

Psychological Perceptions of Disaster Misconceptions: Exploring the Acceptance of Disaster
Myths in Relation to Psychological Well-being, Resilience and Conspiracist Ideation

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Abstract

This exploratory study examined psychological wellness and resilience as predictors of conspiracist beliefs, disaster response beliefs, and disaster misconceptions beliefs. Data was collected from 300 participants through Amazon's MTurk who completed a demographic questionnaire; for Misconception Measures the Myth and Misconception Propositions about Disasters Questionnaire (Alexander, 2007), Beliefs about Disaster Response (Wenger et al., 1975), and Generic Conspiracist Beliefs Scale (Brotherton et al., 2013); for Resilience Measures the 10-item Connor-Davidson Resilience Scale (Campbell-Sills & Stein, 2007), Beliefs about Resilient Behaviors subscale from the Behavior in Mass Emergencies Questionnaire (Drury et al., 2013); and for Psychological Wellness the 2-item Perceived Stress Scale (Buchanan & McConnell, 2017), Spiritual Well-Being Scale (Paloutzian & Ellison, 1991), Brief Symptom Inventory 18 (Degrogatis, 2000), and 10-item Personality Inventory (Gosling et al., 2003). The *M_{age}* of participants was 33.6 years (*SD* = 10.0), ranging between 18 and 68 years. Hierarchical regressions revealed that stress, media use, resilience, disaster response beliefs, and disaster misconceptions beliefs contributed significantly to one or more models predicting disaster response beliefs ($R^2 = .64$), disaster misconceptions beliefs ($R^2 = .56$) and conspiracist beliefs ($R^2 = .35$). One implication is that stress could be managed in order to decrease these beliefs.

Psychological Perceptions of Disaster Misconceptions

How does age, a maturation characteristic, impact reactive, proactive, and overall resilience levels? This question is significant because people are affected by their level of resilience every day in big and small ways. This exploratory study hoped to better equip the people who handle trauma on a daily basis with tools that will aid them in handling adversities. A lot of people happen to experience one or more life-threatening or violent moments in their lifespan (Ozer, Best, Lipsey, & Weis, 2003). Being able to categorize patients into age groups and adjust therapy according to what they need would be a meaningful contribution to the study of resilience.

Literature Review Background and Rationale

Various studies have examined the psychology perception of disaster, risk and response behaviors among the public domain (i.e., Gierlacz, Belsher, & Beutler, 2010; Larsson & Enander, 1997; Misanya & Oyhus, 2014; Pennings & Grossman, 2008; Quarantelli, 1989). Research has also demonstrated that misconceptions concerning disaster behavior is widespread, deeply held (Alexander, 2007; Fisher, 2008; Nogami, 2018; Wenger, Dykes, Sebok, & Neff, 1975; Wenger, James, & Faupel, 1985), and may have some influence from popular media culture (Ali, 2013; Mitchell, Thomas, Hill, & Cutter, 2000; Nogami, 2018; Quarantelli, 1985). Furthermore, having preconceived notions about how people will react during disaster events (Mitchell et al., 2000; Wenger et al., 1975) may lead to the development of policies or actions that misallocate vital resources, complicate the response and recovery efforts, undermine resilience behaviors, and threaten the health, safety and psychological well-being of everyone affected by the event (Arnold, 2006; Drury et al., 2013; Nogami, 2018). Unfortunately, there is a dearth of research

that examines specific psychological wellness and resiliency antecedents that may contribute to the misconception of human behaviors during a disaster.

Defining Disaster

Since the beginning of human history, human beings have been impacted by various natural disaster events (e.g. see Kozák & Čermák, 2010, Norris et al., 2002). In 2016 for instance, there were 342 disasters triggered by natural hazards that resulted in 8,733 deaths and an estimated \$154 billion in economic damages (Guha-Sapir et al., 2017). Furthermore, the Centre for Research on the Epidemiology of Disasters (CRED) launched the Emergency Events Database (EM-DAT) for the purposes of fostering humanitarian action at the international and national levels, improving disaster preparedness decision making, and providing a foundation for vulnerability assessment and priority setting (see <https://www.emdat.be/> for further information). The EM-DAT contains data on the occurrence of over 22,000 natural and technological mass disasters that have taken place in the world since 1900.

Despite the advancement in gathering statistical data in relation to disasters, there has been various conceptual definitions of what constitutes a disaster over time (Fischer, 2008; Fritz, 1961; Perry, 2007, 2018, Perry & Quarantelli, 2005; Quarantelli, 1998, 2000) and the lack of standardization of the terminology effect how to analyze the data consistently (Below et al., 2009). For the purposes of this study, a disaster is considered an event or series of events that are: (1) classifiable as natural (i.e., hurricanes, tornadoes, floods, volcanic activity or wild fires) or technological/anthropogenic (i.e., nuclear incidents, transportation accidents, terrorist attacks or hazardous materials incidents); (2) often have a sudden onset; (3) severely disrupt normal social activities; (4) causes implementation of unplanned actions to adjust to the disruption; (5) are concentrated in social time and space; and (6) can cause environmental, physical,

psychological, cultural, social and economic damage to life and property (Nouchi, 2015; Quarantelli, 2000).

Disaster Misconceptions or “Myths”

As stated earlier, disaster events occur regularly; however, despite the growth in research studies that provide evidence regarding human behavior during these events, misconceptions about their social and health consequences remain widespread (Alexander, 2007; Arnold, 2006; de Ville de Goyet, 2000; Drury et al., 2013; Fischer & Drain, 1993; Jacob et al., 2008; Wenger et al., 1975). For instance, Jacob and his colleagues (2008) noted that while there were well-documented cases of rioting and looting in New Orleans after the flooding caused by Hurricane Katrina, there were more reports of prosocial behaviors occurring which is contrary to a common myth that disaster events elicit significant societal breakdown. Unfortunately, adhering to such disaster misconceptions or “myths” can cause major problems regarding the overall emergency response and management process of the event, as well as rouse unnecessarily and unsubstantiated angsts that increase psychological distress (Arnold, 2006; Fischer, 2008; Nogami, 2018).

Numerous studies have identified several disaster misconceptions perceived by people in the United States as being factual and include: the immediate onset of hysterical panic fleeing (“panic flight”) behaviors at the expense of others; increases in civil disorder such as looting; the implementation of Martial Law; increases in post-disaster crime rates; price gauging; mass evacuations as a result of panic flight; surge in states of disaster shock (a state of incapacitating shock) and helplessness; the inevitability of disease epidemics and plagues; mass convergence of people and materials to the disaster site; the over utilization of shelters; news reporting is seen as accurate; the immediate seeking of assistance from relief agencies like the Red Cross by the

survivors; and post (role) abandonment behaviors among emergency responders (Alexander, 2007; Auf der Heide, 2004; Drury et al., 2013; Fischer, 2008; Jacob et al., 2008; Nogami, 2018; Noji, 1997; Trainor & Barsky, 2011; Wenger et al., 1975; Wenger et al., 1985). Among these misconceptions, research has found panic behaviors and civil disorder activities (i.e., looting) tend to be the most commonly endorsed while more resilient behaviors occur instead of helplessness (Alexander, 2007; Drury et al., 2013; Fischer, 2008; Nogami, 2018).

Psychological Constructs that Reinforce Disaster Misconceptions

The logical question that arises at this point centers on what psychological constructs contribute to the development of disaster misconceptions? Additionally, are there more specific psychological well-being components that contribute to such misperceptions? The recent research of Nogami (2018) posits viable theoretical justification that address these questions. According to Nogami (2018), the development of disaster myths can be explained through three psychological paradigms. First, humans have the propensity to focus more on negative events and ignore positive ones (Baumeister et al., 2001). According to this paradigm, as we learn of the impact of a disaster event on the affected population, our perceptions and corresponding reactions tend to exacerbate the outcome of the event (i.e., over exaggerating media reports of survivors engaging in panic flight behaviors, looting and other civil disorder conduct, the over use of emergency shelters, and/or survivors exhibiting overwhelming psychological distress) even though this may not necessarily be the case (Nogami, 2018). Furthermore, based on Baumeister and colleagues (2001) review of numerous studies, this paradigm of “bad is stronger than good” is evident in every area of life. Therefore, Baumeister’s paradigm may suggest that belief in disaster misconceptions can be a product of psychological distress, stress, poor spiritual

well-being, low levels of resilience, undesirable personality traits, and/or the adaptation of pessimistic ideation (e.g., belief in stereotypes and conspiracist ideation).

The next paradigm, the availability heuristic (Tversky & Kahneman, 1973) hypothesizes that people are inclined to evaluate the frequency of an event based on its similarity to previous events that come to mind. In this regard, it may be our natural tendency to view post-disaster behaviors, such as panic flight and civil disorder, as normal reactions to the disaster event instead of considering other plausible explanations (i.e., media dramatization) that elicit such misperceptions (Nogami, 2018). Therefore, it may be safe to assume that other factors, such as one's psychological well-being states and one's ability to adapt to change, may be considered as other plausible reasons that contribute to the acceptance of disaster myths but are ignored under this paradigm.

The final psychological paradigm posited by Nogami (2018) is the correspondence bias (Gilbert & Malone, 1995). According to this paradigm, humans tend to draw inferences about an individual's dispositional factors based on behaviors that can be solely explained by the situation in which they occur. This can lead to the development of incorrect assumptions about a person's behavior during a disaster event. For instance, Nogami (2018) cited the 2015 earthquake in Nepal, in which panic flight was used to describe disaster victims' running away behaviors by the mass media instead of it being reported as logical in order for them to avoid being injured by collapsing buildings. Nogami (2018) noted that the correspondence bias is common among the media, emergency response professionals and disaster survivors despite no corroborating evidence to support such disaster misconceptions. Unfortunately, a negative consequence of the correspondence bias includes a self-induced constraint in which people will look for situations that drive them in the same direction as do their own dispositions (Gilbert & Malone, 1995).

Hence, a person's psychological well-being states, resilience capacity and degree of belief in conspiracist ideation may lead to the acceptance of disaster misperceptions.

Psychological Wellness

Psychological wellness has been proposed to be an “anchored point at the positive end of an adjustment continuum” (Cowen, 1994, p. 171; also see Norris et al., 2008), often referring to one's ability to successfully function (adapt to, adjust and manage) in daily life. The literature has also been guided by conceptualizing the indicators of psychological wellness or “well-being” as a form of positive functioning that either distinguishes between positive and negative affect or emphasizes a more cognitive factor deemed as life satisfaction (see Bradburn, 1969; Choi et al., 2011; Huppert, 2009; Ryff & Keyes, 1995). In general, psychological well-being has been associated with physical health status, biological risk factors, age, gender, marital status, extraversion (sociability), education level, and socioeconomic status (Choi et al., 2011; Huppert 2009, Ryff & Keyes, 1995; Ryff, 2014); along with how to enhance it through a comprehensive framework and behavioral interventions (see Bolier et al., 2013; Cowen, 1994; Weiss, Westerhof, & Bohlmeijer, 2016). Although there have been a plethora of studies on post-disaster psychological well-being outcomes regarding disaster victims (e.g., Bonanno et al., 2010; Salzer & Bickman, 1999), there is a scarcity of research on the association between psychological wellness and the acceptance of disaster misperceptions among the general public. Therefore, for the purposes of this study, psychological wellness is defined as the absence of psychological distress (Degrogatis, 2000) and includes the following factors under its' domain: resilience, spiritual wellness, perceived stress, personality, and the degree of accepting conspiracist beliefs.

Resilience

Resilience is an important adaptive component of psychological wellness that has often been viewed from the individual level in response to being exposed to adversity. In general, resilience refers to a person's capacity under normal circumstances to adapt and maintain stable levels of psychological, emotional and physical functions after experiencing a loss, a life-threatening situation or other adverse life event (Bonanno, 2004; Bonanno et al, 2010; Williams, 2007). Furthermore, resilience may also be conceptualized as an individual trait or as a psychosocial process that is associated with ongoing relationships (see Drury, 2012). The research literature has noted several robust predictor trajectories related to resilient outcomes after experiencing a traumatizing event, such as, personality (specifically hardiness), male gender, older age, higher education, limited exposure to the traumatizing event, availability of socioeconomic resources, past and current life stress, optimistic worldviews, and positive emotions (see Bonanno, 2004; Bonanno et al., 2010; Bonanno, Westphal, & Mancini, 2011; Fran et al., 2008; Galatzer, Huang, & Bonanno, 2018). At present, there are practically no studies that examine resilience on the individual level and its relationship with the acceptance of disaster myths among the general population or among disaster survivors. However, Bonanno's et al. (2011) review of literature regarding a priori beliefs suggests that having a positive worldview prior to the traumatizing event is associated with a more adaptive coping trajectory. Hence, it is plausible to assume that resilient individuals are less likely to accept disaster misconceptions at face value.

The concept of resilience can also be viewed from a socio-organizational context and is often referred to as "community resilience" which describes the adaptive capacities of networked resources within the community infrastructure (Drury, 2012; Kendra, Clay, & Gill, 2018; Norris et al., 2008). In other words, community resilience is a set of networked resources that include

economic development, social capital, information and communication, and community competence capacities that hinge on their robustness, redundancy and mobilization ability of available resources (Norris et al., 2008).

Drury (2012) has also paired resilience at the community level with a vulnerability framework that stresses the public's inherent social and psychological weaknesses and potential risks, which is often used to assert that during disasters people's collective reactions will take the form of disaster misconceptions (i.e., widespread civil disorder and chaos). In fact, Drury (see Drury, 2012) has advocated a Social Identity model of collective (community) resilience which implies that during a disaster, the impacted population will more likely bond together and act as one due to their shared identity from the threat and as a consequence, will adapt a "we" mentality that will empower a collective action to help each other. This type of collective resilient behavior is common after a major disaster (Alexander, 2007; Cole, Walters, & Lynch, 2011; Drury, Cocking, & Reicher, 2009; Jacob et al., 2008). Drury et al. (2013) also found in their study that groups of police officers, civilian crowd safety professionals, sports events stewards and college students tend to believe that during emergencies the following resilience behaviors occur: people behave orderly, act pro-socially to help others, become heroic, rely on their own knowledge during an evacuation, and come together in solidarity.

Spiritual Wellness

A construct that is associated with psychological wellness is spiritual wellness. Spiritual wellness or "well-being" is defined as a person's perceived quality of spiritual life in the areas of his or her relationship with God or what they understand that to be and his or her feeling of satisfaction with life or purpose in life (Ellison, 1983; Paloutzian & Ellison, 1991). In general, spiritual wellness is associated with helping individuals cope with a wide range of stressful

situations and illnesses; instilling negative events with meaning and purpose; reducing depression, stress and anxiety; as well as increasing well-being and positive emotions (see Koenig, 2012, Paloutzian, Bufford, & Wildman, 2012, and van Dierendonck & Mohan, 2006). Furthermore, research has also shown that people use more positive religious coping mechanisms (i.e., seeking spiritual support or collaborative religious coping) to help assist them with managing major life stressors (Pargament et al., 1998).

As far as spiritual wellness' connection with disaster events, the majority of studies have focused on post-disaster outcomes related to traumatization which have found: positive religious coping linked to lower depression, less "poorer" quality of life, decrease in alcohol use and lower PTSD (Henslee et al., 2015); spiritual involvement and practicing one's faith is related to higher levels of posttraumatic growth (O'Grady et al., 2012); and the way a person views God (Aten et al., 2015). Unfortunately, there is a paucity of research literature that specifically examines the role of spiritual well-being in contributing to the acceptance of believing in disaster myths. However, Aten et al. (2015) cited several studies in which disaster victims' reaction to the disaster was influenced by their religious and spiritual appraisal of the event, such as attributing the Haiti earthquake in 2010 to God by citing prophetic references from the Bible to make sense of the disaster. This may suggest that a person's spiritual wellness could influence his or her level of accepting misconceptions about disaster behaviors.

Perceived Stress

Numerous research studies have associated past and present life stress with increased risk for PTSD (Brewin et al., 2000; Ozer et al., 2003); however, practically no studies have examined how life stress is linked to the acceptance of disaster myths. One possible explanation in terms of how belief in disaster misconceptions is related to one's perception of life stress comes from the

stress-diathesis framework which “explains how individuals respond to and adapt to stressful life circumstances” (Buchanan & McConnell, 2017, p. 101). According to the stress-diathesis approaches, life events (i.e., perceived stress) may interact with individual differences (i.e., degree of psychological wellness) to predict belief in disaster misconceptions (i.e., Benight & Bandura, 2004; Coyne & Downey, 1992; Folkman, 1984; Mark & Smith, 2008). In other words, individuals with vulnerabilities in overall wellness and resilience may experience more susceptibility to accepting disaster myths as truth when they witness major disaster events occurring compared to those with more constructive characteristics who may experience better adaptability.

Personality

Personality traits are presumed to be stable over time and is considered a risk and resilience factor that contribute to an individual’s coping process after experiencing a traumatic event (Bonanno & Mancini, 2008). In fact, Bonanno et al. (2011) cited the research of Mischel (1969) who observed that personality explains 10% of the variance in an individual’s behavior across situations. Bonanno et al. (2010) also indicated that traits of hardiness, the ability to regulate emotional expression across situational demands, and having a sense of control of mastery were important factors in wellness outcomes after experiencing a disaster event. However, virtually not studies have examined how personality traits are associated with the acceptance of disaster myths among the general public. Hence, the well-researched five-factor model of personality may be a more promising approach to address this connection.

The five-factor model utilizes a hierarchal organization of broad personality traits in five domains: extroversion, agreeableness, conscientiousness, neuroticism and openness (McCrae & Costa, 1999; McCrae & John, 1992). For instance, persons high in extraversion tend to be

gregarious and exhibit positive emotions, while those low in neuroticism have a general tendency for fluctuating moods and low self-confidence. In relations to disaster events, Kopala-Sibley and his colleagues' (2016) study, as well as their review of literature suggest that the constructs of neuroticism (i.e., negative emotionality) and extraversion (i.e., positive emotionality) may influence one's level of vulnerability to depression after experiencing a disaster event (i.e., Hurricane Sandy). Research has also found the trait of openness to be positively linked with greater posttraumatic growth in trauma survivors (Tedeschi & Calhoun, 1996). Furthermore, Jakšić et al. (2012) indicated that PTSD symptoms are negatively related with extraversion, conscientiousness, self-directedness, the combination of high positive and low negative emotionality, hardiness and optimism. Although these studies do not address pre-disaster event personality traits that are connected with belief in disaster myths per se, it may be safe to assume that traits such as neuroticism, extroversion and openness may perhaps play a role.

Conspiracist Beliefs

Another factor that might influence the acceptance of disaster myths is the belief in conspiracies. In general, conspiracist beliefs or "conspiracist ideation" is typically described as a belief in the existence of a wide, insidious conspiracy system designed to perpetrate malevolent acts when other explanations about a situation or event are more plausible (Aaronovitch, 2009; Hofstadter, 1966). According to Brotherton, French and Pickering (2013), a large number of people endorse conspiracy theories (i.e., 9/11 was perpetrated by the U.S. government or Lee Harvey Oswald was not the mastermind behind the assassination of President John F. Kennedy). Researchers have also found that individuals who endorse one conspiracy theory tend to believe in or are exposed to others (Goertzel, 1994; Swami et al., 2011).

Belief in conspiracist ideation has been associated with: feelings of alienation, powerlessness, hostility and being disadvantaged (Abalakina-Paap et al., 1999); as a means to attain a sense of uniqueness (Imhoff & Lamberty, 2017; Lantian et al., 2017); dispositional explanations that relate the occurrence of the event within the context of the intended scheme (Clarke, 2002); lower levels of education (Van Prooijen, 2017); age and ethnicity (Goertzel, 1994); higher political cynicism, greater support for democratic principles, negative attitudes towards authority and poor self-esteem (Bruder et al., 2013; Swami et al., 2011); and the personality traits of lower agreeableness and higher openness (Bruder et al., 2013; Brotherton et al., 2013; Swami et al., 2011). Furthermore, Franks, Bangerter and Bauer (2013) suggest that the reason conspiracy theories are retained is because they are considered quasi-religious representations based on how their contents, forms and functions parallel institutionalized religions. Just as situations or events are interpreted as being caused by supernatural agents within religious representations, so are events seen as resulting from the actions of a malevolent faction that threaten the innocent group according to conspiracist theories.

The Present Study

Over the past several decades literature regarding social behavior during catastrophic events has steadily increased; however, as stated earlier, there is a dearth of research literature that examines specific psychological well-being factors that may make an individual more susceptible to adapting erroneous perceptions about the behaviors people engage in during disaster events. Such misconceptions among the general population and the professionals responsible for responding to and managing disaster events may have a detrimental effect on the response and recovery endeavors. Therefore, the present study will examine how the psychological wellness factors of psychological distress, resilience, perceived stress, spiritual

well-being, personality and acceptance of conspiracist beliefs predict the degree of misconception about human behavior during disaster events among the general public.

Research Hypothesis

How does age, a maturation characteristic, impact reactive, proactive, and overall resilience levels? We posited that age would be positively correlated with reactive, proactive, and overall resilience levels.

Methodology

Participants

An a priori statistical power analysis using an effect size of Cohen's $f^2 = 0.15$ and power set at 0.80 estimated that a minimum of 68 subjects was needed to detect a moderate occurrence. Therefore, at least 68 subjects or more will be collected from both, MTurk and the BSRSP, for minimum total of 136 subjects. Data was collected from 300 participants who filled out a detailed questionnaire through Amazon's Mechanical Turk (MTurk) platform and from the Behavioral Sciences Research Subjects Pool (BSRSP). In regards to the BSRSP, the educational goal of the pool is to expose students to research in a variety of topics. Subjects in the pool receive a maximum of two credits for participating in one or more studies available in the pool. All participants were over 18 years of age and residing in the United States. They were all compensated (\$0.30) for their participation.

Measures

Participants will complete a demographic questionnaire that assesses age, gender, ethnicity, marital status, religious affiliation, level of education, employment status, occupation, household income, aid to disaster victims question and media use questions. Nine other

measures will be used to assess the general areas of misconception, resilience, and psychological well-being.

Misconception measures

Myth and Misconception Propositions about Disasters Questionnaire (MMPD). The 19-item MMPD was developed by Alexander (2007) to assess one's beliefs about the impact of disasters and disaster management (See Alexander, 2007, p. 97 for the complete wording of each disaster misconception and corresponding debunking explanation). Participants are asked to rate their reaction to each item (e.g., "Disasters are truly exceptional events" and "When disaster strikes panic is a common reaction") using a 5-point Likert scale ranging from 1 (strong disagreement) to 5 (strong agreement). The original study used the data to examine mean scores and the standard deviation to illustrate the degree of dispersion for each myth. There were no psychometric properties reported regarding the validity and reliability of the measure. For the purposes of this study, a total MMPD score will be calculated by summing the score on each item, with higher scores indicating greater belief in disaster misconceptions.

Beliefs about Disaster Response (BDR). The 8-item BDR was organized by Wenger et al. (1975) to assess one's degree of insight into natural disaster response. Participants are asked to agree or disagree with each of the eight items (e.g., "A major problem community officials confront when faced with a natural disaster is controlling the panic of people fleeing from the danger area"). The original study utilized telephone interviews to gather responses on all eight items. Each item was analyzed as frequency data as it pertained to a specific disaster myth. There were no psychometric properties reported regarding the validity and reliability of the measure. For the purposes of this study, participants are asked to rate each item on a 6-point Likert scale ranging from 1 (strongly disagree) to 2 (strongly agree). A total BDR score will be

calculated by summing the score on each item, with higher scores indicating greater lack of insight into natural disaster response and greater support of disaster myths.

Resilience measures

10-item Conner-Davidson Resilience Scale (CD-RISC10). The 10-item CD-RISC10 (Campbell-Sills & Stein, 2007) is the shorter self-report version of the original 25-item CD-RISC (Connor & Davidson, 2003) that was designed to measure an individual's perceived ability to cope with adversity. Participants are asked to rate their agreement with 10 statements that apply to them over the last month (e.g., "I am able to adapt when changes occur" and "I can deal with whatever comes my way") on a 5-point Likert scale ranging from 0 (not true at all) to 4 (true nearly all the time). Scores on all items are summed to provide a total score with higher scores indicating greater resilience. The CD-RISC10 has demonstrated good convergent, discriminant and predictive validity, decent test-retest reliability, and good internal consistency with a Cronbach's alpha of 0.89 (Conner & Davidson, 2003).

Beliefs about Resilient Behaviors Subscale of the Behaviour in Mass Emergencies Questionnaire (BRB). The BRB is a 9-item subscale of the Behaviour in Mass Emergencies questionnaire (Drury et al., 2013) that assesses beliefs about five types of resilient behaviors during disasters. The five types of resilient behaviors include: orderliness (two items, e.g., "When there is an emergency, mass evacuations tend to be orderly"); cooperation (one item, e.g., "When there is an emergency, crowd survivors pro-socially assist one another"); heroism (one item, e.g., "When there is an emergency, examples of heroism among survivors take place"); evacuation behavior is knowledge-based (one item, e.g., "When there is an emergency, people in a crowd draw upon their knowledge of (e.g.) building layout"); and people come together in emergencies (three items, e.g., "Emergencies and disasters bring people together in solidarity"). Participants are

asked to rate their agreement with each item using a 7-point Likert scale ranging from 1 (disagree strongly) to 7 (agree strongly). The original study utilized the scale midpoint (4) to operationalize beliefs about resilience, thus focusing on the means and standard deviations for responses to the items. In regards to the psychometric properties of the measure, only a correlation coefficient was reported for the domain of orderliness ($r = 0.78$, $p = .001$) and a coefficient alpha of 0.82 was reported for the people come together in emergencies domain (Drury et al., 2013). For the purposes of this study, a total BRB score will be calculated by summing the score on each item, with higher scores indicating greater belief in resilient behaviors during disaster events.

Psychological wellness measures

Two-item Perceived Stress Scale (PSS). The PSS (Buchanan & McConnell, 2017) is a 2-item self-report measure of a participant's level of perceived stress. Participants are asked to respond to the statement, "I consider myself _____" on a 7-point Likert scale ranging from 1 (not a very stressed person) to 7 (a very stressed person), and then to the statement, "I consider myself _____" on a 7-point scale ranging from 1 (less stressed) to 7 (more stressed). The mean of these two items is calculated, with larger scores indicating higher perceived stress. Buchanan and McConnell (2017) reported good internal consistency at 0.92.

Spiritual Well-Being Scale (SWBS). The SWBS (Paloutzian & Ellison, 1982) is a 20-item self-report measure of an individual's perception of their quality of spiritual life. Participants are asked to rate 18 statements (e.g., "I don't find much satisfaction in private prayer with God" and "I have a personally meaningful relationship with God") that best indicates the extent of their personal experience on a 6-point scale ranging from 1 (strongly disagree) to 6 (strongly agree). The SWBS has two subscales (Religious Well-Being and Existential Well-Being) containing 10

items for each. A total score is calculated by summing scores for all positively and negatively worded items. The same is also done for each subscale. Higher scores are indicative of higher spiritual well-being. The SWBS has good face validity and is correlated with self-concept, sense of purpose in life, physical health and emotional adjustment (Bufford et al., 1991; Paloutzian & Ellison, 1991). This measure has also been demonstrated to have good test-retest reliability and high internal consistency, with coefficients alphas ranging from 0.89 to 0.94 on the overall scale and from 0.78 to 0.94 on both subscales (Bufford et al., 1991).

Brief Symptom Inventory 18 (BSI-18). The BSI-18 (Derogatis, 2000) is an 18-item self-report screening measure for psychological distress. Participants are asked to rate 18 statements (e.g., “Faintness or dizziness” and “Pains in heart or chest”) that they considered distressing or bothersome to them during the past seven days on a 5-point Likert scale ranging from 0 (not at all) to 4 (extremely). The BSI-18 has three subscales (Somatization, Depression and Anxiety) containing six items for each dimension. The BSI-18 total score or global severity index (GSI) is calculated by summing the score on all items which can be converted to a T score for interpretation. Higher scores are indicative of greater psychological distress. The BSI-18 has demonstrated good convergent-discriminant and predictive validity, good test-retest reliability, and satisfactory internal consistency with a GSI alpha coefficient of 0.89 and subscale coefficients ranging from 0.74 to 0.84 (Derogatis, 2000).

Ten-item Personality Inventory (TIPI). The TIPI (Gosling et al., 2003) is a brief self-report measure of the Big Five personality domains: Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness to New Experiences. Participants are asked to rate a pair of traits (e.g., “Extraverted, enthusiastic” and “Reserved, quiet”) that apply to them using a 7-point Likert scale ranging from 1 (disagree strongly) to 7 (agree strongly). A total score for each

domain is calculated by summing the positively scored and reverse-scored items and then dividing by two. Higher scores are more indicative of that particular personality trait dimension. The TIPI has been found to demonstrate adequate convergence, content and predictive validity, decent test-retest reliability, but low internal consistency coefficient alphas (Gosling et al., 2003). For the extraversion subscale, a cronbach's alpha of .68 was reported. Agreeableness was found to have a cronbach's alpha of .40, conscientiousness was found to have a cronbach's alpha of .50, emotional stability had the highest cronbach's alpha of the subscales of .73, and openness to experiences reported a cronbach's alpha of .45. Gosling and his colleagues noted that the TIPI was intentionally developed to be brief and optimize validity, especially for situations where short measures are needed, personality is not the main subject of interest, or the diminished psychometric properties is tolerable.

Generic Conspiracist Beliefs Scale (GCBS). The GCBS (Brotherton et al., 2013) contain 15-items that measure individual differences in conspiracist ideation. Participants are asked to rate their degree of belief on each of the 15 items (e.g., "The government is involved in the murder of innocent citizens and/or well-known public figures, and keeps this a secret" and "Evidence of alien contact is being concealed from the public") using a 5-point Likert scale ranging from 1 (definitely not true) to 5 (definitely true). A total score is calculated by summing the score on all items, with higher scores indicating greater belief in conspiracist ideation. The GCB has demonstrated sound content, criterion-related, convergent and discriminant validity, good test-retest reliability, and decent internal reliability, with an alpha coefficient of 0.95.

Research Design and Procedure

This study utilized a non-experimental, exploratory survey research design. Upon receiving IRB approval, the MTurk survey link to the study through LimeSurvey was activated.

Participants who selected the survey were given informed consent regarding the nature of the study, the number of questionnaires and the time require to complete them, the risk involved and the consequences for not completing the study once it is started, that participation is voluntary, their responses will be kept confidential and analyzed as group (rather than individual) data, and that all participants must be 18 years of age or older. Upon providing electronic consent, participants completed the 10 questionnaires which included a quality control measure to ensure response reliability. Once participants completed all measures, they will submitted a randomly generated survey code to MTurk to indicate that the study has been completed in order to receive compensation of \$0.30.

For participants in the BSRSP, they selected the study from the pool's website to access it through LimeSurvey. Participants who selected the study were given the same informed consent as the MTurk subjects and upon providing electronic consent, they opted to complete the 10 questionnaires which includes a quality control measure to ensure response reliability. Upon completing the study, the BSRSP participants received research credit for their participation. Overall, the study will take approximately 30 minutes to complete.

Statistical Analysis

Multiple regression analysis was used to examine how well the psychological wellness factors of psychological distress, resilience, spiritual well-being, perceived stress, personality and conspiracist beliefs variables predict perceptions regarding disaster misconceptions based on the MMPD and ***.

Benefits

There are no direct benefits for the participants. In regards to the literature, there is a dearth of studies that examine psychological well-being variables that contribute to the

misconceptions about disaster behaviors. This study will provide further insight on which variables may best predict susceptibility to disaster myths. Based on the results of this study, emergency managers and disaster mental health responders will be able to develop best practices to educate and train the public and first responders about appropriate mass emergency behaviors in order to reduce the vulnerability of a community in times of major catastrophes.

Protection of the Welfare of Subjects Unable to Give Consent

Subjects who are under the age of 18 or lack the capacity to give consent will not be allowed to participate in the study.

Risks and Discomforts

There are no physical or mental risks to subjects who participate in this study.

Minimizing Risks and Discomforts

As stated, there are no risks or discomforts to subjects who participate in the study. All personal data that is collected will be coded and stored in a secure location in the BHSC Research Center. Participants will be told through the informed consent form of this, as well as that participation is voluntary, and upon completion of the study MTurk participants will be compensated with \$0.30 paid to their account, while BSRSP participants will receive research participation credit. Participants will also be told that they may choose to stop participating in the study at any time, however, they will not receive any compensation or participation credit as a consequence.

Results

The survey was administered online through MTurk. Data was collected by the researchers from MTurk and SPSS was used to analyze this data.

Participant Demographics and Descriptive Statistics

Fifty-three percent of participants were male ($n = 161$), 46% were female ($n = 138$), and 0.3% were third gender/non-binary ($n = 1$). The M_{age} of participants was 33.6 years ($SD = 10.0$) and ranged from 18 to 68 years. Around 45.7% had graduated college, 15.7% had completed a post graduate degree, 15.3% had some college, 8.7% had some postgraduate work, 7.7% were high school graduates or had gotten their GEDs, and 1.3% had some high school. Forty-six percent were married, 38% were single, 8.7% were in a dating relationship, 2.7% were engaged, 2% were divorced, 1.3% were separated, and 1% were widowed.

Of the 300 participants, 35% were Catholic, 25.5% identified themselves as not belonging to any religious affiliation, 16.8% were Protestant, 15.3% were Other Christian, 3.6% were Hindu, 1.3% were Muslim, and 2.5% identified as other. Sixty-three percent of participants identified themselves as White (non-Hispanic), 16.5% were Asian/Pacific Islander, 8.8% were American Indian/Alaskan Native, 6.4% were Black or African American, 4% were Latino/Hispanic, and 1.3% were other Multi-ethnic.

Seventy-five percent of participants were employed full-time (32+ hours per week), 11.7% were employed part-time, 6.6% were unemployed, 4.8% were students, and 2.4% were disabled. Twenty-two percent of participants were in Management, Business, and Financial Operations, 21% were in Computers, Information Technology, and Mathematics, 7.3% were in Sales, 7.3% were in Office and Administrative Support, 6.9% were in Education, 6.5% were in Medical and Healthcare Services, 6.1% were students and 22.9% were involved in other fields like architecture/engineering, legal, construction, food services, social and community services, and arts/design, entertainment/sports, and media among other occupations.

Fifty-nine percent of participants had an annual household income between \$20,00 to \$69,999 and 93% were between \$10,000 to \$149,999 with a relatively even distribution between

\$10,000 to \$79,999 and a median of \$45,000. Participants were required to be at least 18 years old and live in the United States.

Hierarchical Regression Analysis

Three hierarchical regressions were run on the data with the dependent variables being conspiracist beliefs (GCBS), beliefs about disaster response (BDR), and disaster myths beliefs (MMPD). **After controlling for age, hierarchical regressions revealed that age did not significantly contribute to overall resilience, or to either the proactive or reactive resilience pathway ($R^2 = 0.016$ for the full model). However, variables that measured innate well-being traits contributed significantly to predicting resilience for both pathways (Proactive $R^2 = .454$ and Reactive $R^2 = .390$). This implies that age is not a protective resilience fact, but rather the robustness of one's well-being traits when facing adverse life events.**

.741 cronbach's alpha for BDR and .868 cronbach's alpha for MMPD and .897 cronbach's alpha for STRESS and .976 cronbach's alpha for BSI and .894 cronbach's alpha for SWBS and TIPI .682 (not supposed to be used as a group) and .870 BRB and .899 CDRISC and .956 GCB and .676 media use and media reliable .721.

In order to better understand the collected data, both pathways were split into two steps. The first step measured innate well-being traits (i.e. subjective happiness, self-acceptance, purpose in life, perceived stress, relationships with others, and overall psychological distress) and the second step measure physical actions taken by participants that were thought to enhance or predict high levels of resilience (sleep, fitness, nutrition, and spirituality). The first steps, consisting of well-being traits, were better contributors to overall resilience than the second steps in both cases. The implications of this are that physical actions have less to do with overall resilience than internal *emotional* states.

In regards to the Proactive Resilience Pathway, the present study found that Self-Acceptance ($p < 0.01$) and Happiness ($p < 0.001$) significantly predicted Resilience scores with an $f^2 = 0.818$. Purpose in Life ($p = 0.14$) was included in Step 1 but was not significant. In Step 2, Spirituality ($p = 0.22$) was not found to be a significant predictor of Resilience scores.

Looking at the Reactive Resilience Pathway, the present study found that Personal Relationships with Others ($p < 0.001$) and the BSI/psychological distress measure ($p < 0.001$) significantly predicted Resilience scores with an effect size $f^2 = 0.553$. Perceived Stress ($p = 0.164$) was included in Step 1 but was not significantly predictive of resilience levels. In Step 2, Sleep ($p = 0.117$) and Nutrition ($p = 0.232$) were not significantly predictive of resilience. However, Exercise ($p < 0.05$) significantly predicted Resilience scores with an effect size of $f^2 = 0.693$.

Based on previous research, the current researchers had posited that Personal Relationships with Others, Sleep, Exercise, Nutrition, Self-Acceptance, Happiness, Purpose in Life, and Spirituality would all be significant predictors of high levels of resilience. The current researchers had tentatively expected that high levels of Perceived Stress and the BSI (psychological distress) would be significant predictors of low levels of resilience. These hypotheses were partially supported by the data collected in this current study. Personal Relationships with Others, Exercise, Self-Acceptance, and Happiness were all found to be significant predictors of high levels of resilience. However, Sleep, Nutrition, Purpose in Life, and Spirituality were not significant predictors. Psychological distress was found to be a significant predictor of low levels of resilience, but perceived stress was not.

Step and Predictor Variable	B	SE B	β	R ²	ΔR^2	f ²
Step 1:						
SA	0.196	0.072	0.255**	0.450***	0.45	0.818
PL	0.079	0.053	0.1	0.450***	0.45	0.818
SHS	0.474	0.112	0.380***	0.450***	0.45	0.818
Step 2:						
Spirit	0.262	0.213	0.066	0.454	0.004	0.838

*p<.05 **p<0.01 ***<0.001

Step and Predictor Variable	B	SE B	β	R ²	ΔR^2	f ²
Step 1:						
PRWO	0.418	0.069	0.389***	.364***	0.364	0.553
STRESS	-0.198	0.142	-0.1	.364***	0.364	0.553
BSI	-0.11	0.034	-.243***	.364***	0.364	0.553
Step 2:						
Sleep	0.383	0.245	0.094	.390*	0.026	0.693
Exercise	0.65	0.332	.118*	.390*	0.026	0.693
Nutri	-0.107	0.09	-0.71	.390*	0.026	0.693

*p<.05 **p<0.01 ***<0.001

Discussion

This exploratory study set out to give psychologists and understanding as to which pathways best help others to build resilience. Contrary to previous research and the researchers’ expectations, age was not significantly correlated to either the proactive or reactive resilience pathways or levels of overall resilience.

Based on previous research, the researchers posited that self-acceptance, happiness, purpose in life, spirituality, personal relationships with others, perceived stress, psychological distress, sleep, exercise, and nutrition would all be significant predictors of their respective resilience pathways as well as overall resilience. However, contrary to

what was expected from the results of previous research, stress, sleep, nutrition, purpose in life, and spirituality were not significant predictors of their respective resilience pathways or of overall resilience. In alignment with previous research, the current study found that personal relationships with others, psychological distress, exercise, self-acceptance, and happiness were significant predictors of their respective resilience pathways as well as overall resilience.

One of the limitations of this study is that MTurk is an online tool used to generate subjects. The negative implications of using MTurk are that the results may not be as representative as the researchers may have liked and that subjects could have rushed through some parts of the study. Another limitation of this study is that self-reported measures were used so a subject's bias could influence what he reports. Another thing to keep in mind is that most of the subjects in this study identified themselves as White/Non-Hispanic (85.6%) so the results may not be as generalizable as the researchers would have liked. One final limitation of this study is that it was conducted on the general public. While it does provide a wealth of information on how the public handles resilience and the relationships it has with other factors, it is not specific to trauma responders. In a future study, the researchers would like to work closely with first responders in order to gain a better understanding of the role the independent factors play in both the reactive and proactive resilience pathways—as well as overall resilience.

Implications

Self-acceptance and happiness were both found to be strong predictors of the proactive resilience pathway while relationships with others, psychological distress, and fitness were found to be strong predictors of the proactive resilience pathway. For the sake

of our study, self-acceptance, can be defined as the way individuals feel about themselves, self-understanding, and awareness of weaknesses and strengths. Happiness is the level of satisfaction and contentment individuals experience in their lives. Relationships with others can be defined as the social support systems someone has in place that they can depend on if adversity strikes. Psychological distress can be defined as unpleasant or negative emotions or feelings that impair an individuals' typical level of functioning. Fitness is defined as regular exercise (i.e. running, walking, cardiovascular exercise, weight training etc.) several times a week in order to maintain a healthy lifestyle.

The implications of these findings for first responders is that age does not have an effect on resilience levels. To increase resilience levels, it is recommended that first responders take time to foster meaningful relationships with others, avoid (or seek help when needed) psychological distress, engage in exercise, practice self-acceptance, and take time to be happy.

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Figure Titles and Notes

Figure 1. Visual depiction of configurational comparative analysis *use your words 😊

Notes: The purpose of configurational comparative research is to find those configurations which minimize cases in the upper right-hand (contradictory) cell and maximize cases in the upper left-hand (consistent) cell relative to the lower right-hand (unexplained) cell.

^a 2x2 table representing the distribution of cases consistent with the set of cases with configuration of exogenous factors and the set of cases with a target outcome.

^b Consistency is the proportion of cases in the configuration set that are also in the outcome set.

^c Coverage is the proportion of cases in the outcome set that are also in the configuration set.

Table 1. Truth table for all configurations with 4 or more cases

Exogenous factors ^a				Outcomes ^b		Consistency ^c		n ^d
SA	PL	HAPP Y	SPIRIT	RE S	INV	OUT		
0	0	0	0		47%	0	17	
0	0	0	1		50%	0	4	
0	0	1	0		50%	0	4	
0	1	0	0		82%	1	11	
0	1	1	0		57%	0	7	
1	0	1	0		100%	1	5	
1	1	0	0		67%	0	9	
1	1	1	0		98%	1	98	
1	1	1	1		100%	1	39	

^a Exogenous factors defined as follows: SA = self-acceptance (0 = weak, 1 = strong); PL = purpose in life (0 = weak, 1 = strong); HAPPY = happy (0 = weak, 1 = strong); SPIRIT = spirit (0 = weak, 1 = strong).

^b Outcomes defined as follows: RES = resilience (0 = weak, 1 = strong).

^c Consistency is the percentage of cases in each specified outcome that are also in the configuration identified in the specified row.

^d n = number of cases per configuration.

Table 2. Truth table for all configurations with 4 or more cases

Exogenous factors ^a						Outcomes ^b		Consistency ^c		n ^d
PRW	STRE SS	DISTR ESS	SLEEP	FIT	NUTRI	RE S	INV	OUT		
0	0	0	0	0	0		57%	0	7	
0	0	0	1	0	0		100%	1	5	
1	0	0	0	0	0		90%	1	31	
1	0	0	0	0	1		79%	1	24	
1	0	0	0	1	0		100%	1	6	
1	0	0	0	1	1		100%	1	16	

1	0	0	1	0	0	93%	1	27
1	0	0	1	0	1	88%	1	32
1	0	0	1	1	0	100%	1	6
1	0	0	1	1	1	100%	1	17
1	0	1	0	0	0	25%	0	4
1	0	1	1	0	0	100%	1	6

^a Exogenous factors defined as follows: PRW = personal relationships with others (0 = weak, 1 = strong); STRESS = perceived stress (0 = weak, 1 = strong); DISTRESS = psychological distress (0 = weak, 1 = strong); SLEEP = sleep quality (0 = weak, 1 = strong); FIT = fitness (0 = weak, 1 = strong); NUTRI = nutrition (0 = weak, 1 = strong).

^b Outcomes defined as follows: RES = resilience (0 = weak, 1 = strong).

^c Consistency is the percentage of cases in each specified outcome that are also in the configuration identified in the specified row.

^d *n* = number of cases per configuration.

Table 3. Proactive pathway QCA solution with strong resilience as an outcome

Configurations	Consistency ^a	Raw coverage ^b	Unique coverage ^c
Strong self-acceptance, strong happy	98%	81%	81%
Weak self-acceptance, strong purpose in life, weak happy	82%	5%	5%
Overall:	97%	86%	

^a Consistency is the percentage of cases in the strong resilience outcome that are also in the configuration identified in that row.

^b Raw coverage is the percentage of cases in that configuration that intersect with the strong resilience outcome.

^c Unique coverage is the proportion that only includes cases that are not in any other configuration.

Table 4. Reactive pathway QCA solution with strong resilience as an outcome

Configurations	Consistency ^a	Raw coverage ^b	Unique coverage ^c
Strong sleep	91%	52%	9%
Strong personal relationships with others, low psychological distress	91%	83%	40%
Overall:	90%	92%	

^a Consistency is the percentage of cases in the strong resilience outcome that are also in the configuration identified in that row.

^b Raw coverage is the percentage of cases in that configuration that intersect with the strong resilience outcome.

^c Unique coverage is the proportion that only includes cases that are not in any other configuration.