important (Heintzelman & King, 2014; Hooker, Masters, & Park, 2018; Martela & Steger, 2016). Meaninglessness, on the other hand, is generally understood as the partial or complete absence of perceived meaning in life (e.g., reporting a misalignment of action with personal values, a lack of comprehension, or a perceived absence of mattering) (Harlow, Newcomb, & Bentler, 1986; Schulenberg, Hutzell, Nassif, & Rogina, 2008; Stillman, Baumeister, Lambert, Crescioni, Dewall, & Fincham, 2009; Van Tongeren & Green, 2010).

The level to which people report having a sense of meaning in life is associated with a diverse array of implications for physical and mental health (Czekierda, Banik, Park, & Luszczynska, 2017; Heintzelman & King, 2014; Hooker et al., 2018; Melton & Schulenberg, 2008).[1] Meaning in life is a mediator of physical and psychological health (Haugan, 2014). Across cultures, having a sense of meaning in life is associated with positive health outcomes and a heightened sense of well-being (Czekierda et al., 2017; Schulenberg et al., 2008). People who perceive their values as aligning with their actions endorse less anxiety and depression, greater personal growth following negative life events, and healthier coping after the death of a loved one (Finkelstein-Fox et al., 2020). Values-based action is also associated with greater pain tolerance, quickened recovery from traumatic brain injury, and less physical distress (Finkelstein-Fox et al., 2020). Other positive health outcomes of perceived meaning include fewer chronic health conditions (e.g., cardiovascular disease), longer lifespans, and a lower prevalence of dementia among older adults (Heintzelman & King, 2014; Musich, Wang,

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[1] Hereafter "meaning in life" will be used interchangeably with "meaning". For the purpose of this study, both refer to global perceptions of perceived mattering, coherence, and purpose — outcomes of successful meaning making (see below).

Kraemer, Hawkins, & Wicker, 2018). Having a sense of meaning is also associated with work enjoyment, life satisfaction, and happiness (Steger, Frazier, Oishi, & Kaler, 2006). In military populations, meaning in life buffers against the psychological distress resulting from posttraumatic stress (Owens, Steger, Whitesell, & Herrera, 2009). Finally, early evidence suggests that meaning salience (or the extent to which people are aware of what makes their life meaningful) lessens the impact of stress, improves coping responses, and increases health-related behaviors (Hooker et al., 2018).

Meaninglessness is associated with negative physical and mental health outcomes (Schulenberg et al., 2008; Steger et al., 2006). Lacking a sense of purpose in life is a mediational factor for depression, self-derogation, substance use, and suicidal ideation (Harlow et al., 1986). Among assisted living populations, lack of meaning in life is related to negative emotionality (e.g., sadness), worry, and loss of hope (Haugan, 2014). Furthermore, absence of meaning is associated with boredom (Melton & Schulenberg, 2007) and distress (Steger et al., 2006). Among Polish college students, Mausch (2009) found a significant correlation between perceived meaninglessness and psychosomatic disorders, such that those perceiving meaninglessness tended to experience physical weakness, physical pain, and digestive system disorders. Other negative outcomes of meaninglessness include a higher predominance of posttraumatic stress, anxiety, experiential avoidance, boredom, and social norm violations (Schulenberg, Baczwaski, & Buchanan, 2014; Schulenberg et al., 2008; Steger et al., 2006).

In sum, people have a sense of meaning in life — global perceptions of comprehension, mattering, and purpose. As discussed above, each of these components are associated with health and well-being, whereas absence of one or more of these components can potentially be harmful. Frankl (1959/2006) asserted that contending with intermittent states of meaninglessness is an

essential feature of being human. Crucially, Frankl also maintained that perceived meaninglessness is not a perpetual state of doom — it can motivate people to discover meaning under any circumstance (Frankl, 1959/2006; Schulenberg et al., 2008). People build perceptions of meaning, as well as work to keep those perceptions intact.

Meaning Making

Thus, beyond possessing a sense of meaning, humans are actively motivated to *create* (or to search for and discover) and *maintain* meaning in their lives (Frankl, 1959/2006; Heine et al., 2006; Park, 2010; Proulx & Heine, 2006; Schulenberg et al., 2008; Steger et al., 2006; Steger, Owens, & Park, 2015). This idea is in part supported by the health implications of perceived meaning in life discussed above. Additional empirical evidence is derived from the literature examining the construct of meaning making (or, synonymously, meaning maintenance; see Heine et al., 2006; Park, 2010; Park & Blake, 2020; Proulx & Heine, 2006 for reviews). Meaning making refers to the complex process of building, protecting, and updating the global meaning system as one interacts with their environment (Heine et al., 2006; Park, 2010; Park & Blake, 2020). The global meaning system refers to an individual's inner representation of the world, including beliefs (e.g., "beliefs about the world, beliefs about the self, beliefs about the self and the world"; Park & Folkman, 1997, p. 116), goals (i.e., personally-valued verbal constructions), and feelings (e.g., having a subjective sense of significance in life) (Park, 2010). An intact global meaning system is that which gives rise to perceptions of meaning in life (i.e., perceptions of mattering, purpose, and coherence) — indeed, it is the lens through which people perceive the world (Park, 2010; Proulx & Heine, 2006). The global meaning system is a network of "mental representations of anything that one might expect to be related to anything else — people, places,

objects, events — in any way that they could be construed as related — causally, spatial-temporally, teleologically" (Proulx & Heine, 2006, p. 310).

Park's meaning-making model (2010) describes meaning making as a recursive process in which violations of expectations (i.e., meaning threats) cause distress, provoking meaning-making processes and the subsequent refinement of the global meaning system.[2] In this model, one's global meaning system is used to appraise events. If a discrepancy between global meaning and an event (i.e., a meaning threat) is detected, distress is produced, triggering meaning-making processes (Heine et al., 2006; Park, 2010, 2016; Park & Blake, 2020). Such processes include (1) assimilation (or revision) — adjusting the global meaning system to account for the discrepancy; (2) integration (or reinterpretation) — adjusting the discrepancy to account for the global meaning system; or (3) fluid compensation (or reaffirmation) — affirming one or more aspects of the global meaning system to compensate for the discrepancy (Currier, Holland, Chisty, & Allen, 2011; Heine et al., 2006; Park, 2010; Proulx & Heine, 2006). The last step of the meaning-making model is interrelated with the former, and involves the consequences of meaning-making processes. These consequences include subjective feelings of things having made sense (e.g., sense-made, posttraumatic growth), acceptance (i.e., coming to terms with the discrepant event), understanding the cause of the event, perceptions of positive life changes, identity reconstruction, transformation of the meaning of the event, changing global beliefs (e.g., beliefs about coherence, mattering, and purpose), and changing global goals (Park, 2010; Steger et al., 2015). Meaning is therefore made by reducing the discrepancy between events in the world and one's inner representation of the world, which, along with the outcomes mentioned above, gives rise to a sense of meaning in life (Park, 2010; Park & Gutierrez, 2013; Steger et al., 2015).

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[2] Consistent with prior literature (e.g., Heine et al., 2006), "meaning threat" will be used to refer to stimuli that violate expectations, thereby producing a discrepancy between the environment and global meaning system.

Park's meaning-making model posits that successful meaning making (i.e., aligning global meaning with events in the world) results in growth and well-being. Conversely, failure to make meaning results in psychopathology and distress (Park, 2010, 2016). These assertions are well established in the literature. Meaning making is a predictor of well-being (Park & Gutierrez, 2013). People who make meaning of traumatic experiences generally report lower levels of distress (Steger et al., 2015). American combat veterans, for example, experience less PTSD symptomatology and psychiatric distress after aligning potentially traumatic events with their belief system (Currier et al., 2011; Steger et al., 2015). Similarly, meaning making (e.g., believing one has grown as a result of one's experiences) moderates the relationship between attachment anxiety and posttraumatic stress symptom severity in undergraduate students (Owens, 2016). These effects are not limited to combat veterans and undergraduates, however. Scores on the Meaning-Making Questionnaire mediate the relationship between self-efficacy and psychological well-being in patients with heart disease (Krok & Zarzycka, 2020). In cancer survivors, making meaning of one's life relates positively to posttraumatic growth and adaptive adjustment (Owens, 2016; Park, Edmondson, Fenster, & Blank, 2008). On a larger scale, meaning making predicts adaptive coping, posttraumatic growth, and less distress after terrorist attacks and natural disasters (Haynes, Van Tongeren, Aten, Davis, Davis, Hook, Boan, & Johnson, 2017; Park, 2016; Park, Riley, & Snyder, 2012; Weber, Pavlacic, Gawlik, Schulenberg, & Buchanan, 2019). In addition, meaning making serves as a protective factor against grief. In Chinese elders having lost their spouses, meaning making mediated the relationship between intimacy and complicated grief such that successful meaning making corresponded to less grief (Pan, Cheung, & Hu, 2018). Finally, meaning making has been shown to have a critical role in

acculturation (Pan, Ye, Chen, & Park, 2019), positive adjustment after a loss (Park, 2008), and coping effectively with stress (Krok, 2015).

Research on the meaning-making model has primarily focused on the effects of aligning global meaning with distressing experiences (Park & Ai, 2006). Far less research has investigated meaning-making processes in and of themselves. One recent exception is fluid compensation, which is an automatic meaning-making process (Heine et al., 2006). Fluid compensation is the act of responding to a misalignment between global meaning and an event (i.e., a meaning threat) by automatically strengthening other aspects of the global meaning system (Heine et al., 2006). In other words, meaning threats can provoke the affirmation of unrelated beliefs as a compensatory response to the negative arousal produced by violations of expectations. The following quote illustrates examples of such a response:

> [E]ncountering information that signifies one's own mortality provides a threat to the relations between the self and the external world. In response to such a threat, people may see patterns within noise (and thereby identify new relations among events in the external world), enhance the value of their ingroup (thereby creating relations between one-self and a desirable group… creating desirable associations between oneself and the external world). (Heine et al., 2006, p. 93; citations excluded).

Fluid compensation makes meaning insofar as it assuages the distress of detecting an incongruity between the environment and global meaning, thereby acting as a reduction discrepancy mechanism (Proulx & Heine, 2006; Proulx & Inzlicht, 2012; Randles, Inzlicht, Proulx, Tullet, & Heine, 2015; Taylor & Noseworthy, 2020; Tullett & Heine, 2015).

Fluid compensation is the subject of burgeoning empirical support. For example, invoking a meaning threat (i.e., having to write about how a boring advertisement was

interesting) has caused participants to punish a moral norm violator more severely (i.e., increase the amount of bail for a person who had been arrested for prostitution)[3], endorse a stronger belief in God, and perceive abstract patterns in an implicit grammar task (Randles et al., 2015). Exposure to manipulations causing people to question their self-views made participants more likely to affirm alternative sources of meaning, such as punishing sex workers with greater bail amounts and rewarding "social heroes" with greater amounts of money (Boucher, Bloch, & Pelletier, 2016). Other authors have suggested that increasing self-uncertainty salience increases drive for self-esteem (Yang, Ybarra, Van ben Bos, Zhoa, Guan, Cao, Li, & Huang, 2019). Writing about death or watching a surrealist film has caused people to become more likely to punish lawbreakers by increasing bail amounts for sex workers in the Social Judgment Survey (Randles, Heine, & Santos, 2013), and reading a surreal short story caused participants to identify more closely to their culture (Randles, Proulx, & Heine, 2011). Fluid compensation can also be evoked by nonconscious meaning threats. For example, when participants were exposed to syntactically unrelated word-pairings (e.g., "turn-frogs"), they tended to increase their endorsement of punishment in the Social Judgment Survey (Randles et al., 2011). In addition, unexpectedly changing the identity of a confederate during an activity also caused participants to affirm certain moral beliefs via the Social Judgment Survey (Proulx & Heine, 2008). Van Tongeren and Green (2010) evoked fluid compensation by implicitly priming participants with words related to meaninglessness (e.g., "empty"). In response, participants reported higher levels of self-esteem, symbolic immortality, and preference for closure (Van Tongeren & Green, 2010). Maher, Van Tilburg, and Van Den Tol (2013) elicited fluid compensation by exposing people to a

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[3] Setting bail amounts, rating the severity of the offense, and rating how severely a defendant accused of prostitution should be punished is a common manipulation for assessing compensatory affirmation of moral beliefs (specifically, the belief that prostitution is wrong) in the meaning making literature. This manipulation is called the Social Judgment Survey (e.g., Randles et al., 2011).

meaning threat in the form of a piece of music (i.e., a song with a strange time signature). After these participants heard the song, they tended to punish sex workers more harshly in the Social Judgement Survey. Similarly, when Proulx and Major (2013) created meaning threats by exposing people to unconventionally colored playing cards, participants displayed an increased preference for social equality. Fluid compensation also influences consumer behavior; meaning threats like oddly colored tissue boxes, ribbon-shaped shoes, and bagged soft drinks result in the bolstering of preference for dominant brands (Taylor & Noseworthy, 2020). Furthermore, fluid compensation was shown to reduce negative arousal produced by the meaning threat (Taylor & Noseworthy, 2020).

The research discussed above demonstrates that fluid compensation is an automatic meaning-making process — meaning threats cause people to bolster unrelated aspects of their global meaning system. Since the global meaning system is comprised of all of one's beliefs (Park, 2010; see above), it can be divided into three main facets: concepts related to the self, concepts related to the world, and concepts related to the self in relation to the world (Heine et al., 2006). Three constructs that are representative of these facets include moral identity (a concept regarding the self), belongingness (a concept regarding the self in relation to the world), and belief in a just world (a concept regarding the world). In the following sections, each construct is reviewed, as well as the implications of meaning making in relation to each construct on physical and mental health.

Moral Identity

Moral identity involves how important one's sense of morality and being a moral person are to one's conception of self (Hardy, 2018). Such a conception requires relations nested within the global meaning system from which to perceive and act morally in the world. Moral traits are

self-regulating verbal constructions that reinforce behavior toward themselves (Jennings, Mitchell, & Hannah, 2015). As such, moral traits may be considered a specific kind of value within the global meaning system. Aquino and Reed (2002) empirically identified nine moral traits: caring, compassionate, fair, friendly, generous, helpful, hardworking, honest, and kind. Moral identity is operationalized as the degree to which an individual relates to moral traits (internalization), as well as the extent to which individuals engage in action that is consistent with those traits (symbolization) (Aquino & Reed, 2002). In this context, moral identity is a subset of one's sense of purpose: the extent to which one is behaving towards moral-specific traits or values.

Aquino and Reed's (2002) theory of moral identity posits that people are prompted to act in ways that are in-line with their identity. Likewise, acting morally contributes to people's sense of moral identity. Both internalization and symbolization have been found to predict prosocial behavior (Aquino & Reed, 2002; Reynolds & Ceranic, 2007). Additionally, moral identity relates to treating employees fairly (Brebels, De Cramer, Van Dijke, & Van Hiel, 2011), being less influenced by arbitrary organizational rules (Moberg & Caldwell, 2007), and donating money to charity (Conway & Peetz, 2012). Research also suggests that people with a strong sense of moral identity have a larger circle of moral regard (Reed & Aquino, 2003). Furthermore, moral values and moral behavior have been identified as some of the strongest contributors to selfhood in general (Strohminger & Nichols, 2014).

Consistent with the meaning-making model, research suggests that events that are incongruous with people's moral identity (i.e., moral meaning threats) elicit negative arousal and subsequent attempts to ameliorate the discrepancy (Aquino, Freeman, Reed, Lim, & Felps, 2009; Hardy, 2018). Jordan, Elizabeth, and Murninghan (2011) found that people who recall past

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immoral behavior are more likely to act morally in order to establish a consistent moral identity. Further, the perceived magnitude of the moral transgression predicted compensatory moral action such as endorsing higher self-conceptions of moral identity and cheating less on a math task (Jordan et al., 2011). This effect is consistent with other research examining responses to moral meaning threats. For instance, when participants were prompted to think about morally-questionable acts (e.g., selling human body parts), they tended to immediately engage in prosocial behavior such as endorsing a willingness to donate to charity (Tetlock, Kristel, Elson, Green, & Lerner, 2000). Implicit moral primes have also been shown to increase the accessibility of moral identity relations within the global meaning system and subsequently influence behavior (Aquino et al., 2009). For example, when people's moral identity is primed, one study demonstrated that participants tended to experience an increase of negative emotionality toward the ill-treatment of prisoners in Guantanamo Bay (Aquino, Reed, Thau, & Freeman, 2007), and in another study the demonstrated response to moral identity being primed was increased intention to donate to a charity (Aquino et al., 2009). Similarly, moral meaning threats may be resolved through reinterpreting situations to become more consistent with one's moral identity (see, e.g., Aquino et al., 2007 for a discussion of moral disengagement and Camilleri, Gill, & Jago, 2020 for an interesting example of moral disengagement as relates to eating animal meat).

When these moral meaning-making processes do not work — that is, when moral meaning threats remain unresolved — moral injury may occur. Moral injury is a term for the deleterious effects of witnessing, failing to prevent, or participating in acts that violate one's moral identity (Litz, Stein, Delaney, Lebowitz, Nash, Silva, & Maguen, 2009). The symptoms of moral injury include guilt, shame, loss of trust, depression, anxiety, anger, reexperiencing the event, self-harm, and social problems (Jinkerson, 2016). In veterans, moral injury increases the

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likelihood of poor mental health outcomes (Jamison, Usher, Maple, & Ratnarajah, 2020). Indeed, moral injury may be so significant as to risk affecting the global meaning system as a whole, as evidenced by the capacity for morally injurious events (moral meaning threats) to create spiritual or existential conflict (including a subjective sense of meaninglessness; Jinkerson, 2016; Litz et al., 2009). Other aspects of the global meaning system, such as belief in a benevolent world or self-worth, can be affected (Litz et al., 2009). Given the noxious clinical implications of moral injury, it is critical to understand ways to bolster moral identity and protect the global meaning system against moral meaning making threats.

Belongingness

Another critical aspect of the global meaning system is belongingness — a network of relations between the self and the world such that people feel themselves to be an important part of the world (Heine et al., 2006; Stanley, Hom, Chu, Dougherty, Gallyer, Spencer-Thomas, Shelaf, Fruchter, Comtois, Gutierrez, Sachs-Ericsson, & Joiner, 2019). Belongingness is in part satisfied by interacting frequently, positively, and reciprocally with other people over a long period of time (Baumeister & Leary, 1995). Belongingness is also achieved by connecting to groups, objects, animals, and/or ideologies (Malone, Pillow, & Osman, 2012). Simply stated, belongingness is the need to create and sustain positive affiliations with the world and is generally operationalized as the level at which an individual believes this need is being met (Baumeister & Leary, 1995; Malone et al., 2012). As with any aspect of the global meaning system, resolving discrepancies between meaning threats and belongingness leads to positive outcomes. Unresolved discrepancies, however, can be deleterious.

Having a sense of belonging is related to positive health and psychological well-being (Armstrong, Shakespeare-Finch, & Shochet, 2016; Baumeister & Leary, 1995). For instance,

belongingness mediates the relationship between identity and well-being among members of the LGBTQIA+ community (Barr, Budge, & Adelson, 2016). Belongingness has also been found to cause increased perceptions of meaning, as well as mediate the relationship between certain beliefs and meaning in life (Moynihan et al., 2017). Belongingness is a source of social identity, value (e.g., positively contributing to others), and self-regulation (Moynihan, Igou, & van Tilburg, 2017). DeWall, Baumeister, and Vohs (2008), for example, found that people will regulate the speed and accuracy at which they play a game that requires fine motor skill in order to achieve a sense of belonging. In addition, belongingness is considered a fundamental protective factor against suicide (Van Orden, Wittle, James, Castro, Gordon, Braithwaite, Hollar, & Joiner, 2008). College students, for instance, are less likely to consider suicide if they endorse a sense of belongingness (Van Orden et al., 2008). Organizational belongingness, or the level at which people feel like they belong to their organization, is negatively correlated with depression and anxiety (Armstrong et al., 2016). Cockshaw and Shochet (2010) identified belongingness as a protective factor against depression in the workplace. For first responders (e.g., firefighters), belongingness buffers the effects of stress on posttraumatic symptoms, as well as attenuates PTSD severity (Armstrong et al., 2016; Stanley et al., 2019). Belongingness is also a key factor in the connection between the social world and physical health (Begen & Turner-Cobb, 2011). In adolescents, Begen and Turner-Cobb (2011) found that greater feelings of belongingness were associated with higher levels of positive mood and lower levels of aversive physical symptoms (e.g., headaches).

Conversely, lacking a sense of belongingness (i.e., thwarted belongingness) has negative physical and mental health implications. The allostatic load resulting from thwarted belongingness contributes to diminished immunocompetency and illness (Baumeister & Leary,

1995; Begen & Turner-Cobb, 2011). In young people with inflammatory bowel disease, thwarted belongingness mediated the association between illness severity and depressive symptoms (Gamwell, 2020). Thwarted belongingness is also a fundamental component of suicidal ideation and behavior, as noted in a number of investigations (Brailovskaia, Ujma, Friedrich, & Teismann, 2020; Van Orden et al., 2008). For example, in a German cohort, thwarted belongingness mediated the relationship between bullying and suicidal ideation (Brailovskaia et al., 2020). Similarly, in a sample of Iranian nurses, thwarted belongingness was a predictive factor for suicidal ideation (Damirchi, Mohammadi, & Amir, 2019). Thwarted belongingness also contributes to suicide risk in bereaved children and people with insomnia (Chu, Hom, Rogers, Stanley, Ringer, Podlogar, Hirsch, & Joiner, 2016; Hill, Kaplow, Oosterhoff, & Lane, 2019). Beside the well-identified risk of suicide, thwarted belongingness is also associated with anxiety, depression, negative emotionality (e.g., jealousy) and increased instances of psychopathology in general (Baumeister & Leary, 1995; Hill, del Busto, Buitron, & Pettit, 2018). Thus, belongingness is a critical aspect of the global meaning system and, like moral identity, its compromise can be deadly. Alternatively, bulwarking belongingness against meaning threats can promote psychological growth and positive psychological health.

Belief in a Just World

A third important facet of the global meaning system is belief in a just world (BJW). BJW, proposed by Lerner (1980) to be "a fundamental delusion", is the normative-ethical belief that people get what they deserve (Wenzel, Schindler, & Reinhard, 2017). Multiple dimensions of BJW have been identified.[4] General BJW is the extent to which people believe good things

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[4] There has been prolonged debate about how many dimensions of BJW there are (e.g., Lucas, Alexander, Firestone, and LeBreton (2007) identified at least a dozen single and multi-dimensional measures of BJW). The current study seeks to investigate a general sense of BJW, so reviewing each model of BJW is beyond the scope of this project. For now, it suffices to note the well-demonstrated assertion that people generally have beliefs about whether or not the world is a just place for themselves and others.

happen to good people and bad things happen to bad people (Wenzel et al., 2017). Personal BJW

is the level at which people believe one's own life is fair (Wenzel et al., 2017). In line with the

meaning-making model, the just-world theory states that people tend to have BJW in order to

make meaning of injustices and inequalities in life (i.e., BJW threats) (Wenzel et al., 2017).

Detecting BJW threats leads to distress and subsequent meaning-making efforts (Bartholomaeus

& Strelan, 2019; Dalbert, 2009). Such meaning-making efforts include assimilative strategies

like blaming the victim or blaming oneself for an injustice, as well as increasing the salience of

their belief in a just world (Dalbert, 2009).

Successfully making meaning of BJW threats leads to adaptive outcomes, such as

predicting and sustaining well-being across the lifespan (Bartholomaeus & Strelan, 2019;

Dalbert, 2009). This is particularly true for the personal dimension of BJW, which has been

shown to be more important than general BJW in relation to well-being (Dalbert, 2009). A recent

literature review conducted by Bartholomaeus and Strelan (2019) revealed that well-being,

positive affect, life satisfaction, less negative affect, and less depression are correlates of

personal BJW. In students, both dimensions of BJW are associated with greater life satisfaction,

less distress, better attitudes toward school, school enjoyment, and greater academic self-esteem

(Bartholomaeus & Strelan, 2019). Further, Bartholomaeus and Strelan (2019) found that personal

BJW is associated with greater quality of life and buffers against depression in older adults. For

survivors of disasters, Bartholomaeus and Strelan (2019) identified studies in which personal

BJW buffered against anxiety, depression, and distress — as well as served as a predictor of

psychological health. Finally, both dimensions of BJW are positive correlates of life satisfaction

and hope (Bartholomaeus & Strelan, 2019). Similar positive effects were observed in people

experiencing difficult life circumstances, such as bullying, as well as chronic physical illnesses

and mental health problems (Bartholomaeus & Strelan, 2019). Apart from acting purely as a buffering mechanism, successfully-maintained BJW functions as an underlying factor connecting beliefs and experiences to well-being. For instance, Zhang and Zhang (2015) found that BJW mediated the relationship between trust in societal institutions and well-being. Dalbert (2002) identified BJW as a protective factor against anger. Perhaps most significantly, BJW serves as a predictor of reduced mortality risk in older adults (Bartholomaeus & Strelan, 2019).

Contrarily, failing to reduce the discrepancy between BJW threats and BJW can compromise the global meaning system and lead to negative outcomes. For example, Schaafsma (2013) found that BJW mediates the relationship between discrimination and well-being, suggesting that failing to resolve BJW threats (e.g., experiencing discrimination) can damage well-being. Physiologically, failing to integrate BJW threats can result in heightened blood pressure — a risk factor for a multitude of adverse health outcomes (Eliezer, Townsend, Sawyer, Major, & Mendez, 2011). More generally, compromised BJW may result in greater occurrences of cardiovascular disease (Dalbert, 2002). Furthermore, repeated exposure to BJW threats such as frequent maltreatment can compromise BJW and produce negative emotionality, embitterment being one example (You & Ju, 2020). Finally, people with compromised BJW tend to self-ruminate, contributing to greater incidences of psychopathology like depression, anger, hostility, and aggression (Dalbert, 2002).

In sum, moral identity, belongingness, and BJW — which represent three main facets of the global meaning system (i.e., beliefs about the self, beliefs about the world, and beliefs about the self in relation to the world) — have positive effects on psychological and physical health when they remain intact. As with any aspect of the global meaning system, they help us to make sense of and navigate the world. When meaning-making processes fail to ameliorate the effects

of threats to meaning, significant physical and psychological damage can occur. Compromise of any facet of the global meaning system can adversely affect other facets; as multiple regions of the global meaning system are compromised, the entirety of one's global meaning system is at risk of failing. As discussed above, such damage on local (e.g., thwarted belongingness) and global (meaninglessness) levels places people at significant risk to deleterious outcomes such as suicidal ideation. It is therefore essential to understand the nature of meaning threats and how they interact with the global meaning system through meaning-making processes like fluid compensation. In the next two sections, two prominent meaning threats — mortality salience and absurd humor — are discussed, as well as their tendency to produce fluid compensation.

Mortality Salience

One of the most studied meaning threats in relation to fluid compensation is mortality salience (Heine et al., 2006). Derived from Terror Management Theory (TMT; Pyszczynski, Greenberg, & Solomon, 1999), mortality salience is the awareness of one's own death (see Burke, Martens, & Faucher, 2010 for a review). TMT states that, in order to avoid the distress resulting from mortality salience, humans compensate for their death with the belief that parts of themselves will symbolically or literally exist after they die (e.g., in heaven, their children, work, etc.; Burke et al., 2010). These beliefs are collectively referred to as symbolic or literal immortality (Arrowood, Cox, & Ekas, 2017; Burke et al., 2010; Heine et al., 2006). Immortality beliefs are a part of the global meaning system (or, synonymously, 'worldview') that buffers against the existential threat of death (Heine et al., 2006). In terms of the meaning-making model, events that elicit mortality salience produce fluid compensatory meaning-making processes that buffer the global meaning system against the existential threat. In TMT, fluid

compensatory effects of mortality salience are called *worldview defense* (Heine et al., 2006; see also Martens, Burke, Schumel, & Faucher, 2010).

Hundreds of experiments have examined worldview defense in a wide variety of cultures and populations (Burke et al., 2010; Florez, Schulenberg, & Stewart, 2016; Heine et al., 2006). For example, Heine and colleagues (2006) summarized experiments in which mortality salience primes have increased prejudice against outgroups, adherence to cultural norms, defense of cultural icons, and supernatural beliefs. Examples of mortality salience primes include watching videos of accidents, reading short stories relating to death, reading death-related words, being near a cemetery, being near a funeral home, and writing about death (among others; see Burke et al., 2010 for a review). Jost, Kruglanski, and Sullaway (2003) conducted a meta-analysis in which mortality salience primes made people more punitive toward criminals (cited in Burke et al., 2010). Burke and colleagues' (2010) meta-analysis of 164 studies revealed that mortality salience had an overall large effect on worldview defense. This work has shown that mortality salience is a meaning-threat that reliably produces fluid compensation.

In the years since, additional evidence for the fluid compensatory effects of mortality salience have been collected. For instance, in men, mortality salience led to an increase in motivation to obtain power (Belmi & Pfeffer, 2016). Individuals with autism spectrum disorder endorse greater worldview defense in response to mortality salience primes, suggesting that behavioral rigidity plays a role in mortality salience sensitivity (Arrowood et al., 2017). Bandt-Law and Krauss (2017) found that different kinds of mortality salience primes (self-based vs. trial-based) produced differential effects on juror's putative judgments of defendants with mental illness. Brandt-Law and Krauss' (2017) study suggest that different kinds of mortality

salience primes can elicit disparate fluid compensatory outcomes (i.e., bolstering one facet of the global meaning system as opposed to another).

Mortality salience primes have also been found to increase self-esteem, contributing to a tendency for participants to endorse a lower sense of negative emotionality (particularly regret; Rudert, Reutner, Walker, & Greifeneder, 2015). These results suggest that, in line with the meaning-making model, fluid compensation reduces the distress of mortality salience. Accordingly, those lacking psychological buffers against mortality salience experience heightened anxiety and diminished well-being (Juhl & Routledge, 2016).

Absurd Humor

In relation to mortality salience, absurd humor is a far less studied meaning threat. As discussed above, meaning threats are events that violate expectations generated from the global meaning system and generate negative arousal (Park, 2010). According to Debugging Theory (Hurley, Dennet, & Adams, 2011) mirth belongs to a class of emotions that are designed by evolution to protect the integrity of the global meaning system (which is referred to by Hurley and colleagues as the *global belief system* or *world representation*). Mirth, the pleasurable feeling associated with humor, occurs when an expectation generated by the global meaning system is found to be false via new information that is in itself valid with the world (Hurley et al., 2011). Mirth protects the global meaning system by rewarding and encouraging the brain to detect and resolve errors made by its own predictive mechanisms (Hurley et al., 2011). Such a conception is consistent with most existing theories of humor, which state that incongruity is essential (Hurley et al., 2011; Proulx et al., 2010). Since prototypical humor produces positive arousal by ultimately resolving incongruity (via a punch-line; Proulx et al., 2010), it is generally not considered a threat to meaning. Absurd humor, alternatively, does not restore meaning to

incongruities (Proulx et al., 2010). Absurd humor occurs when an expectation generated by the

global meaning system is found to be false via new information that is *invalid* with the world.

Absurd jokes, by rule, do not end in punchlines that resolve expectancy violations (Hurley et al.,

2011; Proulx et al., 2010).[5] As a result, absurd humor often produces a negative arousal state and

subjective feelings of uncanniness, angst, dissonance, uncertainty, and meaninglessness (Proulx

et al., 2010). Absurd humor is therefore a quintessential threat to meaning.

To date, only one study has investigated the fluid compensatory effects of absurd humor.

Proulx, Heine, and Vohs (2010) used an absurd Monty Python story called *Biggles: Pioneer Air*

Fighter to elicit fluid compensation. *Biggles* is an absurd, sexually-laden parody of wartime

British children's stories in which British fighter pilots contend with the Red Baron (see

Appendix C for an abbreviated version of the story provided by Proulx et al., 2010). Proulx and

colleagues (2010) found that participants who read *Biggles* without being told it was a joke

experienced it as a threat to meaning. As a result, the participants who had read *Biggles* affirmed

an unrelated aspect of their global meaning system (i.e., their Social Judgment Survey scores

were higher) (Proulx et al., 2010). Crucially, participants who had read a traditional humorous

story, had been told *Biggles* was a joke beforehand, or experienced *Biggles* as being subjectively

funny did not fluid-compensate. These results suggest that humor is a specific kind of

meaning-making process — experiencing meaning threats as humorous (or an attempt at humor)

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[5] Here is an example of a prototypical joke, which creates an expectation and violates it with a punchline that is equally valid: "I spilled spot remover on my dog. Now he's gone." -Steven Wright.

Here is an example of an absurd joke, which creates an expectation but doesn't end in a valid punchline: "Why did the rabbit eat the carrot? Because he saw a red cat watching TV." Instead of the punchline violating one's expectation generated by the "set up", the joke is constructed so that one's expectation about how one's expectation is supposed to be violated is violated. Absurd humor is therefore a form of metahumor, or humor about humor.

diminishes the threat. Conversely, absurd humor elicits fluid compensation when meaning has not been made (Proulx et al., 2010).

In a broader context, empirical research on how humor relates specifically to the meaning-making model is nearly non-existent. Consistent with Proulx and colleagues, Davis (2016) garnered tentative support for the hypotheses that humor mitigated the distress of meaning-related threats, as well as contributed to well-being and meaning in life. The lack of research on humor as it relates to the meaning-making model is astonishing given that humor is associated with well-being and successfully coping with stressful experiences (Davis, 2016). Moreover, humor has been recognized as an essential component of meaning in life for at least a century (see, e.g., Frankl, 1959/2006), prompting calls for further investigation (Davis, 2016; Proulx et al., 2010).

Summary

Thus far we have seen that people possess a sense of meaning in life. Meaning in life is a product of successful meaning making. Park's (2010) model postulates that successful meaning-making amounts to reducing the discrepancy between events in the world and one's global meaning system. The global meaning system is one's inner representation of the world and therefore contains the entirety of one's belief system. It can be conceptualized as consisting of three main domains: beliefs about the world, beliefs about the self, and beliefs about the self in relation to the world. Moral identity (a belief about the self), belongingness (a belief about the self in relation to the world), and BJW (a belief about the world) are representative of each of these domains. Furthermore, threats to meaning (i.e., events that violate domain-specific expectations and challenge beliefs) can cause damage to one's global meaning system which, in turn, may lead to poor physical and mental health. Examples of such threats to meaning are

mortality salience and absurd humor. Automatic meaning-making processes, such as fluid compensation (i.e., the temporary bolstering of beliefs that are unrelated to the belief under threat) help extinguish meaning threats. Both mortality salience and absurd humor produce fluid compensation, though absurd humor has been far less investigated. Moreover, humor appears to be a unique meaning-making process, as meaning threats which are experienced as being funny do not elicit fluid compensation. Since only a single study has investigated this phenomenon (Proulx et al., 2010), further research is needed to substantiate the role of humor in meaning-making.

Present Study

To date, knowledge of the fluid compensatory effects of absurd humor on multiple aspects of the global meaning system is dismal. The same holds true for humor that elicits mortality salience. In fact, little research has investigated fluid compensation without using the Social Judgement Survey. As such, the extent to which meaning threats like absurd humor and mortality salience produce fluid compensatory effects on multiple beliefs remains understudied. In addition, though the moderating effects of distress tolerance (i.e., the ability to experience and endure negative psychological states; Simons & Gaher, 2005) and fluid compensation have been indirectly supported (e.g., Randles, Heine, & Santos, 2013), distress tolerance has not been empirically verified as a moderator between meaning-related threats and fluid compensation. Similarly, the nature of subjective ratings of funniness on fluid compensation have not been investigated (i.e., it is not known whether humor is a moderator or mediator). Lastly, fluid compensatory effects on global perceptions of meaning in life have, to this researcher's knowledge, not been systematically investigated.

The goal of the present study was to address these gaps in the literature by examining the fluid compensatory effects of absurd humor and mortality salience on moral identity, belongingness, BJW, and meaning in life. Additionally, the present study aimed to further substantiate the role of humor in meaning making. It was hypothesized that:

1. Unexpected absurd humor would elicit compensatory affirmation of moral identity, belongingness, BJW, and meaning in life.

2. Expected absurd humor would not elicit fluid compensatory affirmation of moral identity, belongingness, BJW, or meaning in life.

3. Mortality salience would elicit compensatory affirmation of moral identity, belongingness, BJW, and meaning in life.

4. Both unexpected and expected mortality-salient absurd humor would elicit fluid compensatory affirmation of moral identity, belongingness, BJW, and meaning in life.

5. Unexpected mortality-salient absurd humor would elicit the strongest fluid compensatory effects.

6. If fluid compensation is detected, there would be a moderating effect of distress tolerance on fluid compensation.

7. If fluid compensation is detected, there would be a moderating or mediating effect of how funny participants rate each condition on any fluid compensatory effects.

In line with previous research (e.g., Proulx et al., 2010) fluid compensation was measured as the extent to which participants in experimental conditions endorse moral identity, belongingness, BJW, and meaning in life relative to a control group (Zoo; see below).

II.   METHOD

Participants

An a-priori power analysis for MANOVA revealed that 96 participants would be needed to detect a medium effect with six groups and four response variables ($f^2 = .06$; $\alpha = .05$; $1 - \beta = .80$). However, since univariate analyses of variance may be used to reveal differences between groups during subsequent analyses, more participants may be needed (Tabachnick & Fidell, 2013). An a-priori power analysis for ANOVA revealed that 216 participants would be needed to detect a medium effect with six groups ($f = .25$; $\alpha = .05$; $1 - \beta = .80$). Therefore, the current study aimed to recruit at least 216 participants.

Participants ($N = 590$) were recruited via Mechanical Turk (MTURK), an Amazon Web Service for Human Intelligence Tasks (HITs). Amazon Web Services and its subsidiaries are considered a reliable and effective platform for collecting data in the behavioral sciences (Levay, Freese, & Druckman, 2016; Litman, Robinson, & Abbercock, 2017). MTURK also has the benefit of providing access to participants generally not represented in typical convenience-based college student samples and is therefore thought to be a more representative recruitment tool than other platforms (Levay et al., 2016). In the current study, participants responded from North America, Europe, and Southeast Asia. The majority of participants identified as male ($n = 339$; 57.5%), while 36.8% identified as female ($n = 217$), and 5.8% of cases pertaining to biological sex were not indicated ($n = 34$). The average age of participants was 34.76 years (minimum age = 18, maximum age = 78). In terms of race/ethnicity, 58% of participants identified as White ($n = 346$), 8% identified as Black ($n = 48$), 1% identified as Native American or Alaska Native

(n = 6), 24.6% identified as Asian (n = 163), 0.2% identified as Native Hawaiian or Pacific

Islander (n = 1), 1% identified as LatinX (n = 6), and 0.7% identified as "Other" (i.e., "mixed",

"multiracial") (n = 4). As for highest level of education received, the majority of participants

reported having earned a bachelor's degree (55.4%; n = 342), 4.4% of participants noted they

had earned a high school diploma (n = 27), 6.2% noted having some college experience but no

college degree (n = 38), 4.7% noted having earned an associate degree, 20.4% noted having

earned a master's degree (n = 125), 0.3% noted having earned a doctoral degree (n = 2), 0.7%

noted having earned a professional degree (e.g., J.D., M.D.) (n = 4), and 8% of cases did not

indicate education level (n = 48). Participants were paid $0.50 for their participation via

MTURK. Prior to data collection, the study was approved by the University of Mississippi's

(UM's) Institutional Review Board and the study design was consistent with Helsinki standards.

Measures

  Self-Importance of Moral Identity Scale. The Self-Importance of Moral Identity Scale

(SIMIS; Aquino & Reed, 2002; see appendix I) is a 10-item self-report measure used to assess

moral identity (see, e.g., Reed & Aquino, 2003). It utilizes a 5-point Likert-type response format

(1 = *strongly disagree*, 5 = *strongly agree*; items 4 and 7 are reverse-coded). The SIMIS

measures the extent to which participants identify with nine empirically-derived moral traits:

caring, compassionate, fair, friendly, generous, helpful, hardworking, honest, and kind. Items are

organized into two subscales: internalization and symbolization. Items 1, 2, 4, 7, and 10

comprise the internalization subscale, whereas items 3, 5, 6, 8, and 9 comprise the symbolization

subscale. Scores from both subscales can be summated into a general moral identity score. Total

scores on the SIMIS range from 10-50, with higher scores indicating greater overall endorsement

of moral identity.

The SIMIS exhibits good psychometric properties. Exploratory and confirmatory factor analyses support a two-factor structure (Aquino & Reed, 2002). The internalization and symbolization subscales demonstrate good reliability (Cronbach's alphas of .83 and .82, respectively) and are modestly correlated (r = .41, p < .001) (Aquino & Reed, 2002). The convergent validity support for the SIMIS is adequate; both subscales are weakly to moderately correlated (rs = .18 - .32) with theoretically related constructs (Aquino & Reed, 2002). Furthermore, internalization and symbolization scores are correlated with external judgements of self-content (rs = .39 and .28, respectively, ps < .001) and predict self-reporting volunteer activities (β = .32 and β = .28, respectively, ps < .001). Internalization also predicts actual donating behavior (β = .25, p < .05), providing further evidence of construct validity (Aquino & Reed, 2002).

General Belongingness Scale. The General Belongingness Scale (GBS; Malone et al., 2011; see Appendix J) is a 12-item self-report measure designed to assess a general sense of belonging. It utilizes a 7-point Likert-type response format (1 = *strongly disagree*, 7 = *strongly agree*). The scale is organized into two, six-item subscales: acceptance/inclusion (e.g., "When I am with other people I feel included") and rejection/exclusion (e.g., "I feel like an outsider"). Items on the rejection/exclusion subscale are reverse-scored. Scores on the GBS range from 12 to 84, with higher scores indicating a greater endorsement of general belongingness.

The GBS exhibits strong psychometric properties. Exploratory and confirmatory factor analyses reveal a two-factor structure (Malone et al., 2011). GBS scores demonstrate excellent reliability (Cronbach's α = .95) (Malone et al., 2011). Convergent validity is demonstrated via a strong negative correlation with neuroticism (r = -.51) and strong positive correlations with positive personality traits (e.g., emotional stability and extraversion; rs = .41 and .50,

respectively, ps < .05) (Malone et al., 2011). Incremental validity has also been established, as the GBS explained incremental variance for life satisfaction and happiness controlling for other related measures (Δr^2 = 5.4% - 10.3%) (Malone et al., 2011).

Distress Tolerance Scale. The Distress Tolerance Scale (DTS; Simons & Gaher, 2005; see Appendix K) is a 15-item self-report measure designed to assess one's ability to tolerate and experience negative psychological states (e.g., "Feeling distressed or upset is unbearable to me", "When I feel distressed or upset, all I can think about is how bad I feel"). The original scale utilizes a 5-point Likert-type response format (1 = *strongly agree*, 5 = *strongly disagree*). For the purpose of the current study, the response format was reversed (1 = *strongly disagree,* 5 = *strongly agree*). Item 6 is reverse-coded ("I can tolerate being distressed or upset as well as most people"). Total DTS scores range from 15 to 75, with higher scores typically indicating greater endorsement of general distress tolerance. Since the response format was reversed in this study, higher scores indicate a lower ability to tolerate distress. Total DTS scores therefore reflect *lack of distress tolerance*.

DTS scores evidence strong psychometric properties. Exploratory and confirmatory factor analyses reveal a general distress tolerance factor (Simons & Gaher, 2005). The scale demonstrates good reliability (Cronbach's a = .82) and test-retest reliability over a 6 to 8 week timeframe (r = .61). DTS scores have also been found to positively correlate with measures of mood acceptance (r = .47) and mood regulation (r = .54) and negatively associate with measures of substance use (r = -.23 for alcohol and r = -.20 for marijuana) (Simons & Gaher, 2005). DTS scores are also negatively correlated with measures of affect distress (r = -.59) and dysregulation (r = -.51), providing additional evidence for convergent and discriminant validity (Simons & Gaher, 2005).

Global Belief in a Just World Scale. The Global Belief in a Just World Scale (GBJWS; Lipkus, 1999; see Appendix L) is a 7-item self-report measure that utilizes a 6-point Likert-type response format (1 = *strongly disagree*, 6 = *strongly agree*). The GBJWS measures the extent to which individuals believe the world is a fair place with respect to themselves and others (e.g., "I feel that people get what they are entitled to have", "I basically feel that the world is a just place"). Scores on the GBJWS range from 7 to 42, with higher scores indicating greater general endorsement of BJW.

The GBJWS exhibits good psychometric properties and is considered to be more precise than other existing measures of BJW (Hellman, Muilenburg-Trevino, & Worley, 2008). Confirmatory factor analysis indicates that the GBJWS measures a single construct (Lipkus, 1999; Reich & Wang, 2015). In terms of reliability, the mean reliability coefficient for the GBJWS is in excess of .80 over 20 studies (Hellman et al., 2008). Moreover, GBJWS scores also exhibit moderate to strong internal consistency reliability across gender and culture (Cronbach's as = .78-.90).

The Meaning in Life Questionnaire - Presence Subscale. The Meaning in Life Questionnaire (MLQ; Steger, et al., 2006; See Appendix M) is a 10-item self-report measure designed to assess the presence of meaning in one's life (e.g., "I understand my life's meaning"), as well as how motivated one is to search for meaning in their life (e.g., "I am searching for meaning in my life"). It utilizes a 7-point Likert-type response format (1 = *Absolutely Untrue,* 7 = *Absolutely True*). Item 9 is reverse-coded (e.g., "My life has no clear purpose"). The measure is organized into two subscales: presence of meaning (Presence; MLQ-P) and search for meaning (Search; MLQ-S). Scores for the Presence and Search subscales range from 5 to 35. Higher scores on each subscale indicate greater endorsement of presence of meaning and search for

meaning, respectively. Given that an aim of the current study was to measure fluid compensatory effects of mortality salience and absurd humor on meaning in life, the Presence subscale (MLQ-P) was utilized in the statistical analyses. Steger and colleagues (2008) found scores on the MLQ-P typically approximate 24 in American respondents.

The MLQ demonstrates excellent psychometric properties. Exploratory and confirmatory factor analyses support a two-factor structure (Naghiyaee, Bahmani, & Asgari, 2020; Schulenberg, Strack, & Buchanan, 2011; Steger et al., 2006). The Presence (Cronbach's $a = .82$) and Search (Cronbach's $a = .88$) subscales also demonstrate good reliability (Steger et al., 2006). Additionally, test-retest reliability is good (.70) over a one-month period (Steger et al., 2006). The Presence subscale is positively correlated with measures of life satisfaction, positive emotions, intrinsic religiosity, extraversion, and agreeableness (rs = .23 - .49) and negatively correlated with measures of depression, negative emotions, and neuroticism (rs = -.17 to -.48) (Steger et al., 2006). Since 2006, several additional studies have corroborated the MLQ's strong psychometric properties (see, e.g., Naghiyaee et al., 2020; Schulenberg et al., 2011).

Procedure

To help ensure the quality of data collected on MTURK, participants were required to have a 95% approval rating, 100 completed HITs, and be 18 years of age to participate in the study (Litman, Robinson, & Abbercock, 2017). Potential participants who did not match one or more of these criteria did not have the ability to access the study on their MTURK accounts. Once participants chose to participate in the study on MTURK, they were redirected via hyperlink to a Qualtrics survey. When they opened the link, participants had the opportunity to consent to the study, confirm their age, fill out a series of demographic questions, complete an attention check (Oppenheimer, Meyvis, & Davidenko, 2009; see Appendix A), and fill out a

DTS (Distress Tolerance Survey). They were then randomly assigned to one of six reading conditions: expected Biggles, unexpected Biggles, Mortality Salience, expected Mortality Biggles, unexpected Mortality Biggles, and Zoo (described briefly below, see Appendices C-H for a complete set of stimulus materials). In each condition, participants were instructed to read a story, pausing for 10 seconds upon completion to visualize what they had read. After completing a question about whether or not they participated in the visualization task, participants rated how funny they perceived the story (1 = *not at all funny*, 9 = *extremely funny*). Next, participants in all conditions were asked to complete a second attention check (Oppenheimer et al., 2009; see Appendix B), as well as the global belief in a just world scale, the self-importance of moral identity scale, the global belongingness scale, and the meaning in life questionnaire (described above and presented as Appendices G-K). The order of measure presentation was randomized following the attention check in an effort to control for potential confounds (e.g., order effects). At the end of the survey, participants were given an opportunity to re-consent following a brief description of how they may have been deceived (i.e., participants were notified that they may have been randomly assigned to read a passage that incorrectly stated that *Biggles* was not meant to be a joke, see below).

In the expected Biggles condition, participants read a modified version of *Biggles: Pioneer Airfighter* (from Proulx et al., 2010), which was preceded by a paragraph explaining that what participants were about to read is a joke written by comedy troupe Monty Python (see Appendix C).

In the unexpected Biggles condition, participants read a modified version of *Biggles: Pioneer Airfighter* (modified from Proulx et al., 2010), which was preceded by a paragraph explaining that what participants were about to read is an adventure story for young children

written by W. E. Johns (see Appendix D). Of note, a potential confound in Proulx and colleagues' original (2010) study is the mentioning of death in their unexpected Biggles condition. Prior research on mortality salience indicates that words related to death can elicit mortality salience and subsequent fluid compensation (i.e., *worldview defense*; Martens et al., 2011). For this reason, the preceding paragraph in both "unexpected" Biggles conditions have been modified to exclude the words " — when most pilots died in their first combat and before devices such as respirators and parachutes had become practical."

In the expected/unexpected mortality Biggles conditions, the procedure was the same as outlined above, except each story ended with the characters dying in a plane crash: "Then the plane fell out of the sky and exploded as it hit the ground. Everyone died, and so will you." (see Appendices E and F).

Prior research indicates that reading an excerpt from a story in which the character dies elicits mortality salience (Martens et al., 2011). Thus, in the mortality salience condition (Tolstoy), participants read an excerpt from Leo Tolstoy's *The Death of Ivan Ilyich* (Tolstoy, 1886/1973). In this excerpt, Tolstoy vividly described the experience of death as Ivan Ilyich, surrounded by his weeping family, gasps for air as he dies. The story was preceded by a paragraph explaining that what participants were about to read is a story about death written by Leo Tolstoy (see Appendix G).

Finally, in the Zoo condition, participants read a traditionally-humorous story about a zoo owner, adapted from Proulx and colleagues (2010). In this story, a mime and a lion both "work" at a zoo. The mime makes a show of taunting the lion until he accidentally slips into the lion's cage. Before eating the mime, the lion warns him to not make noise, lest they are both "fired" from their jobs (see Appendix H).

III.   RESULTS

Data Cleaning and Assumption Testing

Prior to analysis, the data were screened for failed attention checks or respondents

declining to consent to the study. As a result, 243 participants were excluded from the study.

Response times for the remaining 347 participants were calculated, revealing that the median

duration for completing the survey was 9.93 minutes. Given that statistically unusual response

times (e.g., under the 5th percentile or over the 95th percentile) are indicative of inattentiveness

and other confounding participant characteristics on MTURK (see Hauser, Paolacci, & Chandler,

2019), 34 cases falling outside of the 5th ($t < 4.57$ minutes) and 95th percentiles ($t > 34.7$

minutes) were excluded from subsequent statistical analyses. The remaining 313 participants

were tested for assumptions with respect to multivariate analysis of variance (MANOVA)

procedures. Five cases were identified as multivariate outliers using the Mahalanobis distance

criteria for $\chi^2 = 22.46$, $df = 6$, $p = .001$ and subsequently removed from further analyses. In total,

308 cases (52%) were retained for analyses and 282 cases (48%) were excluded from the study.

Since a significant portion of cases were excluded from subsequent analyses, demographics for

the remaining participants were calculated and are presented in Tables 1a-1f.

Subsequent bivariate Pearson correlations revealed no problems with multicollinearity

for the remaining 308 participants ($0.2 < r$s < 0.8, ps $< .001$). The skewness statistic for each

dependent variable fell into an acceptable range: belief in a just world (GBJWS) = -.752; moral

identity (SIMIS) = -.487; belongingness (GBS) = .259; Presence of Meaning (MLQ-P) = -.818.

These data indicate that a MANOVA and related analyses would not be affected by the extent to

which the distribution of each outcome variable is skewed (Hair, Black, Babin, & Anderson, 2010; Kim, 2013). Similarly, Box's M was statistically significant ($F(50, 157967) = 1.84$, $p <$ .001; $\chi^2 = 95.26$), indicating that the observed covariance matrices of the dependent variables were not equal across groups. However, since the sample size of each reading condition was more than 30, a MANOVA would not be affected given the central limit theorem (Allen & Bennett, 2008). Further, Levene's test was statistically significant for the GBS ($F(5,302) = 2.60$, $p = .025$), suggesting that the error variances of these measures were not equal across one or more groups (see Table 3). Since homogeneity of variance cannot be assumed for the GBS, post hoc tests for MANOVA (i.e., ANOVA, Tukey HSD) were interpreted at the $p < .001$ level (Allen & Bennett, 2008).

Descriptive Statistics

Means, variances, standard deviations, and reliability coefficients were calculated for distress tolerance (DTS: x̄ = 49.54; s = 12.54; Cronbach's α = .91), belongingness (GBS: x̄ = 28.92; s = 6.89; Cronbach's α = .86), belief in a just world (GBJWS: x̄ = 36.25; s = 6.05; Cronbach's α = .75), moral identity (SIMIS: x̄ = 55.84; s = 10.87; Cronbach's α = .76), and meaning in life (MLQ-P: x̄ = 24.86; s = 5.14; Cronbach's α = .59). The Cronbach's α for each scale indicated that internal consistency reliability ranged from sufficient to excellent across all measures (Tabachnick & Fidell, 2013). Descriptive statistics for the number of participants in each experimental condition are presented in Table 2.

Funniness Ratings

Zoo was perceived to be the funniest reading condition ($\bar{x}$ = 7.16; s = 2.33; minimum = 1, maximum = 9; n = 49), followed by Expected Mortality Biggles ($\bar{x}$ = 6.26; s = 2.0; minimum = 1, maximum = 9; n = 47), Expected Biggles ($\bar{x}$ = 6.20; s = 2.20; minimum = 1, maximum = 9;

n = 49), Unexpected Mortality Biggles ($\bar{x}$ = 6.00; *s* = 2.31; minimum = 1, maximum = 9; *n* = 48), Unexpected Biggles ($\bar{x}$ = 5.54; *s* = 2.10; minimum = 1, maximum = 9; *n* = 63), and Tolstoy ($\bar{x}$ = 4.50; *s* = 1.52; minimum = 1, maximum = 9; *n* = 52). A one-way between subjects ANOVA was conducted to compare the effect of reading condition on average funniness rating. As expected, there was a statistically significant effect of reading condition on funniness rating ($F_{(5, 302)}$ = 8.14, *p* < .001). However, Tukey HSD post-hoc comparisons revealed that, while Zoo was perceived to be the funniest story and Tolstoy was perceived to be the least funniest story, the mean differences between each Biggles condition were not statistically significant (see Table 4 for additional information). This finding suggests that both mortality salience and expectedness (i.e., expecting *Biggles* to be a joke vs. not expecting *Biggles* to be a joke) did not affect how funny participants found *Biggles*. Rather, all Biggles conditions elicited approximately the same amount of perceived humor.

Hypothesis Testing

A MANOVA was conducted to assess hypotheses 1 through 5. There was not a statistically significant difference between scores for the SIMIS, the GBS, the BJW, and the Presence subscale of the MLQ ($F_{(29, 993)}$ = .86, *p* = .644; partial η^2 = .014; see Table 5), suggesting that participants' average endorsement of moral identity, belongingness, BJW, and meaning in life was not affected by reading condition. There were no statistically significant mean differences between Zoo and other reading conditions on belief endorsement.

However, given that Levene's test was statistically significant for the GBS (see above), it is possible that, instead of globally increasing their average endorsement of belongingness scores, participants within each condition *decreased and increased* their respective endorsement of belongingness following the manipulation (thereby eliminating statistically significant mean

differences between groups). In other words, though there was not a unidirectional effect of reading condition on belief affirmation, participants may have yielded more extreme scores on either end of the distribution. Since variance tests can account for such bidirectional effects, fluid compensation may be detected via statistically significant F values, where:[6]

$$If\ the\ variance\ of\ Zoo\ >\ the\ variance\ of\ group\ X,\ then\ F\ =\ \frac{Variance\ of\ Zoo}{Variance\ of\ X},\ else\ F\ =$$

$$\frac{Variance\ of\ X}{Variance\ of\ Zoo}$$

However, the proportion of variances between Zoo and other reading conditions did not reveal significant differences (see Table 6 for additional information). Thus, hypotheses 1 through 5 were not supported. Since fluid compensation was not detected, it was not possible to test hypotheses 6 and 7.

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[6] Matthews, personal communication.

IV.   DISCUSSION

Humor as a Meaning-Making Process

Over a decade ago, Proulx and colleagues (2010) found that perceiving meaning threats to be funny decreases people's tendency to fluid compensate, suggesting that perceptions of meaning can be made through humor. The aims of the current study were to (1) expand on Proulx and colleagues' (2010) work in order to substantiate the role of humor and distress tolerance in meaning making and (2) investigate fluid compensatory processes on multiple aspects of the global meaning system. However, fluid compensation was not detected in the current data. Participants' average endorsement of moral identity, belongingness, belief in a just world, and meaning in life was not affected by reading condition. Since fluid compensation was not detected, the mediating and/or moderating effects of distress tolerance and humor on fluid compensatory processes remains a fruitful direction for research. In addition, it is still an open question as to how fluid compensation affects multiple aspects of the global meaning system. Nevertheless, the results garnered in the present study have two fruitful implications for humor and meaning-making research.

In Proulx and colleagues' (2010) original study, participants in the unexpected Biggles condition fluid compensated. The authors attributed this effect to *expectedness* — participants who were not prepared for unexpected Biggles' incongruities supposedly experienced it as a meaning threat. However, as mentioned above, a potential confound in Proulx and colleagues' (2010) work is the mentioning of death in their unexpected Biggles condition, which may have been sufficient for producing fluid compensation independent of expectedness

(Martens et al., 2011). In the current study, this confound was controlled for by splitting *Biggles* into a mortality salience condition and a condition in which mortality salience was absent. In addition, a "pure" mortality salience condition was added (i.e., Tolstoy; a condition in which someone dies and the stimulus is not structured like a joke).

In line with Proulx and colleagues (2010), it was expected that participants who found their respective reading condition funny would not fluid compensate — instead, they would have made sense of the stimulus by deriving humor from it. Indeed, each Biggles condition was found to be considerably humorous; on average, participants found *Biggles* to be funny (6 on a 9-point Likert-like scale) regardless of expectedness and mortality salience. Accordingly, fluid compensation was not detected in any of the absurd humor conditions. This finding indicates that *Biggles* did not elicit fluid compensation because participants in the current sample made sense of the meaning threat through humor (Proulx et al., 2010). Furthermore, participants found Tolstoy moderately humorous (4.5 on a 9-point Likert-like scale) and did not fluid compensate. Together, these data imply that humor is a mechanism by which at least two meaning threats (absurd humor and mortality salience) are assuaged. High funniness ratings across experimental conditions and lack of fluid compensation in response to mortality salience and absurd humor suggest that humor is a meaning-making process.

Bidirectional Fluid Compensation

In addition to providing empirical evidence for the existence of humor as a meaning-making process, results from the present study suggest that it is theoretically possible for fluid compensation to produce bidirectional effects on belief endorsement. Though fluid compensation was not detected in the current data, relatively unequal variances of belongingness scores across conditions suggested that upon encountering a meaning threat, it is possible for

people within to endorse believing a belief *less*, while others may endorse believing a belief *more*. Namely, instead of bolstering beliefs in a single direction (Heine et al., 2006), fluid compensation may be an automatic process which amplifies the relative degree to which people are confident in their beliefs.

A methodological implication for meaning-making research arises from this possibility. Traditional (unidirectional) fluid compensatory effects may be detected by measuring statistically significant mean differences in belief endorsement relative to a control group (e.g., ANOVA and follow-up Tukey HSD tests). However, bidirectional fluid compensatory effects may be detected by measuring statistically significant differences in variance of belief endorsement relative to a control group (e.g., via Levene's test for equality of variance and follow-up F-tests). To this researcher's knowledge, the present study is the first to examine fluid compensation in this manner. Research examining bidirectional effects on belief endorsement may help clarify the nature of fluid compensation. For instance, detecting bidirectional fluid compensation would indicate that it is not a belief itself that is bolstered, but people's relative confidence that a belief is true or false. Below, additional suggestions for humor and meaning-making research are offered.

Suggestions for Research

The existence of humor as a meaning-making process has important implications for both meaning-making research and clinical practice. As discussed in depth above, ameliorating meaning threats is critical to mental and physical health. However, it is not known whether humor (1) assuages the distress caused by meaning threats (e.g., as an emotion regulation strategy), (2) makes sense of meaning threats by explaining them as humorous (e.g., as a meta-representation of the nature of such discrepancies), or (3) some combination of both. Future

meaning-making research will benefit by first corroborating humor as a meaning-making process and then clarifying the mechanisms by which humor ameliorates meaning threats.

Furthermore, understanding humor as a meaning-making process may generate insight into the etiology and clinical applicability of different forms of humor. Actively seeking and fostering meaning threats through the use of humor may make other meaning threats more appetitive, thereby affording an adaptive advantage for individuals in challenging circumstances. The well-documented prevalence of gallows humor in Nazi concentration camps (Carpenter, 2010), police work (Gayadeen & Philips, 2016), firefighting (Dangermond, Weewer, Duyndam, & Machielse, 2022), and medicine (Watson, 2011) attest to this possibility. Indeed, Frankl claimed that "humor, more than anything… can afford an aloofness and an ability to rise above any situation, even if only for a few seconds" and that humor was ubiquitously essential for prisoners' survival during the Holocaust (Frankl 1959/2006, p. 63). Since humor is a teachable skill (Tagalidou, Loderer, Distlberger, & Laireiter, 2018), Frankl's "aloofness and ability to rise above any situation" can readily be fostered in a wide range of clinical settings (e.g., community mental health clinics and post-disaster scenarios). Thus, research investigating and refining humor as a behaviorally-based means to increase resiliency and bolster the efficacy of clinical interventions is needed. Relatedly, it will be useful for so-called maladaptive humor to be conceptualized and investigated as a source of strength and acceptance rather than a symptom of mental health challenges (e.g., Lu, Jiang, Jua, & Jiang, 2020).

As mentioned above, how fluid compensation affects multiple aspects of the global meaning system remains largely unknown. The current study is among the first to utilize both first-order and meta-beliefs while investigating fluid compensation. For instance, meaning in life is a meta-belief (i.e., a multi-dimensional belief *about* one's belief system), whereas

belongingness, moral identity, and belief in a just world are first-order beliefs (i.e., beliefs *in* one's belief system; or beliefs about the self, the world, and the self-in-relation to the world). Further investigation as to how fluid compensation affects multiple aspects of the global meaning system may help clinical researchers understand pathways to meaninglessness (or existential crisis; Butėnaitė, Sondaitė, & Mockus, 2016) and its subsequent resolution. For example, it is possible that meaning threats produce disparate effects on meta-beliefs (e.g., "I can know things about the world") compared to first-order beliefs (e.g., "people tend to be fair"). Given the design architecture of the brain, meaning-making processes might occur faster for first-order beliefs than for meta-beliefs (see Clark, 2013). Similarly, it is possible that threats to meta-beliefs are more distressing than threats to first-order beliefs and therefore more likely to undermine perceptions of meaning (Heine et al., 2006).

Study Strengths and Limitations

The current study is among the first to utilize psychometrically validated measures of multiple beliefs to measure fluid compensation (instead of the Social Judgement Survey, which purportedly measures whether people think prostitution is wrong), allowing for the possibility of exploring multiple facets of the global meaning system at once. In addition, the current study is among the first to investigate meaning-making processes in a non-college-based convenience sample. Having responded from Europe, North America, and Southeast Asia, participants were more culturally diverse than a typical undergraduate psychology class. As evidenced by tables 1a through 1f, the current sample of MTURK workers were more educated, older, and more representative in terms of race, sexual orientation, and marital status than typical college students.

Two limitations to the current study must be noted. First, the current study occurred during the COVID-19 pandemic — a time when mortality salience was perhaps at its highest level in remembered history (Evers, Greenfield, & Evers, 2021). Given that mortality salience has a variety of effects on people's behavior and cognition (Burke et al., 2010), it is simply not possible to know how COVID-19-related mortality salience affected the results of the current study. It is feasible, for instance, that participants found Tolstoy funny because they were already primed with mortality salience. Since the effects of the COVID-19 pandemic on the current study cannot be accounted for, it must be noted as a potential confound.

Second, the current study did not control for English-language competency. Since humor manipulations are strongly dependent on linguistic and cultural idiosyncrasies (Hurley et al., 2010), failing to control for English-language competency may have added statistical "noise" to the results of the present study. For instance, it is feasible that some participants knew enough English to recognize attention checks and the presence of a joke, but not enough English to activate the appropriate expectations necessary for the elicitation of mirth. Thus, funniness ratings may have reflected participants reacting to perceived demand characteristics instead of genuine humor. If this were the case in the current sample, low intraindividual response variability in humor ratings across reading conditions would have been observed. However, the data cleaning procedure described on pages 36 and 37 above served to increase the intraindividual response variability of humor ratings, indicating that the above concern is unlikely.

In sum, the current study set out to investigate the fluid compensatory effects of absurd humor and mortality salience on moral identity, belongingness, belief in a just world, and meaning in life, as well as substantiate the role of humor in meaning making. Fluid

compensation was not detected. Tellingly, participants tended to find humor in each reading funny — including a pure mortality salience condition in which the stimulus was not structured like a joke. Consistent with prior research by Proulx and colleagues (2010), these results indicate that participants found meaning through the use of humor. This study therefore provides empirical evidence that humor is a meaning-making process. Humor and meaning-making research will benefit by further corroborating humor as a meaning-making process and distinguishing the mechanism(s) by which it operates. Further, clinical research investigating humor as a meaning-making process may help protect people against meaning threats and therefore improve mental and physical health.

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List of Appendices

Appendix A

Attention Check 1

Directions: Think of the times that you feel distressed or upset. Nevermind, this is an attention check. If you are paying attention, respond by clicking "Agree" for each question.

1. I like people.

2. People are important to me.

3. People are dispensable.

Note: In this attention check, participants could not progress until they answered all 3 questions with the correct response item. Attention checks 1 and 2 were structured according to the recommendation of Oppenheimer et al., 2009 in an effort to increase statistical power.

Appendix B

Attention Check 2

Below you will find various statements. Most likely, you will strongly agree with some statements and strongly disagree with others. Sometimes you may feel more neutral. Nevermind, the purpose of this question is to see if you are paying attention to instructions. Please respond to each of the following statements by selecting strongly agree from the dropdown menu. When you are done, each response should say strongly agree.

1. I feel that most people like their jobs.

2. I think that people should like working hard.

3. It bothers me when people don't work hard.

4. I work as hard as other people.

5. I do not think that everyone should like their job.

Note: In this attention check, participants could progress regardless of their answer to the above questions. Responses containing incorrect responses were subsequently excluded from analyses. Attention checks 1 and 2 were structured according to the recommendation of Oppenheimer et al., 2009 in an effort to increase statistical power.

Expected Biggles

In 1974, the Monty Python comedy group published a book called "The Brand New Monty Python Papperbok." In the book there is a story called "Biggles: Pioneer Air Fighter." This story is an absurd parody of combat adventure stories, and is meant to be a joke.

Squadron-Leader Bigglesworth walked purposefully across the tarmac. It was a cold, grey November morning and a mist was drifting across the desolate airfield. Biggles clambered onto the wing of the waiting Jupiter and lowered himself into the cockpit. "Weather looks dicey," observed Ginger dryly. "The sooner we take off the better," murmured Algy, "I'd rather see this thick fog from topside." "Shut up, the pair of you," snapped Biggles, "and hand me a cigarette." "Oh, you're not going to smoke, are you Biggles?" queried Algy. "It's such an awful smell," added Ginger ruefully. Lighting up briskly, Biggles slammed the Jupiter into full throttle and taxied into the drifting mist. Suddenly he was airborne. Algy breathed a sigh of relief and eased himself out of the co-pilot's seat. "Oh, it's so hot in here," Algy declared evenly. He began to unzip his flying jacket and soon stood naked in the faint glow of the altimeter. Ginger blushed hotly. Algy returned his blush curtly. Biggles also turned red and threw the twin engine Jupiter into a tight turn over the airfield. "Does my body offend you, Biggles?" queried Algy sharply. Biggles said nothing. His drug-ravaged features showed no glimmer of emotion. His lips were set, his dilated pupils looked neither to right nor left and his hands gripped the stiff joystick. Suddenly out of the clouds directly ahead of them Ginger glimpsed the red flash of the German fighter. "Look, it's the Red Baron!" he cried excitedly. "Get off my lap, Algy," murmured Biggles curtly. "Shan't," returned Algy, teasingly. "He's flying at us out of the sun!" yelled Ginger anxiously. "Put your bloody trousers on, Ginger," ordered Biggles grimly. But it was too late.

Von Richthofen flew nearer and nearer. Soon he appeared in the cockpit. "My God, we're done for!" screamed Ginger. "Aha! All ready are we?" shouted von Richthofen, tearing off his own flying suit. "May I steer your joystick for a while, Biggles?" asked Richthofen forcefully. Biggles said nothing, but allowed the Red Baron to handle his controls. By this time, Ginger was also naked as he guided his joystick. Soon the little Jupiter monoplane powered by two 770 h.p. Cyclone engines was rocking from side to side as the dastardly German had his way with the naked, drug crazed British lads. (from Proulx et al., 2010).

Appendix D

Unexpected Biggles

Major James Bigglesworth, better known in flying circles as "Biggles", is a fictional pilot and adventurer created by W. E. Johns. He first appeared in the story "The White Fokker", published in the first issue of Popular Flying magazine. The first collection of Biggles stories, The Camels are Coming, was published in 1932. In his first appearance, Biggles was a fighter pilot in the Royal Flying Corps (RFC) during World War I. He joined the RFC in 1916 at the young age of 17, having conveniently "lost" his birth certificate. The original Biggles stories were based on Johns' experience — and stories he had heard from other pilots — during his time in France. Biggles was supposedly based on Cyril Lowe. While the purpose of the Biggles stories was to entertain young men, they paid attention to historical detail and helped recreate the primitive days of early air combat. Biggles has a small team of friends including Algy (Algernon Lacey), Ginger (Hebblethwaite) and Bertie (Lord Bertie Lissie), who share many of his adventures as pilots in the Special Air Police. Biggles' greatest opponent is the German pilot Baron Von Richthofen. Squadron-Leader Bigglesworth walked purposefully across the tarmac. It was a cold, grey November morning and a mist was drifting across the desolate airfield. Biggles clambered onto the wing of the waiting Jupiter and lowered himself into the cockpit. "Weather looks dicey," observed Ginger dryly. "The sooner we take off the better," murmured Algy, "I'd rather see this thick fog from topside." "Shut up, the pair of you," snapped Biggles, "and hand me a cigarette." "Oh, you're not going to smoke, are you Biggles?" queried Algy. "It's such an awful smell," added Ginger ruefully. Lighting up briskly, Biggles slammed the Jupiter into full throttle and taxied into the drifting mist. Suddenly he was airborne. Algy breathed a sigh of relief and eased himself out of the co-pilot's seat. "Oh, it's so hot in here," Algy declared evenly. He began to

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naked, drug crazed British lads. (from Proulx et al., 2010).

Mortality Expected Biggles

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Mortality Unexpected Biggles

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Von Richthofen flew nearer and nearer. Soon he appeared in the cockpit. "My God, we're done

for!" screamed Ginger. "Aha! All ready are we?" shouted von Richthofen, tearing off his own

flying suit. "May I steer your joystick for a while, Biggles?" asked Richthofen forcefully.

Biggles said nothing, but allowed the Red Baron to handle his controls. By this time, Ginger was

also naked as he guided his joystick. Soon the little Jupiter monoplane powered by two 770 h.p.

Cyclone engines was rocking from side to side as the dastardly German had his way with the

naked, drug crazed British lads. Suddenly, the plane fell out of the sky and exploded as it hit the

ground. Everyone died, and so will you.

Appendix G

Mortality Salience

In 1886, the Russian author Leo Tolstoy published the Death of Ivan Ilyich, a story about death.

This is an excerpt from the book, which describes the moment the main character dies.

For three whole days, during which time did not exist for him, he struggled in that black sack into which he was being thrust by an invisible, resistless force. He struggled as a man condemned to death struggles in the hands of the executioner, knowing that he cannot save himself. And every moment he felt that despite all his efforts he was drawing nearer and nearer to what terrified him. He felt that his agony was due to his being thrust into that black hole and still more to his not being able to get right into it. He was hindered from getting into it by his conviction that his life had been a good one. That very justification of his life held him fast and prevented his moving forward, and it caused him most torment of all. Suddenly some force struck him in the chest and side, making it still harder to breathe, and he fell through the hole and there at the bottom was a light. What had happened to him was like the sensation one sometimes experiences in a railway carriage when one thinks one is going backwards while one is really going forwards and suddenly becomes aware of the real direction. "Yes, it was not the right thing," he said to himself, "but that's no matter. It can be done. But what is the right thing? he asked himself, and suddenly grew quiet. This occurred at the end of the third day, two hours before his death. Just then his schoolboy son had crept softly in and gone up to the bedside. The dying man was still screaming desperately and waving his arms. His hand fell on the boy's head, and the boy caught it, pressed it to his lips, and began to cry. At that very moment Ivan Ilyich fell through and caught sight of the light, and it was revealed to him that though his life had not been what it should have been, this could still be rectified. He asked himself, "What is the right

thing?" and grew still, listening. Then he felt that someone was kissing his hand. He opened his eyes, looked at his son, and felt sorry for him. His wife came up to him and he glanced at her. She was gazing at him open-mouthed, with undried tears on her nose and cheek and a despairing look on her face. He felt sorry for her too. "Yes, I am making them wretched," he thought. "They are sorry, but it will be better for them when I die." He wished to say this but had not the strength to utter it. "Besides, why speak? I must act," he thought. With a look at his wife he indicated his son and said: "Take him away . . .sorry for him . . . sorry for you too. . . ." He tried to add, "Forgive me," but said "Forego" and waved his hand, knowing that He whose understanding mattered would understand. And suddenly it grew clear to him that what had been oppressing him and would not leave him was all dropping away at once from two sides, from ten sides, and from all sides. He was sorry for them, he must act so as not to hurt them: release them and free himself from these sufferings. "How good and how simple!" he thought. "And the pain?" he asked himself. "What has become of it? Where are you, pain?" He turned his attention to it. "Yes, here it is. Well, what of it? Let the pain be." "And death . . . where is it?" He sought his former accustomed fear of death and did not find it. "Where is it? What death?" There was no fear because there was no death. In place of death there was light. "So that's what it is!" he suddenly exclaimed aloud. "What joy!" To him all this happened in a single instant, and the meaning of that instant did not change. For those present his agony continued for another two hours. Something rattled in his throat, his emaciated body twitched, then the gasping and rattle became less and less frequent. "It is finished!" said someone near him. He heard these words and repeated them in his soul. "Death is finished," he said to himself. "It is no more!" He drew in a breath, stopped in the midst of a sigh, stretched out, and died. (from Tolstoy, 1886/1973)

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Appendix H

Zoo

One day an out of work mime is visiting the zoo and attempts to earn some money as a street performer. As soon as he starts to draw a crowd, a zoo keeper grabs him and drags him into his office. The zoo keeper explains to the mime that the zoo's most popular attraction, a gorilla, has died suddenly and the keeper fears that attendance at the zoo will fall off. He offers the mime a job to dress up as the gorilla until they can get another one. The mime accepts. So the next morning the mime puts on the gorilla suit and enters the cage before the crowd arrives. He discovers that it's a great job. He can sleep all he wants, play and make fun of people and he draws bigger crowds than he ever did as a mime. However, eventually the crowds tire of him and he tires of just swinging on tires. He begins to notice that the people are paying more attention to the lion in the cage next to his. Not wanting to lose the attention of his audience, he climbs to the top of his cage, crawls across a partition, and dangles from the top to the lion's cage. Of course, this makes the lion furious, but the crowd loves it. At the end of the day the zoo keeper comes and gives the mime a raise for being such a good attraction. Well, this goes on for some time, the mime keeps taunting the lion, the crowds grow larger, and his salary keeps going up. Then one terrible day when he is dangling over the furious lion he slips and falls. The mime is terrified. The lion gathers itself and prepares to pounce. The mime is so scared that he begins to run round and round the cage with the lion close behind. Finally, the mime starts screaming and yelling, "Help! Help me!", but the lion is quick and pounces. The mime soon finds himself flat on his back looking up at the angry lion and the lion says, "Shut up or you'll get us both fired!" (from Proulx et al., 2010).

Self-Importance of Moral Identity Scale (Aquino & Reed, 2002)

Listed below are some characteristics that might describe a person. Please select from the dropdown menu the extent to which you agree or disagree with each question.

Caring, Compassionate, Fair, Friendly, Generous, Helpful, Hardworking, Honest, and Kind

	Strongly Disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)
It would make me feel good to be a person who has these characteristics. (1)	o	o	o	o	o
Being someone who has these characteristics is an important part of who I am. (2)	o	o	o	o	o
I often wear clothes that identify me as having these characteristics. (3)	o	o	o	o	o
I would be ashamed to be someone who has these characteristics. (4)	o	o	o	o	o

The types of things I do in my spare time (e.g., hobbies) clearly identify me as having these characteristics. (5)	o	o	o	o	o
The kinds of books and magazines I read identify me as having these characteristics. (6)	o	o	o	o	o
Having these characteristics is not really important to me. (7)*	o	o	o	o	o
The fact that I have these characteristics is communicated to others by my membership in certain organizations. (8)	o	o	o	o	o
I am actively involved in activities that communicate to others that I have these characteristics. (9)	o	o	o	o	o

I strongly desire to have these characteristics. (10)	o	o	o	o	o

*Indicates the item is reverse-coded.

Appendix J

General Belongingness Scale (Malone et al., 2011)

Please select from the dropdown menu the extent to which you agree or disagree with each question.

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree or Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
When I am with other people, I feel included. (1)	o	o	o	o	o	o	o
I have close bonds with family and friends. (2)	o	o	o	o	o	o	o
I feel like an outsider. (3)	o	o	o	o	o	o	o
I feel as if people do not care about me. (4)	o	o	o	o	o	o	o
I feel accepted by others. (5)	o	o	o	o	o	o	o
Because I do not belong, I feel distant during the holiday season. (6)	o	o	o	o	o	o	o

I feel isolated from the rest of the world. (7)	o	o	o	o	o	o	o
I have a sense of belonging. (8)	o	o	o	o	o	o	o
When I am with other people, I feel like a stranger. (9)	o	o	o	o	o	o	o
I have a place at the table with others. (10)	o	o	o	o	o	o	o
I feel connected with others. (11)	o	o	o	o	o	o	o
Friends and family do not involve me in their plans. (12)	o	o	o	o	o	o	o

Appendix K

Distress Tolerance Scale (Simons & Gaher, 2005)

Directions: Think of the times that you feel distressed or upset. Select the drop down menu the item that most closely aligns with your beliefs.

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
Feeling distressed or upset is unbearable to me. (1)	o	o	o	o	o
When I feel distressed or upset, all I can think about is how bad I feel. (2)	o	o	o	o	o
I can't handle feeling distressed or upset. (3)	o	o	o	o	o
My feelings of distress are so intense that they completely take over. (4)	o	o	o	o	o
There's nothing worse than feeling distressed or upset. (5)	o	o	o	o	o
I can tolerate being distressed or upset as well as most people. (6)	o	o	o	o	o

My feelings of distress or being upset are unacceptable. (7)	o	o	o	o	o
I'll do anything to avoid feeling distressed or upset. (8)	o	o	o	o	o
Other people seem to be able to tolerate feeling distressed or upset better than I can. (9)	o	o	o	o	o
Being distressed or upset is always a major ordeal for me. (10)	o	o	o	o	o
I am ashamed of myself when I feel distressed or upset. (11)	o	o	o	o	o
My feelings of distress or being upset scare me. (12)	o	o	o	o	o

Appendix L

General Belief in a Just World Scale (Lipkus, 1999)

Below you will find various statements. Most likely, you will strongly agree with some statements and strongly disagree with others. Sometimes you may feel more neutral. Read each statement carefully and decide to what extent you personally agree or disagree with it.

	Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Slightly Agree (4)	Agree (5)	Strongly Agree (6)
I feel that people get what they are entitled to have. (1)	o	o	o	o	o	o
I feel that a person's efforts are noticed and rewarded. (2)	o	o	o	o	o	o
I feel that people earn the rewards and punishments they get. (3)	o	o	o	o	o	o
I feel that people who meet with misfortune have brought it on themselves. (4)	o	o	o	o	o	o
I feel that people get what they deserve. (5)	o	o	o	o	o	o

I feel that rewards and punishments are fairly given. (6)	o	o	o	o	o	o
I basically feel that the world is a fair place. (7)	o	o	o	o	o	o

Appendix M

Meaning in Life Questionnaire (Steger et al., 2006)

Please take a moment to think about what makes your life and existence feel important and significant to you. Please respond to the following statements as truthfully and accurately as you can, and also please remember that these are very subjective questions and that there are no right or wrong answers.

	Absolutely untrue (1)	Mostly untrue (2)	Somewhat untrue (3)	Can't say true or false (4)	Somewhat true (5)	Mostly true (6)	Absolutely true (7)
I understand my life's meaning. (1)	o	o	o	o	o	o	o
I am looking for something that makes my life feel meaningful. (2)	o	o	o	o	o	o	o
I am always looking to find my life's purpose. (3)	o	o	o	o	o	o	o
My life has a clear sense of purpose. (4)	o	o	o	o	o	o	o

I have a good sense of what makes my life meaningful. (5)	o	o	o	o	o	o	o
I have discovered a satisfying life purpose. (6)	o	o	o	o	o	o	o
I am always searching for something that makes my life feel significant. (7)	o	o	o	o	o	o	o
I am seeking a purpose or mission for my life. (8)	o	o	o	o	o	o	o
My life has no clear purpose. (9)*	o	o	o	o	o	o	o
I am searching for meaning in my life. (10)	o	o	o	o	o	o	o

* indicates the item is reverse-coded.

Tables 1a-1f.

Participant Demographics Following Data Cleaning (*N* = 308).

Table 1a. Education Level.

Education Level	*n*	Proportion of Sample
Bachelor's degree	193	62.7%
Master's degree	62	20.1%
Associate's degree	17	5.5%
Some college but no degree	17	5.5%
High School graduate or equivalent	15	4.9%
Professional degree (JD, MD)	3	1%
Doctoral Degree	1	0.3%

Table 1b. Sexual Orientation.

Sexual Orientation	*n*	Proportion of Sample
Heterosexual	230	74.7%
Bisexual	67	21.8%
Homosexual	7	2.3%
Prefer not to say	3	1%
Other	1	0.3%

Table 1c. Race/Ethnicity.

Race/Ethnicity	*n*	Proportion of Sample
White	189	61.4%
Asian	89	28.9%
Black	27	8.8%
LatinX	4	1.3%
Other ("Multiracial, "mixed", "Hispanic")	3	0.9%
Native American or Alaska Native	1	0.3%

Table 1d. Marital Status.

Marital Status	*n*	Proportion of Sample
Married	220	71.4%
Never Married	78	25.3%
Divorced	8	2.6%
Separated	1	0.3%
Widowed	1	0.3%

Table 1e. Age.

Mean Age	Median Age	Minimum Age	Maximum Age
35.89	33	18	78

Table 1f. Biological Sex.

Biological Sex	*n*	Proportion of Sample
Male	187	60.7%
Female	121	39.3%

Table 2.

Number of Participants per Condition

	n	Proportion of sample
Expected Biggles	49	15.9
Unexpected Biggles	63	20.5
Expected Mortality Biggles	47	15.3
Mortality Unexpected Biggles	48	15.6
Tolstoy	52	16.9
Zoo	49	15.9
Total	308	100

Table 3.

Levene's Test of Equality of Error Variances

	Levene Statistic	*df* 1	*df* 2	*p*
Global Belief in a Just World	.91	5	302	.48
Self-Importance of Moral Identity	2.01	5	302	.08
General Belongingness	2.60	5	302	.03*
Meaning in Life	1.10	5	302	.36

Note. Levene statistic based on mean scores. This tests the hypothesis that the error variance of each dependent variable is equal across groups. * denotes significance at the .05 level.

Table 4.

One-Way Analysis of Variance of Funniness Rating Across Reading Conditions

Source	df	SS	MS	F	p
Between groups	5	199.22	39.84	8.14	<.001*
Within groups	302	1478.24	4.90		
Total	307	1677.46			

Multiple Comparisons

	Expected Biggles	Unexpected Biggles	Expected Mortality Biggles	Unexpected Mortality Biggles	Tolstoy	Zoo
Expected Biggles	1	.66	-.05	.20	1.70*	-.95
Unexpected Biggles		1	-.71	-.46	1.04	-1.62*
Expected Mortality Biggles			1	.26	1.76*	-.91
Unexpected Mortality Biggles				1	1.50*	-1.16
Tolstoy					1	-2.67*
Zoo						1

Note. Post-hoc comparisons using Tukey's HSD. Mean differences shown. * denotes significance at the .05 level

Table 5.

Multivariate Analysis of Variance for Mean Differences of Belief Across Reading Conditions

Test Statistic	Test Statistic Value	F	Hypothesis df	Error df	p	partial η^2
Pillai's Trace	.05	.81	20	1208	.70	.01
Wilk's Lambda	.95	.81	20	992.62	.71	.01
Hotelling's Trace	.05	.80	20	1190	.71	.01
Roy's Largest Root	.03	1.56	5	302	.17	.03

Table 6.

F-Tests for Global Belongingness

	SD	Variance	*df*	Comparison	*F*	*p*
Expected Biggles (EB)	9.48	89.78	48	T/Zoo	1.26	0.21
Unexpected Biggles (UB)	9.40	88.19	62	MUB/Zoo	1.21	0.26
Mortality Expected Biggles (MEB)	10.77	116.09	46	Zoo/MEB	1.04	0.45
Mortality Unexpected Biggles (MUB)	12.07	145.78	47	Zoo/UB	1.37	0.12
Tolstoy (T)	12.34	152.18	51	Zoo/EB	1.34	0.16
Zoo	10.98	120.47	48			

Note. *p*-values calculated using: https://www.socscistatistics.com/pvalues/fdistribution.aspx.

CURRICULUM VITAE
Joshua Semko

Clinical Psychology Doctoral Program
University of Mississippi
Department of Psychology
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Last updated: April 2022

EDUCATION

2019 – Present   **Doctor of Philosophy, Psychology (anticipated May 2025)**
                   Emphasis: Clinical Psychology
                   Minor: Applied Statistics
                   Master of Arts, Psychology (anticipated May 2022)
                   Emphasis: Clinical Psychology
                   University of Mississippi, University, MS
                   Major Advisor: Stefan E. Schulenberg, Ph.D.

2015 – 2019   **Bachelor of Science, Psychology**
                   Bachelor of Arts, Philosophy
                   Boise State University, Boise, ID
                   Magna Cum Laude (GPA: 3.9)

PEER-REVIEWED PUBLICATIONS AND BOOK CHAPTERS
*Denotes undergraduate research mentee

Semko, J.H., Ghriwati, N.A., Crabtree, V.M., Winter, M., & Merchant, T.E. Sleep Challenges and the Impact of Sleep on Family Functioning in Children and Adolescents with Craniopharyngioma. *Manuscript in preparation.*

Ghriwati, N.A., Crabtree, V.M., Winter, M., Merchant, T.E., **Semko, J.H.** The Feasibility and Acceptability of Ecological Momentary Assessment to Evaluate Sleep, Family Functioning, and Mood in Pediatric Craniopharyngioma. *Manuscript in preparation.*

Raley, M., **Semko, J.H.,** Schulenberg, S.E., & Lange, L.J. Does Social Connectedness Mediate the Association of Meaning in Life with Depression Symptoms, Anxiety Symptoms, Stress, and Post-traumatic Stress Symptoms? A Brief Report on College Students Following the 2018 Jacksonville. Landing Shooting. *Manuscript in preparation.*

Semko, J.H., Lucas, K., *Fortner, S.R.M., & Schulenberg, SE. Meaning In The Context of COVID-19: Coherence, Significance, and Purpose in Light of a Pandemic. *Book chapter in preparation.*

Semko, J.H., Raley, M., & Schulenberg, SE. The 2010 Haiti Earthquake. *Book chapter in preparation.*

Raley, M., **Semko, J.H.,** and Schulenberg, SE. The 2020 Australian Bushfires. *Book chapter in preparation.*

PEER-REVIEWED POSTER AND ORAL PRESENTATIONS
*Denotes undergraduate research mentee

Kamara, D., Crabtree, V., Crowley, S., **Semko, J.H.,** Merchant, T.E., Mandrell, B. (2022) *Circadian rhythms among youth with craniopharyngioma.* Poster to be presented at SLEEP in June 2022.

MacArthur, E., **Semko, J.H.**, Kamara, D. Wang, F., Pan, H., Brigden, J., Pappo, A., Wilson, M., & Crabtree, V. (2022). *Increased adherence to light therapy and psychosocial outcomes in adolescents and young adults with cancer.* Poster to be presented at SLEEP in June 2022.

*Gaar, A.V., *Cordell, C.E., **Semko, J.H.**, & Schulenberg, S.E. (2022). *Examining Political Ideology As a Possible Correlate of Cooperation in an Iterated Prisoner's Dilemma*. Poster to be presented at the 7th Annual UM Conference on Psychological Sciences in April, 2022.

*Fortner, S.R.M., **Semko, J.H.**, & Schulenberg, S.E. (2022). *Increasing Cooperation? Search for Meaning as a Predictor of Cooperation in an Iterated Prisoner's Dilemma Game.* Poster to be presented at the 7th Annual UM Conference on Psychological Sciences in April, 2022.

Semko, J.H. (2022). *How the Search for Meaning and Mortality Salience Affects Strategy in an Iterated Prisoner's Dilemma.* Oral presentation given at the UM Graduate Student Council Research and Creative Achievement Symposium on March 8th, 2022.

Semko, J.H. (2021). *How Thinking About Death Affects Cooperation in the Prisoner's Dilemma.* Oral presentation given at the University of Mississippi Three-Minute Thesis Competition in University, Mississippi on October 28th, 2021.

Semko, J.H., Schulenberg, S.E. (2021). *The Effects of Mortality Salience and Absurd Humor on Moral Identity, Belief in a Just World, Belongingness, and Meaning in Life.* Poster presentation given via Zoom at the 72nd Mississippi Psychological Association Annual Conference on September 30th, 2021.

Semko, J.H. (2020/2021). *The Ultimate Solution to the Von Neumann Problem*. Paper accepted for oral presentation at the Midsouth Philosophy Conference at Rhodes College in Memphis, Tennessee in March 2020 and March 2021. Both conferences were cancelled due to COVID-19.

Semko, J.H., Maack, D.J. (2019). *Ted Bundy and the Three Domains of Disgust.* Oral presentation given at the University of Mississippi Three-Minute Thesis Competition in University, Mississippi.

Semko, J.H. (April, 2019). *In Defense of Terence Parsons' Theory of Non-Existent Objects.* Paper presented at the 23rd annual Pacific University Undergraduate Philosophy Conference in Forest Grove, Oregon.

Semko, J.H. (January, 2019). *How Humor Changes Your Mind: Why Bad Jokes Increase Your Perception of Risk.* Oral presentation given at the 7th Annual Southeastern Idaho Psi Chi Psychology Conference at Idaho State University in Pocatello, Idaho.

Semko, J.H., Stone, B.W. (July, 2018). *Creating Visual Experience In The Absence Of Sensory Stimulation.* Poster presented at the Idaho Conference On Undergraduate Research in Boise, Idaho.

Semko, J.H., Stone, B.W. (April, 2018). *Seeing Is What You Hear: Inducing Visual Hallucinations via Pavlovian Conditioning.* Poster presented at the Rocky Mountain Psychological Association Conference in Denver, Colorado.

Semko, J.H. (April, 2018). *The Predictive Brain: Implications for Evidentialist Mentalism and Reliabilism.* Paper presented Pacific University's 22nd Annual Undergraduate Philosophy Conference in Forest Grove, Oregon.

Semko, J.H. (April, 2018). *Hijacking The Predictive Brain.* Podium presentation given at Boise State University Undergraduate Research Conference in Boise, Idaho.

INVITED TALKS

System-Level Intervention: Using Quality Improvement Methods to Improve Sleep in the PICU
Oral presentation to be given at St. Jude Children's Research Hospital in May, 2022.

The World and Me: Supporting Neurodiverse College Students
Oral presentation to be given at the University of Mississippi on April 15, 2022 via Zoom.

On Being a Person in a Clinical Psychology Doctoral Program
Oral presentation given at the Mississippi University for Women on March 4th, 2021 via Zoom.

EDITORIAL/REVIEW ACTIVITIES

Sleep Medicine Reviews (Mentored Ad-Hoc Review)
Journal of Child and Adolescent Psychiatric Nursing (Mentored Ad-Hoc Review)
Journal of Pediatric Psychology (Mentored Ad-Hoc Review)
Journal of Neuro-Oncology (Mentored Ad-Hoc Review)
Cell Cycle (Mentored Ad-Hoc Review)
Sleep (Multiple Mentored Ad-Hoc Reviews)
Journal of Developmental and Behavioral Pediatrics (Mentored Ad-Hoc Review)
Journal of Contextual Behavioral Science (Mentored Ad-Hoc Review)

RESEARCH EXPERIENCE

Graduate Researcher
St. Jude Children's Research Hospital, Memphis, TN   Summer 2021 – Present
Supervisor: Valerie Crabtree, Ph.D.
- Investigating sleep disruptions in children with cancer.

Graduate Researcher
CDRC, University of Mississippi, University, MS   Summer 2021 – Present
Supervisor: Stefan E. Schulenberg, Ph.D
- Investigating the role of emotions in interactive strategic decision making
- Investigating meaning, clinical disaster mental health, and emergency management.

Master's Thesis
Investigating the Effects of Absurd Humor and Mortality Salience On Moral Identity, Belongingness, Belief In A Just World, and Meaning in Life
CDRC, University of Mississippi, University, MS   Spring 2019 – Spring 2022
Supervisor: Stefan E. Schulenberg, Ph.D.

- Investigating the role of humor and mortality salience in meaning making.

Graduate Researcher
ADEPT Lab, University of Mississippi, University, MS   Fall – Spring 2019
Supervisor: Danielle Maack, Ph.D.
- Completed a literature review on evolutionary models of disgust and psychopathy.
- Investigated the relationship between primary/secondary psychopathy and moral/sexual/pathogen disgust.
- Recruited pregnant women at a large OBGYN clinic for a research study examining levels of depression, anxiety, disgust, emetophobia, and disturbed sleep across pregnancy and postpartum. Administered self-report measures and providing mental health feedback to physicians.
- Administered self-report measures and ran participants through several behavioral activation tasks for a research study examining the relationship between emetophobia and other kinds of psychopathology.

Senior Research Project
Divergent Effects of Mirth On Risk Perception
Boise State University, Boise, ID.   2018 – 2019
Supervisor: Cindy McCrea, Ph.D., Stephen Crowley, Ph.D.
- Designed an experiment aiming to garner support for a computational model of humor.
- Conducted literature reviews, designed experiments, built surveys, submitted IRB applications, performed statistical analyses, and presented research under the direction of my supervisors.

Independent Undergraduate Research
Seeing Is What You Hear: Inducing Visual Hallucinations via Pavlovian Conditioning
Department of Psychological Science
Boise State University   2017 – 2018
Supervisor: Brian Stone, Ph.D.
- Co-designed an experiment aiming to induce visual hallucinations over the internet by overriding bayesian predictive mechanisms of the brain via pavlovian conditioning.
- Conducted literature reviews, helped design software, submitted IRB applications, ran research participants in the lab, performed statistical analysis, and presented research under the direction of Dr. Stone.

Research Assistant
Seeing Her Race: How Hair Texture Affects Social Evaluation
Department of Psychology, Northwestern University   Fall 2018
Faculty Advisor: Janene Cielto, M.Sc.
- Created code and coded video for Janene Cielto's dissertation at Northwestern University.

Research Assistant

The Impact of Prenatal Methamphetamine Exposure on Verbal Memory

Northwest Neurobehavioral Health, Meridian, ID   2017 – 2018

Faculty Advisor: Carolyn Golden, Psy.D.

- Transferred data from comprehensive diagnostic assessment and neuropsychological assessment reports into a database on SPSS.
- Maintained a database and helped train research assistants.

CLINICAL EXPERIENCE

Children's Social Skills Group (Founder and Leader)

University of Mississippi, University, MS   2021 – Present

Supervisor: Kristin Austin Ph.D.

- Building and leading a social skills group for children with ASD.
- Recruiting and coordinating doctoral-level graduate students to help facilitate the group and collect outcome data.

Behavior Specialist

Behavior Consultants, PLLC   2020 – Present

Supervisor: Alan Gross, Ph.D.

- Consulting preschool teachers and providing evidence-based behavioral strategies to enhance classroom management in rural Mississippi.
- Creating behavior plans for toddlers and preschool-aged children.

Graduate Clinician

University of Mississippi, University, MS   2019 – Present

Supervisor: John Young, Ph.D.

- Attending weekly supervision meetings.
- Administering evidence-based treatments to patients at the Psychological Services Center.
- Participating in didactics related to evidence-based clinical interventions.

Graduate Clinician

The Baddour Center   2020 – 2021

Supervisor: Joshua Fulwiler, Ph.D.

- Attended weekly supervision meetings.
- Administered evidence-based interventions to geriatric and adult-aged persons with intellectual disabilities and various comorbid psychiatric disorders.
- Created behavior plans for geriatric and adult-aged persons with intellectual disabilities.
- Participated in didactics related to evidence-based clinical interventions.
- Facilitated group therapy sessions for social skills.

Undergraduate Intern

Northwest Neurobehavioral Health, Meridian, ID   2017 – 2018
Supervisor: Carolyn Golden, Psy.D.
- Scored neuropsychological tests and helped develop assessment reports.
- Trained new interns.

Undergraduate Intern
Idaho Department of Health and Welfare, Region IV Adult Behavioral Health   Summer 2017
Boise, ID.
Supervisor: Teresa Shackelford, LCSW
- Observed the psychological evaluation and counseling of individuals in Ada County Jail and various inpatient mental health facilities, as well as "walk-ins" in the adult behavioral health section of IDHW.
- Rode along with the Crisis Intervention Unit.

TEACHING EXPERIENCE

Teaching Assistant: 高级临床与咨询心理学议题 (Advanced Topics in Clinical and Counseling Psychology)
The Chinese University of Hong Kong - Shenzhen, China   Fall 2022
- Assisting Dr. Jim Cartreine teach an evidence-based psychotherapy course for masters-level graduate students in mainland China via Zoom.
- Responsible for teaching CBT skills and lecturing about behavioral activation for depression.

Statistics Tutor
University of Mississippi, University, MS   Summer 2021 – Present
- Tutoring for undergraduate statistics courses.

Guest Lecturer: Theories of Personality
University of Mississippi, University, MS   Fall 2019
- Lectured on Abraham Maslow's theory of personality.

Guest Lecturer: Introduction to Psychology
University of Mississippi, University, MS   Fall 2019
- Lectured on Pseudoscience vs. Science.

Learning Assistant: Introduction To Philosophy: Contemporary Issues
Boise State University, Boise, ID   2018 – 2019
- Hired by the philosophy department at Boise State University to grade papers, create assignments, and hold tutoring sessions for an introduction to philosophy class.

Philosophy Tutor
Boise State University, Boise, ID   2018 – 2019

- Hired by the philosophy department at Boise State University to help undergraduate students prepare for exams and write papers.

Teaching Assistant: Introduction to Psychology
Boise State University, Boise, ID   2017 – 2018
- Created multiple choice questions for exams and quizzes, created assignments, held office hours, and tutored students.
- Graded homework assignments and essays.

MENTORSHIP EXPERIENCE

Peer Mentor
University of Mississippi, University, MS   2021 – Present
- Mentoring a doctoral student through the psychology department's peer mentorship program.

Project Lead and Research Mentor
University of Mississippi, University, MS   2021 – Present
- Hiring, managing, and mentoring three undergraduate research assistants on a research project funded by a grant from the Graduate Student Council.

SERVICE

Friends of Baddour
The Baddour Center   Anticipated Summer 2022
Supervisor: Deb Mcnamee, LBCBA
- Created a community service organization aiming to foster social connectedness for adults with intellectual disabilities.
- Recruiting and coordinating a volunteer force composed of doctoral-level psychology students from the University of Mississippi.

LAMBDA
University of Mississippi, University, MS   2020 – Present
Supervisor: Kristin Austin, Ph.D.
- Facilitating and co-leading a support group for individuals in the LGBTQIA+ community at the University of Mississippi aimed at fostering belongingness.

Speaker/Panelist
University of Mississippi Psi Chi Chapter and Psychology Club   Fall 2021

- Discussed "life as a graduate student" with undergraduate students.

GRANTS, AWARDS, HONORS, AND ASSOCIATIONS

Small Grant in Behavioral Economics
Russell Sage Foundation - (Not funded)

Graduate Student Council Research Grant
University of Mississippi - $1,000 (Funded)

Critical Thinking Redesign Mini-Grant
University of Mississippi - $500 (Funded)

Associate Member, International Society for Humor Studies

Phi Kappa Phi, National Honor Society
Boise State University

Psi Chi International Honor Society in Psychology
Boise State University

WUE Tuition Scholarship Award
Boise State University

PROFESSIONAL REFERENCES

References available upon request