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NATURAL DISASTERS, INCIDENTS OF MASS VIOLENCE, AND PREPAREDNESS
ON A COLLEGE CAMPUS:
A STUDY OF UNIVERSITY FACULTY AND STAFF

A thesis
submitted in partial fulfillment of the requirements
for the degree of Master of Arts
in Clinical Psychology
The University of Mississippi

by

Marcela C. Weber

May 2017

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ABSTRACT

The objective of this study was to examine previous disaster impact, threat perception, self-efficacy, and sex as predictors of university employees' preparedness for natural disasters and incidents of mass violence. A cross-sectional survey was conducted with faculty and staff members ($N = 410$) at a medium-sized university located in the southern United States. Employees' sex, disaster experience, impact of that experience, perceived threat, and self-efficacy were examined as predictors of actual preparedness, across a range of natural disasters and incidents of mass violence. Drawing from the Extended Parallel Process Model (EPPM; Figure 1), a moderated mediation model (Figure 2) was hypothesized and partially supported. For natural disasters, experience and sex had direct effects on perceived susceptibility (coefficients were $a1_i = .094$, $p = .001$ for experience and $a2_i = .226$, $p = .010$ for sex), but perceived susceptibility did not mediate the effect of disaster experience on preparedness behavior ($b1_i = .036$, $p = .255$), nor did disaster experience have a significant direct effect ($c' = -.038$, $p = .136$). However, both self-efficacy and disaster impact had direct effects on preparedness behavior (self-efficacy coefficient $b_3 = .243$, $p < .0001$, disaster impact coefficient $b_2 = .038$, $p = .045$), and self-efficacy further moderated the effect of disaster impact ($b_6 = .035$, $p = .015$). For incidents of mass violence, perceived susceptibility mediated the effect of experience on preparedness behavior ($b1_i = .074$, $p = .009$), when self-efficacy was high and employees were female. As with natural disasters, experience and sex had direct effects on perceived susceptibility ($a1_i = .963$, $p = .020$ for experience; $a2_i = -.255$, $p = .034$). Self-efficacy also had a direct effect on preparedness behavior ($b_3 = .150$, $p < .0001$). These results support

EPPM theory in that threat messages and perceptions correspond to increased preparedness behavior when paired with self-efficacy for responding to disasters. Therefore, it is recommended that institutions of higher education employ disaster preparedness programs that focus on educating employees with regard to cultivating accurate threat perceptions and building their confidence in responding to disasters.

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CHAPTER 1

INTRODUCTION

What Is a Disaster?

According to the United Nations (International Strategy for Disaster Reduction, 2009), a disaster is “a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources” (p. 9). However, there is a lack of consensus among researchers, policymakers, and emergency responders as to what constitutes a disaster; over 60 definitions of disaster have been catalogued by the Federal Emergency Management Agency (FEMA; Blanchard, 2006). Some of these definitions restrict the term to natural disasters, such as the Stafford Act (2013) definition of a disaster as “any natural catastrophe (including any hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought) or, regardless of cause, any fire, flood, or explosion” (National Institute of Mental Health, 2002, p. 23). Other definitions distinguish between natural, human-made, and technological disasters (Blanchard, 2006; Boscarino, 2015; Neria, Nandi, & Galea, 2008). Pandemic disease is sometimes classified jointly with natural disasters, and a distinction is sometimes made within human-made disasters between incidents of mass violence and accidents (Blanchard, 2006; Boscarino, 2015). The U.S. Department of Health and Human Services (DHHS) differentiates

acts of mass violence from accidents or technological disasters in that their causes “include evil human intent, deliberate sociopolitical act, human cruelty, revenge, hate or bias against a group, [or] mental illness” (DHHS, 2004, p. 9). Acts of mass violence include riots, hostage situations, school shootings, and bombings (DHHS, 2004). For the purpose of this study, “disaster” is defined according to the UN definition. Natural disasters are considered those resulting from forces of nature, such as floods, tornadoes, and earthquakes. The human-made disasters of primary emphasis in the current investigation constitute incidents of mass violence. Drawing from Fischer and Ai’s (2008) characterization of modern international terrorism, terrorism is defined as a subtype of mass violence that is (1) ideologically-driven, (2) committed against civilians, and (3) intended to horrify the public.

The multiplicity of term definitions is unsurprising, considering that disaster science is a new and evolving multidisciplinary field (e.g., Schulenberg, 2016; Schulenberg, Drescher, & Baczwaski, 2014). In 1989, a plane crash in Sioux City, Iowa spurred a call to develop a national plan for mental health response during disasters (Jacobs, Quevillon, & Stricherz, 1990). Disaster research increased after the terrorist attacks of September 11, 2001 (Inglesby, 2011) and continued to grow in the wake of other high-impact disasters such as Hurricanes Katrina and Sandy (Madrid et al., 2008; Powell, Hanfling, & Gostin, 2012). By 2007, Jacobs laid out seven principles for planning psychological support for disasters and other humanitarian crises, such as war-related displacement. Publications on emergency response and preparedness research have increased by 33% from 1997 to 2008 (Savoia et al., 2009). Regarding incidents of mass violence, specifically, the rise in U.S. school shootings has also contributed to an increase in research on such incidents at educational institutions (Kaminski, Koons-Witt, Thompson, & Weiss, 2010). The bulk of disaster research thus far has centered on the consequences of disasters. The aim of

this study is a focus on disaster preparedness with respect to natural disasters and incidents of mass violence. We begin this review of the literature with attention to natural disasters prior to a discussion of incidents of mass violence.

The Impact of Natural Disasters

Each year on average, more natural disasters strike the United States than any other country except China (Guha-Sapir, Hoyois, & Below, 2013, 2014). Although economic development has buffered the disaster fatality risk in the U.S. compared to other disaster-prone countries (Kahn, 2005), natural disasters such as tornadoes, hurricanes, and earthquakes result in 549 fatalities on average each year in the U.S. (National Weather Service, 2016). For example, when Hurricane Katrina struck the Gulf Coast in 2005, at least 1833 lives were lost and over one million survivors were displaced (Knabb, Rhome, & Brown, 2011). Thousands of homes and businesses were destroyed (Knabb et al., 2011), resulting in \$108 billion in overall property damage (Blake, Landsea, & Gibney, 2011). In 2012, a hurricane again wreaked major damage when Sandy struck the eastern seaboard, resulting in 117 fatalities and the displacement of 20,000 people from their homes (Centers for Disease Control and Prevention, 2013).

In addition to major hurricanes like Katrina and Sandy, other disasters pose significant threats to the United States. For example, each year approximately 123 lives are lost to heat waves, 110 lives are lost to tornadoes, and 82 lives are lost to floods (National Weather Service, 2016). Tornado risk is not localized to the “Tornado Alley” region of the Great Plains; trend analysis over the past 50 years shows that the Gulf Coast, Mississippi River Valley, and the Carolinas also frequently encounter tornadoes (Boruff et al., 2003; Sherman-Morris, Wax, & Brown, 2012). Furthermore, the Arkansas-Mississippi-Alabama region suffers the highest

tornado-related fatalities per square kilometer each year (Ashley, 2007) and Mississippi experiences more high-force tornadoes (EF4 and EF5) than any state except Oklahoma (Sherman-Morris et al., 2012).

The Arkansas-Mississippi-Alabama region is also at particular risk for other kinds of natural disasters, specifically earthquakes and flooding. For example, along with Hawai'i and the Pacific Coast, the New Madrid Fault along the central Mississippi River puts Arkansas, Mississippi, Tennessee, and Missouri at highest risk of earthquake occurrence (Frankel, Applegate, Tuttle, & Williams, 2009). The region south of the New Madrid Fault is at increased risk for flooding. While a levee system prevents major damage from Mississippi River floods, the flooding of its larger tributaries results in severe damage approximately every three years (Sherman-Morris et al., 2012). Clearly, the U.S., particularly the southeastern region of the country, is severely impacted by a range of natural disasters.

While natural disasters may result in severe injury, loss of life, displacement, and significant damage to community infrastructures, they may also cause a range of mental health issues as well. A meta-analysis on the mental health effects of disasters found that the most frequent outcomes are specific psychological problems (e.g., posttraumatic stress, depression, anxiety, and panic attacks) followed by nonspecific distress (Norris et al., 2002). Some research suggests that mental health outcomes differ by disaster type. For example, a study of European adults affected by flood, building collapse, or a terrorist attack examined both peritraumatic stress and posttraumatic stress (Grimm, Hulse, Preiss, & Schmidt, 2012). Peritraumatic stress was highest during terrorist attacks, but posttraumatic stress was highest after fire and building collapse, even when accounting for individual and community factors (e.g., severity of injuries). More recently, a meta-analysis found that posttraumatic stress disorder (PTSD) remission rates

for natural disasters are roughly equivalent to the PTSD remission rates for human-made disasters (Morina, Wicherts, Lobbrecht, & Priebe, 2014). Furthermore, remission rates vary widely by incident, but on average, approximately half of individuals who develop PTSD after a natural or human-made disaster still have PTSD three years later. Thus, natural disasters have long-term impacts on mental health even beyond the nature of the immediate impact.

Beyond disaster type, a disaster's severity of impact and characteristics of the impacted individuals predict mental health outcomes. For example, in a study of Hurricane Katrina survivors two years after the event, greater severity of PTSD was predicted by level-of-impact factors (personal injury, seeing dead bodies), by pre-disaster individual characteristics (low social support, the religious belief that disasters are punishment from God, previous trauma), and by post-disaster individual characteristics (low social support, comorbid depression; Rosellini, Coffey, Tracy, & Galea, 2014). Similarly, a survey of American adults found that cumulative disaster experience and disaster type predicted increased mental health problems, but that impact of disasters (personal injury, loss of possessions, fear during incident) were better predictors than disaster type (Briere & Elliott, 2000). Furthermore, a recent meta-analysis identified risk factors for depression after natural disasters (Tang, Liu, Liu, Xue, & Zhang, 2014). For adults, the impact-related risk factors were personal injury, property loss or damage, and witnessing injury/death. Being female, being single, the religious belief that disasters are punishment from God, poor education, and prior trauma were also identified as risk factors for depression in adults following a natural disaster. Clearly, disasters impact immediate and long-term mental health, especially for individuals who experience the event's direct impact and individuals who have pre-existing stress or trauma.

The Impact of Incidents of Mass Violence

Natural disasters are not the only threat the U.S. faces every year; incidents of mass violence are also of primary concern. The most fatal incident of mass violence to impact the U.S. in the 21st century was the terrorist attacks of September 11, 2001, in which over 2,800 lives were lost (Boscarino, Figley, & Adams, 2003). Over the past decade, acts of mass violence have continued to afflict the nation. A year after September 11, 2001, the “Beltway Snipers” terrorized the Washington, D.C. area, randomly killing 10 people and injuring three more over the course of 23 days (Federal Bureau of Investigation, 2007). In July 2012, a lone perpetrator shot 12 and injured 58 moviegoers in Aurora, Colorado, and unsuccessfully attempted to detonate explosives at a nearby apartment building (Johnston, 2016). At the Boston Marathon bombing of 2013, three spectators were killed and 264 were severely injured (Federal Emergency Management Agency, 2014). Two years later, a lone White gunman killed nine Black churchgoers at Emanuel AME Church in Charleston (Follman, Aronsen, & Pan, 2016). In 2016, the deadliest mass shooting in modern U.S. history occurred when 49 people were killed and 53 people were injured at a nightclub in Orlando, Florida (Zambilech & Hurt, 2016). A recent study by the Federal Bureau of Investigation (FBI) concluded that mass shootings in public places have been on the rise in the 21st century (Blair & Schweit, 2014). Since 1990, 74 mass shootings have occurred in the U.S. (Follman et al., 2016), and there are approximately 17 fatalities and 15 individuals injured each year in such events (Follman et al., 2016). Two of the three deadliest mass shootings in U.S. history occurred at schools (Follman et al., 2016). These incidents were the Virginia Tech massacre of 2007, in which 33 students and faculty were killed, and the Sandy Hook Elementary shooting in 2012, in which 28 students and teachers were killed. These events were preceded by the Columbine High School shooting in 1999, where 15 adolescents and teachers were fatally wounded (Follman et al., 2016).

Educational settings are at particular risk for mass shootings (Follman et al., 2016), and the past two decades have witnessed a proliferation of research attempting to improve prediction of school shootings. Much of this research has consisted of retrospective attempts to identify risk factors for school shootings, in particular by attempting to profile the typical characteristics of a school shooter (Flannery, Modzeleski, & Kretschmar, 2013; Rocque, 2012). However, there is such variance in the demographic characteristics of school shooters that attempts to model a shooter profile have been unsuccessful in effectively predicting school shootings or differentiating perpetrators of mass violence from perpetrators of other forms of violence (Daniels & Page, 2013; Flannery et al., 2013; Rocque, 2012). For example, most school shooters in the U.S. have been White males and most school shootings have occurred in suburban areas with generally low crime rates (Rocque, 2012), but these few common factors are so prevalent that they are inadequate for identifying schools as being at risk.

While attempts to profile perpetrators of shootings in educational settings have been unsuccessful, some research has pointed to characteristics of schools that are risk factors for shootings. A review of school shootings worldwide has posited that social conflicts, especially with teachers, are predictive of multi-homicide school shootings (Sommer, Leuschner, & Scheithauer, 2014). One avenue for researching school characteristics would be to compare schools where shootings occurred to those where a shooting was planned or attempted, but was averted without any violence occurring. Such comparisons are scarce, but one qualitative study of middle and high schools identified differences between schools where shootings occurred and those settings with averted school shootings (Daniels & Page, 2013). Information from qualitative interviews of administrators at 30 schools where shootings were averted was compared to an FBI report on characteristics of schools where shootings occurred. Daniels and

Page (2013) identified four key areas in which the schools where shootings occurred differed from those where they were prevented: cultural inflexibility, inequitable discipline, tolerance for disrespectful behavior, and a “code of silence.” In most cases of averted shootings, the plot was discovered when a student voiced concerns to administrators or law enforcement, or they received an anonymous tip. At schools where shootings were carried out, students were less trusting of administrators and less likely to communicate with them. It is unclear to what extent these risk factors for primary schools translate to colleges and universities. Fox and Savage (2009) posited that the larger space and population at institutions of higher education, as well as lower degrees of security and control, pose unique risk factors that are less common at primary schools. More research is necessary to substantiate the few studies on this topic, but these studies suggest that changes to school policies and administrator attitudes might be a viable avenue to address limitations in the shooter profiling research and to reduce school shootings.

While knowledge of risk factors for school shootings is limited, the outcomes of these and other incidents of mass violence are increasingly apparent. The impact extends beyond injuries and fatalities to include psychological effects. In some cases, incidents of mass violence have been followed by widespread distress, even beyond the geographic location of direct impact. For instance, the terrorist attacks of September 11 instilled fear of future mass violence not only in the areas directly affected (Boscarino et al., 2003), but also in other areas across the United States as well (Liverant, Hofmann, & Litz, 2004). A similar surge was noted following the Sandy Hook Elementary school shooting (Schildkraut & Muschert, 2014). However, not all incidents of mass violence coincide with a widespread fear of violence. For example, tourists’ fear of terrorism in Norway actually declined in the year after the Oslo/Utøya terrorist attacks of 2011 (Wolff & Larsen, 2015). While the specific predictors of widespread distress are yet to be

investigated thoroughly, recent occurrences suggest that incidents of mass violence have the potential to contribute to psychological distress even in geographic areas that are not directly affected.

Unsurprisingly, for individuals living in areas directly affected by incidents of mass violence, the psychological impact can be quite profound. For instance, a study of Boston residents (Holman, Garfin, & Silver, 2014) found an overall increase in acute stress after the marathon bombing in 2013. In another study, four months after a student at a Finnish high school shot himself and eight other students, half the female high school students and a third of the males met criteria for PTSD (Suomalainen, Haravuori, Berg, Kiviruusu, & Marttunen, 2011). With further regard for the psychological impact of these kinds of events, Lowe and Galea (2015) conducted a systematic review of PTSD prevalence rates after mass shootings in the U.S. The lowest PTSD prevalence rate they found was 9 percent of elementary school children meeting criteria, 6-14 months after a shooting at their school in 1988. The highest PTSD prevalence rate reported in the review was 64 percent, in a combined study of Virginia Tech and Northern Illinois University students two weeks after the shootings on their respective campuses.

The psychological impact of incidents of mass violence can be particularly profound for individuals who not only live or work in the affected area, but who witnessed the incident or sustained injuries from it. For example, a quarter of the survivors of the 1991 shooting at Luby's Cafeteria in Killeen, Texas met criteria for PTSD in the year after the shooting, and 18 percent continued to meet criteria for PTSD three years after the event (North, McCutcheon, Spitznagel, & Smith, 2002). With respect to Major Depressive Disorder (MDD), prevalence a few months after terrorist attacks has been found to range from 20 to 30 percent for witnesses who survived the attack (Salguero, Fernández-Berrocal, Iruarrizaga, Cano-Vindel, & Galea, 2011).

Considering the frequency and impact of incidents of mass violence in the U.S., this issue is clearly an imperative public health concern with relevance to educational institutions nationwide.

Disaster Preparedness

Research on disaster impact is an essential piece of the puzzle for identifying potential negative outcomes of future disasters and planning appropriate responses to alleviate them. However, a sole emphasis on aftermath is analogous to a public health emphasis on treating a disease that has already spread, rather than balancing this approach with an emphasis on disease prevention (Paton, 2003). Since the 1970's, there has been a multidisciplinary movement worldwide towards a model of disaster management that involves not only effective response and recovery, but prevention, preparedness, and mitigation before disasters occur (Coetzee & van Niekerk, 2012). Several versions of a comprehensive disaster management cycle have been proposed. Some break down the essential components into the four categories of prevention, preparedness, response, and recovery (Cronstedt, 2002). More recent discussions have fused the first two components, describing three stages of disaster management as preparedness, response, and recovery (Khan, Vasilescu, & Khan, 2008; Pfefferbaum et al., 2012). Other models have emphasized functional components of disaster management, rather than stages (Thorvaldsdóttir & Sigbjörnsson, 2013). Despite a lack of consensus among disaster researchers and stakeholders on the categorical distinctions between components of disaster management, there appears to be a consensus that pre-disaster risk reduction and resilience-building efforts are crucial (Cavallo, 2014; Coetzee & van Niekerk, 2012; Khan et al., 2008; Pfefferbaum et al., 2012; Thorvaldsdóttir & Sigbjörnsson, 2013). Natural disasters and incidents of mass violence will continue to occur in the future, yet the impact of these potentially catastrophic events can be mitigated by enhancing emergency preparedness efforts on both the institutional and individual levels.

Institutional Preparedness

Case studies of prepared institutions. The Boston Marathon bombing provides one example of increased institutional preparedness. In 2013, two men detonated homemade bombs within minutes of each other at two sites along the marathon route (Federal Emergency Management Agency, 2014). Three victims suffered fatalities upon impact of the explosions, and 265 people were injured. Medical response was so rapid and coordinated that nearly all critically injured individuals were transported to a hospital rapidly enough that they survived (Federal Emergency Management Agency, 2014). The Federal Emergency Management Agency (FEMA) credits this rapid, effective response to the all-hazards plan implemented at the marathon in coordination with multiple agencies and organizations. Emergency medical care available at the race had been increased after a *natural* phenomenon—a heat wave—the previous year resulted in an unusually large number of heat strokes. Thus, an intention to prepare for natural disasters contributed to increased preparedness for this incident of mass violence. Furthermore, Walls and Zinner (2013) pointed out that the mass violence of September 11, 2001, and the mass shooting incident that occurred at the Aurora, Colorado movie theater in 2012, spurred increased preparedness for violence before the Boston Marathon bombing occurred.

A case study of a university hit by Hurricane Ivan similarly suggests that disaster prevalence spurred increased institutional preparedness, which in turn mitigated disaster impact (Piotrowski & Vodanovich, 2008). The hurricane hit with such force that structural damage was severe, but safety issues were mitigated and the university resumed business as usual three weeks later. Faculty reported that the event had minimal impact on the material they covered in class, time devoted to research, ability to accommodate students, and other aspects of education. Piotrowski and Vodanovich credited the rapid recovery, in part, to effective implementation of a

functional and specific institutional emergency plan.

Both the Boston Marathon bombing and Hurricane Ivan exemplify the potential of institutional preparedness to mitigate the impact of disasters. The FEMA report on the Boston Marathon bombing and the case study of Hurricane Ivan are rare, documented examples of institutions sufficiently prepared even moderately to mitigate disaster impact. Furthermore, only one of these case studies involved an *educational* institution, so examples of school-specific institutional preparedness are even more limited. Literature on disasters that are prevented from even occurring is likewise scarce. The aforementioned qualitative study on averted school shootings (Daniels & Page, 2013) is a notable exception. As previously described, implications of this study are that improved trust and communication between students and administration might be a key to prevention of school shootings. Considering the lack of documented examples of well-prepared educational institutions, it is unclear whether recommended institutional preparedness procedures are effective in any setting, including schools.

What does institutional preparedness look like? Acknowledging the utility of increased preparedness in mitigating the adverse effects of large-scale emergencies, researchers have called for a prevention model that focuses on continuous disaster preparedness efforts to reduce the impacts of these emergencies, rather than a focus on alleviating adverse outcomes after they occur (Bowen, 2008; Pelfrey, 2005; Schulenberg et al., 2008). However, optimal preparedness efforts differ for different populations and different contexts. For example, Fox and Savage (2009) examined the recommendations proposed in the wake of the Columbine shootings to increase preparedness of educational institutions. They found that the recommended preparedness initiatives, while appropriate for high school settings, were ill-suited for institutions of higher education (Fox & Savage, 2009). For example, complete lockdowns are less feasible

on a sprawling campus than in a one-building high school. Large campuses also require more attention to mass communication of threat alerts. Furthermore, Alba and Gable (2011) found differences in implemented emergency preparedness procedures across elementary, middle, and high school settings; elementary schools were more likely to have higher external security (such as restricted access), but high schools were higher in internal security (such as annual emergency drills and interactive training). While high security may be an appropriate means of protecting young children during emergencies, training and drills are more suitable for adolescents and young adults. Thus, both the recommended procedures for optimal preparedness and the actual preparedness of schools appear to differ between specific levels of educational institutions (even when controlling for rural vs. urban differences). Moreover, a national survey of college and university provosts found that universities generally are only prepared for those crises that have occurred on their campuses, but not necessarily those that occur most frequently (Mitroff, Diamond, & Alpasian, 2006). Therefore, it is important to examine institutional preparedness by education level, and when doing so, to address features of preparedness that are relevant to institutions of primary or higher education.

Emergency plans. At the institutional level, most higher education emergency preparedness research has emphasized the development of emergency plans. The aforementioned prevention model calls for emergency plans as a critical component of emergency preparedness (Bowen, 2008; Pelfrey, 2005). Thus, it is unsurprising that much of the literature on the preparedness of institutions of higher education has focused on the importance of establishing comprehensive all-hazards plans that address not only frequent problems but also rare crises such as school shootings (Borum, Cornell, Modzeleski, & Jimerson, 2010; Mitroff et al., 2006; Seo, Torabi, Sa, & Blair, 2012). These plans are an important first step, and the previously mentioned

Hurricane Ivan study exemplifies the atypically low impact of a severe hurricane when an emergency plan was well implemented (Piotrowski & Vodanovich, 2008). Unfortunately, even when emergency plans are in place, often they are not well known to faculty, staff, and students (Burruss, Shafer, & Giblin, 2010; Seo et al., 2012). A case study conducted after a campus bomb threat and lockdown credited poor outcomes, in part, to a lack of a clear and well-known emergency plan (Baer, Zarger, Ruiz, Noble, & Weller, 2014). Considering that this first step in institutional preparedness is often lacking (whether due to lack of development, dissemination, or execution), research on higher education disaster preparedness should first examine the utility of existing emergency plans in establishing adequate preparedness standards. These preparedness standards can then serve as a benchmark for assessing disaster preparedness of individuals—including students, faculty, and staff—as well as factors related to their preparedness.

The University of Mississippi Natural Hazards Mitigation Plan (UM-NHMP). The University of Mississippi is a prominent institution of higher education located in northern Mississippi. It is a prime example of an educational institution that is often affected by natural disasters, and one that may be directly affected by a future incident of mass violence. In order to account for institutional preparedness and particular standards of individual preparedness, the University of Mississippi's natural hazards mitigation plan is outlined (Swann & Mullen, 2014). The UM-NHMP addresses 16 hazards, most of which would be categorized as natural disasters (e.g., tornado, flood) and some of which would be categorized as technological (e.g., dam failure) or even human-made disasters (e.g., some wildfires). The university has a separate, established emergency *response* plan with specifications for natural disasters and incidents of mass violence (B. Russo, personal communication, October 4, 2016); however, the *mitigation* plan does not address violence on campus and the University does not have a written mitigation

plan for incidents of mass violence. The UM-NHMP addresses risk assessment, vulnerability assessment, opportunities for mitigation, and maintenance.

Risk assessment. The UM-NHMP first identified the types of hazards that are applicable to the location of the university (such as earthquake or dam failure) and those that do not apply (such as avalanches or coastal storms). Each applicable hazard was assigned a likelihood rating and a mitigation priority rating. The highest likelihood ratings were “medium” for earthquakes, hailstorms, tornadoes, wind, and severe winter storms. The hazards of highest mitigation priority were tornadoes and earthquakes (high priority), followed by wildfire, lightning, wind, severe winter storm, and hailstorm (medium priority). Each hazard was described in detail.

Vulnerability assessment. Secondly, the UM-NHMP then identified all buildings and other structures of the university (such as water towers) and rated their importance based on high concentrations of people, expense of the building and equipment therein, and the structure’s utility during a disaster. Each structure was assessed for vulnerability to the applicable hazards. The hazards with the potential to exact the greatest losses at the university were earthquakes, tornadoes, and straight-line winds.

Opportunities for mitigation. Projects outlined in the original UM-NHMP created eight years prior were revisited for their completion, ongoing continuation, and current relevance. The greatest concern was that new construction in the past eight years had not followed the original UM-NHMP’s recommendations. For example, it was predicted that newer residence halls were more likely (31%) than older residence halls (13%) to be damaged by a tornado. New projects were presented in the latest iteration of the UM-NHMP, including a yearly emergency response exercise for all university staff.

Maintenance. Specific projects were organized into seven overall goals, such as reducing

vulnerabilities pertaining to records and research data, and incorporating the UM-NHMP as a standard operating procedure. A cost-benefit analysis and other criteria (such as relevance to people with disabilities) were used to rank the priority of mitigation projects.

Implications for faculty and staff preparedness. The UM-NHMP is thorough and functional, providing specific projects and considering both importance and feasibility. However, the plan does not focus on mitigation strategies or projects pertaining to incidents of mass violence as they are outside the document's scope, and therefore they are not included in the risk and vulnerability assessment (B. Russo, personal communication, October 4, 2016).

Additionally, the UM-NHMP committee recognized that a single disaster would likely cost more than the mitigation budget. Furthermore, the current, revised plan explicitly acknowledged that the original document was not effectively applied to the construction of new buildings on campus. Despite this limitation, the UM-NHMP still has relevance to individual disaster preparedness. First, it provides a benchmark for assessments of perceived threat by identifying the disasters most likely to occur and most likely to exact severe damage and loss. Secondly, progress reports on specific projects revealed that training and preparedness efforts aimed at faculty and staff had yet to occur at the time the present study was conducted.

Individual Preparedness Theory: The Extended Parallel Process Model

At least four behavioral theories have been proposed for individual disaster preparedness (Ejeta, Ardalan, & Paton, 2014). In particular, the Extended Parallel Process Model (EPPM; Witte, 1992; Figure 1) is one that has been well modeled for a variety of health behaviors, such as HIV/AIDS campaigns and cancer information avoidance (Popova, 2012; Roberto, 2013). Introduced in 1992 by Kim Witte, the EPPM theorizes that external threat stimuli are processed

via two appraisals – perceived threat and perceived efficacy. Both higher perceived threat and higher perceived efficacy are necessary for an individual to respond to a perceived threat. In this way, the model borrows from Bandura’s self-efficacy theory, developed decades prior (Bandura & Adams, 1977). At the time of its inception, Witte’s model was unique in its differentiation of fear (as a negative emotion) and threat perception (cognitive appraisal that a threat exists). If perceived threat is low, the individual will not be motivated to act. If perceived threat is high, efficacy (of the self and the response) is appraised. Individuals whose perceived efficacy is low will become afraid; they either will remain afraid or will alleviate this fear by rejecting the threat perception. If perceived efficacy is high, the individual will attempt to protect against the perceived threat.

Recently, the EPPM has been applied to disaster preparedness research (Roberto, Goodall, & Witte, 2010). Beatson and McLennan (2011) concluded that it was one of several behavioral theories useful in explaining the limitations of campaigns for Australian bushfire preparedness. Erret et al. (2011) applied the EPPM to a study of health department and hospital workers’ willingness to respond to emergencies. They presented scenarios of a pandemic disease and a radiological bomb to health department and hospital workers, who had been trained to respond to such emergencies. They found that healthcare workers who perceived they would be unprepared for the psychological consequences (i.e., distress) of responding were more willing to respond if they had high self-efficacy and believed their family members had high self-efficacy. In other words, even trained healthcare workers may be reluctant to respond to disasters if they do not have sufficient levels of self-efficacy. Application of the EPPM to healthcare workers’ disaster response training was again proposed in 2015 (Walsh et al.).

Although the EPPM has only recently been explicitly applied to disaster preparedness,

the main components of the model—perceived threat and perceived self- and response-efficacy—have been examined in numerous qualitative, quasi-experimental, and some experimental studies. A representative survey of 14 states found that higher perceived household preparedness, as well as multiple demographic factors, was associated with having more disaster preparedness supplies in the home (DeBastiani, Strine, Vagi, Barnett, & Kahn, 2015). In this example, higher perceived preparedness correlated with higher actual preparedness. A survey on general disaster preparedness of adults in five states across the U.S. found that perceived preparedness (i.e., self-efficacy for disasters) was a significant predictor of being more prepared, yet only half of those who believed they were prepared actually were (Ablah, Konda, & Kelley, 2009). Perhaps the lack of perceived threat could account for the low actual preparedness behavior of those who believed they were prepared. In a literature review on natural and technological disaster preparedness, Wachinger, Renn, Begg, and Kuhlicke (2012) described a “risk perception paradox” in which individuals who perceive disaster risk to be high do not necessarily act to prepare themselves or to mitigate the potential impact of a disaster. Furthermore, Wachinger et al. found that salience factors (e.g., media coverage, previous experience) were associated with perceived likelihood of a disaster occurring, but perceived likelihood was not associated with perceived risk (i.e., threat) or preparedness endeavors. Additionally, confidence in protective measures (such as trust in authorities) was associated with decreased risk perception. According to the EPPM, self-efficacy might account for the discrepancy Wachinger et al. found between risk or likelihood perceptions and preparedness behavior. Furthermore, some studies show support for the EPPM theory that fear is not related to effective response to threats. A study conducted one year after the September 11 terrorist attacks found that New York City residents who reported greater fear of terrorism were more likely to

flee prior to an evacuation order, while those with lower fear levels were more likely to seek and comply with evacuation instructions. This suggests that fear might contribute to disaster response behavior, but not necessarily the most effective response (Boscarino et al., 2003). This was corroborated by the results of a training program in an earthquake-prone region of Turkey that focused on accurate risk perception, but not self-efficacy or ways to prepare (Karanci, Aksit, & Dirik, 2005). At a one-year follow-up after the training, those who completed the training were more worried about earthquakes and had higher risk perceptions than the control group; however, rates of engagement in a wide range of earthquake preparedness behaviors were low for both the training and control groups. The findings from the aforementioned studies (Ablah et al., 2009; Debastiani et al., 2015; Wachinger et al., 2012) are in accord with the EPPM concept that perceived threat, in the absence of perceived self-efficacy, will not result in increased effective response (i.e., preparedness behaviors), and unless disasters are perceived as dangerous, awareness of their presence or possibility will not result in increased preparedness behaviors. Likewise, the findings regarding the lack of an association between fear or worry and increased preparedness support the EPPM concept that risk perception, in the absence of self-efficacy, leads to fear.

The more recent version of the EPPM proposes that the external stimulus, or threat message, includes information on self-efficacy, response efficacy, susceptibility, and severity (Popova, 2012). Consideration of prior disaster experience as a threat message is one viable way of interpreting the mixed findings on experience and preparedness. For example, associations between previous experience and perceived threat are mixed and inconclusive, but higher *impact* of disaster experienced is consistently associated with increased preparedness (Kohn et al., 2012; Wachinger et al., 2012). One way to interpret this complexity is that experience of high-impact

disasters sends a message that disasters are severe and the individual is susceptible, while averted or low-impact disasters send the opposite message. Furthermore, associations between media exposure, but not direct impact, and preparedness suggest that messages of susceptibility and severity are the key, not actual experience (Wachinger et al., 2012). Dillon, Tinsley, and Burns (2014) prompted a national sample of individuals to read various violent and natural disaster scenarios. They randomly assigned scenarios in which the disaster was either a near miss with low impact or a direct hit, high-impact disaster. They found that people exposed to the high-impact scenario were more likely to say they intended to increase their preparedness behaviors, compared to people exposed to the low-impact scenario. Furthermore, perceived risk fully mediated the relationship between disaster impact and intention to change preparedness behaviors. In other words, the increased risk perception that accompanies the presence of high-impact disasters accounts for the association between disaster impact and intent to increase preparedness behavior. One important implication of the mixed findings on previous experience, but clearer findings on perceived impact, is that individuals do not have to learn “the hard way.” While experience of a high-impact disaster may increase subsequent preparedness behaviors, so too might knowledge of potential severity and susceptibility. Thus, when applying the EPPM to disaster preparedness, there is utility in theorizing direct and media exposure as threat messages/external stimuli.

College Student Disaster Preparedness

While research on individual preparedness at institutions of higher education is still in an exploratory stage, findings thus far cohere with the EPPM. The bulk of research on individual preparedness at colleges and universities has focused on students, and has found that they are generally underprepared for disasters, lack accurate knowledge of disaster threats, and generally

lack disaster-related self-efficacy. For example, a survey conducted in a hurricane-affected area found that most undergraduate students lacked accurate knowledge of hurricane risks and were underprepared (Simms, Kusenbach, & Tobin, 2013). A qualitative study revealed that undergraduate students generally do not know what to do in the event of a natural disaster, even those disaster-types that occur frequently in their region (Lovekamp & McMahon, 2011). Similarly, students may be underprepared for incidents of mass violence. In a national survey of administrators and security officers (Seo et al., 2012), the majority of participants (75%) reported the perception that students would not know what to do if a school shooting occurred. Thus, there is a growing literature that suggests that college students, overall, do not know what to do in response to natural disasters or incidents of campus violence. Furthermore, these studies again suggest frequent disaster experience on campus does not necessarily contribute to increased preparedness, and that a lack of disaster threat awareness coincided with a lack of preparedness.

Regarding self-efficacy and college student disaster preparedness, research is limited. A survey of students at six institutions of higher education found that they generally believed they were prepared to protect themselves from violence on campus (Burruss et al., 2010). The authors found that most students engaged in preparedness behaviors that were easy to implement (e.g., carrying pepper spray, traveling in groups at night), but rarely did they engage in more in-depth preparedness behaviors (e.g., taking a self-defense class). However, the study lacked an analysis of the relationship between self-efficacy and preparedness behaviors. Like perceived threat, self-efficacy has an unclear relationship with prior experience of disasters. A qualitative study of graduate students in a hurricane-prone area found that most believed they were not prepared to respond to a hurricane (Watson, Loffredo, & McKee, 2011). Qualitative research on undergraduate students at The University of Mississippi revealed that they were generally

underprepared, lacked knowledge of disasters common to the area, and were generally unconcerned about disasters (Davis, 2016). A quantitative survey with undergraduates at the same school (Tkachuck, 2016) found that previous natural disaster experience predicted perceived capacity to respond (i.e., self-efficacy). Furthermore, previous experience and self-efficacy were significant predictors of actual preparedness behaviors (e.g., having emergency supplies). Tkachuck found an association between self-efficacy and concern about disasters occurring, but not between concern and actual preparedness. A similar, follow-up survey on tornado preparedness at the same university found that self-efficacy predicted greater engagement in preparedness actions (White, Stephens, Weber, Tkachuck, & Schulenberg, 2016). These findings are congruent with the EPPM inasmuch as they show that perceived threat predicts perceived self-efficacy, and both predict disaster preparedness, while worry or fear does not predict increased preparedness.

The relationship between previous experience and preparedness could be due to high impact of disasters experienced; just as with disaster preparedness research at large, studies of university students have had mixed results on the association between previous experience and preparedness. Several qualitative studies have already been noted, in which students living in disaster-prone areas were underprepared and/or had low perceived threat (Lovekamp & McMahan, 2011; Simms et al., 2013). Dillon et al. (2014) conducted an experiment with university students that was similar to their previously mentioned experiment comparing low- and high-impact disaster scenarios. The same pattern emerged, in which students who had read about high-impact disasters were more likely to report they intended to change their preparedness behaviors, and this relationship was mediated by perceived risk (i.e., threat). Beyond personal experience, threat messages from media exposure may be related to students'

threat perceptions. For example, New York college students' perceived safety decreased after the Columbine shootings in Colorado (Stretesky & Hogan, 2001). Therefore, direct or media exposure to high-impact disasters may serve as a threat message of high severity and susceptibility, contributing to increased preparedness via perceived threat.

Another factor that consistently predicts students' perceived threat is their perception of faculty and staff efficacy. As previously mentioned, confidence in authority is associated with lower perceived threat of disasters (Wachinger et al., 2012). Consistent with this finding, research on university students has continued to demonstrate the common belief that the university will take care of them, a perspective that contributes to lower levels of perceived threat relating to large-scale emergencies (Burruss et al., 2010; Davis, 2016; Lovekamp & McMahon, 2011). Furthermore, students surveyed after a campus lockdown due to bomb threat in the university library reported that they had expected faculty and staff to know how best to respond to the event, and were upset that faculty and staff did not provide better guidance (Baer et al., 2014). Moreover, in a recent survey of a wide range of disasters and incidents of campus violence, such as tornadoes, earthquakes, terrorist attacks, and an active shooter(s) on campus, 78% of students reported that they were likely to look to their professors (i.e., those individuals teaching their classes) for guidance during these large-scale emergency situations (Tkachuck, 2016). The majority of respondents also reported that they were likely to look for guidance from other faculty (69%), as well as academic staff (72%). Few students (approximately 16%) were likely to look for guidance from other students. These data highlight the critical importance of understanding and enhancing the preparedness of faculty and staff on college campuses. Preparedness of faculty and staff is critical, not only for their own safety, but for the safety of students as well.

Individual Preparedness of Faculty and Staff

Even more so than research on institutional or student preparedness, research on faculty and staff preparedness is lacking. As previously mentioned, Piotrowski and Vodanovich's post-hurricane case study (2008) found qualitative support that clear delegation of faculty's responsibilities and faculty experience leading students during hurricanes were contributing factors to the rapid recovery of the university after it was hit by Hurricane Ivan. However, it is unclear whether this level of preparedness is common at other schools or for other disaster types. A nationally representative survey (Seo et al., 2012) found that college administrators and security officers are generally underprepared for violent disasters. Nearly two-thirds of respondents (60%) indicated that they held emergency drills less than once a year, and less than one out of five (19%) reported that their universities had no emergency drills or plans to hold them. Less than half of the respondents (44%) reported that their institutions trained employees for responding to violent disasters and even fewer (30%) believed employees understood the institution's emergency procedures. Thus, evaluation of the preparedness of individual employees is an important next step in higher education disaster preparedness research.

Unlike college students, faculty and staff often report high perceived disaster threat. One study of allied health college instructors found that they thought that the need for emergency preparedness education was high, but they did not teach emergency preparedness to students (Curtis, 2013). Furthermore, a qualitative survey conducted after a campus lockdown due to a bomb threat indicated that one of the greatest concerns university faculty reported was the safety of others (Piotrowski & Guyette, 2009). This suggests that university leaders are concerned about their own lack of emergency preparedness as well as the well-being of their students. Research on faculty and staff preparedness is clearly lacking, but the available studies suggest

that faculty and staff do perceive threat from disasters, perhaps more so than do students. In conjunction with the aforementioned studies demonstrating that most students look to faculty and staff for guidance during emergencies (Burruss et al., 2010; Davis, 2016; Lovekamp & McMahon, 2011; Tkachuck, 2016), these additional studies further indicate the importance of examining higher education employees' threat perceptions, self-efficacy, and preparedness to protect themselves during disasters, as well as their preparedness to guide students.

Other Predictors of Preparedness

Thus far, the factors considered as predictors of preparedness have been dynamic ones – emergency plans for institutional preparedness, self-efficacy, and perceived threat for individual preparedness. This means that strategies could be implemented to increase disaster preparedness by improving the quality, dissemination, and execution of disaster plans, as well as improving the accuracy of threat perceptions and increasing self-efficacy. However, it is likewise important to consider factors like disaster type and demographic variables, because doing so may reveal (1) confounds to research findings on preparedness, (2) limits to the generalizability of findings, and (3) target populations with minimal levels of disaster preparedness.

Preparedness by Disaster Type. It is essential to examine differences in preparedness for different disaster types, for no two disasters are alike (Dursun, Steger, Bentele, & Schulenberg, 2016). Tornadoes differ from a terrorist attack, for instance, and even disasters of the same type (such as tornadoes) differ when considering predictability, intensity, degree of impact, etc. (Dursun et al., 2016). Few studies have examined more than one disaster type, but one notable exception was a nationally representative survey that found that Americans valued prevention of deaths from terrorism and traffic accidents more than deaths from natural disasters, even when accounting for perceived risk (threat) of each (Viscusi, 2009). In another study, Stein,

Vickio, Fogo, and Abraham (2007) addressed multiple emergency types via a qualitative case study of a Midwestern university's preparedness relating to a hostage situation and for a tornado. They found that departments and agencies asserted a greater need for communication in the case of a tornado as opposed to the hostage situation. Such studies suggest that aspects of preparedness may differ by disaster type and context. Thus, there is a need for new research to enhance our understanding of how preparedness might differ by disaster type.

Demographic Factors. Quantitative studies of disaster preparedness have generally accounted for demographic factors associated with preparedness, and some patterns have emerged. The most consistent finding has been the role of sex as a weak predictor or as a mediator of threat perception and preparedness. Tkachuck's (2016) survey of students at The University of Mississippi found that women perceived disaster threat as higher than men did, but they had also reported experiencing fewer types of disasters than men had. Another survey of undergraduate students (Simms et al., 2013) found a weak association between males and preparedness, although students were fairly homogeneous in their levels of preparedness. A representative survey across 14 U.S. states found women were less likely than men to have disaster supplies in their homes (DeBastiani et al., 2015). A literature review identified two more studies showing that women were less likely to be prepared than men (Kohn et al., 2012). A review of threat perception and preparedness (Wachinger et al., 2012) found that, in some (but not all) studies, sex mediated associations between threat perception, self-efficacy, and preparedness, but did not generally have a main effect on preparedness. Sex differences in preparedness might be because women are less likely than men to be involved in emergency planning processes (Ashraf & Azad, 2015) or because they lack socioeconomic power (Fothergill, 1998). Congruently, Kohn and colleagues (2012) noted that higher socioeconomic

status (SES) has been consistently associated with greater disaster preparedness, even for women or individuals with disabilities. Older age, which also often correlates with higher SES, has been likewise associated with greater preparedness (DeBastiani et al., 2015; Kohn et al., 2012).

Associations between race/ethnicity and preparedness have been mixed. Some studies have found that ethnic minority groups are less prepared before a disaster (DeBastiani et al., 2015; Kohn et al., 2012; Simms et al., 2013), but several studies have also shown that minority groups are more likely than majority groups to increase preparedness after a disaster occurs (Kohn et al., 2012). Therefore, future research should continue to account for demographic variables, especially sex, age and SES, when studying disaster preparedness.

The Next Step for Disaster Preparedness Research

The prevalent research design for disaster preparedness studies has been a retrospective assessment of preparedness and gaps in preparedness soon after a disaster has occurred (e.g., Boscarino et al., 2003; Piotrowski & Vodanovich, 2008; Redlener & Reilly, 2012; Subaya, Moussavi, Velasquez, & Stillman, 2014). Such studies are a useful means of identifying areas in need of improvement, should a similar disaster strike again. However, because they tend to only focus on one salient emergency type, and because they are conducted retrospectively, these studies may not accurately reflect true degrees of preparedness (i.e., retrospective recall may be inaccurate) and the results may not be applicable for different types of emergencies.

Alternatively, some studies have examined general emergency preparedness without differentiating the type of event. For example, a recent study of general disaster preparedness in older U.S. adults identified several factors related to decreased preparedness: increased age, lower education, lower income, and physical disability (Al-Rousan, Rubenstein, & Wallace, 2014). While these findings have important public health implications for the safety of a range of

vulnerable populations, the study did not differentiate preparedness for different disaster types and did not address incidents of mass violence. Thus, it was unclear how preparedness and related variables may differ when considering different emergency types. Therefore, the implication from the available literature is that, beyond assessing preparedness retrospectively after the event, it is imperative to assess preparedness and related factors before a disaster occurs.

The Present Study

Disaster preparedness is a relatively new field of study that has grown rapidly in the wake of the high-impact natural disasters and incidents of mass violence of the late 20th and early 21st centuries. Research on disaster prevalence has found that Mississippi is at increased risk for natural disasters, and educational institutions are at increased risk for incidents of mass violence. Much of the research in this multidisciplinary field has examined the impact of disasters on physical and mental health, but disaster preparedness has emerged as a crucial component of a comprehensive model for disaster management involving preparedness, response, and recovery. Establishment of an all-hazards emergency plan is a common first recommendation for institutional preparedness, providing a standard for an institution's particular benchmarks of what constitutes preparedness at the institutional and individual levels.

Research on individual preparedness is still largely in the exploratory stages, but findings thus far generally cohere with the Extended Parallel Process Model (EPPM). Some studies have found relationships between the main components of the EPPM – perceived threat (susceptibility and severity), self-efficacy, and disaster preparedness (protective behavior). Direct and media exposure to higher-impact disasters and trust in authority may be potential factors contributing to threat perception. Sex, socioeconomic status, and disaster type may also contribute to individual preparedness. More quantitative analysis is needed to examine these factors in relation to

preparedness. Furthermore, because most research on disaster preparedness has been a retrospective analysis of preparedness for a recent disaster, there is a need for disaster preparedness research that examines these factors across disaster types.

Key findings from research on disasters and schools suggest that educational institutions are at increased risk for incidents of mass violence. Students in higher education are generally underprepared, and they tend to trust that faculty will protect them. However, there is a paucity of research on the preparedness of faculty and staff. Thus, an important next step in this line of empirical inquiry is to examine the college environment with specific regard for employees' received threat messages, perceived threat, and self-efficacy as predictors of actual preparedness, across emergency types and with consideration of particular preparedness standards according to institutional emergency plans.

The purpose of the current study was to take this next step by conducting a quantitative study of faculty and staff at The University of Mississippi, taking into account a range of disaster types. Seven natural disasters (tornadoes, hurricanes, earthquakes, severe thunderstorms, ice storms, blizzards or snow storms, and floods) and three forms of mass violence (bomb threats, school shootings, and terrorist attacks) were examined.

Natural disaster hypotheses. A moderated mediation model (Figure 2) was hypothesized for predicting natural disaster preparedness behaviors. The hypothesized model had the following components:

1. Previous experience with natural disasters will predict greater preparedness behaviors.
2. The relationship between natural disasters experienced and preparedness for natural disasters will be mediated by perceived susceptibility of natural disasters.

3. Sex will moderate the relationship between disaster experience and perceived susceptibility, with women reporting higher perceived susceptibility to natural disasters.
4. This mediation will be moderated by impact of previous natural disaster experience, with greater impact predicting greater natural disaster preparedness.
5. This moderation will be moderated by self-efficacy for natural disasters, with greater self-efficacy predicting greater natural disaster preparedness.

Incidents of mass violence hypotheses. The same moderated mediation model was hypothesized for incidents of mass violence:

1. Previous experience with incidents of mass violence will predict greater preparedness behaviors.
2. The relationship between incidents of mass violence experienced and preparedness for incidents of mass violence will be mediated by perceived susceptibility to incidents of mass violence.
3. Sex will moderate the relationship between disaster experience and perceived susceptibility, with women reporting higher perceived susceptibility to incidents of mass violence.
4. This mediation will be moderated by impact of previous experience of incidents of mass violence, with greater impact predicting greater preparedness for incidents of mass violence.
5. This moderation will be moderated by self-efficacy for incidents of mass violence, with greater self-efficacy predicting greater preparedness for incidents of mass violence.

In addition, descriptive results were expected to show some patterns:

1. Engagement in preparedness behaviors will typically be low, with the exception of reading emergency alert messages.
2. Most employees will have experienced natural disasters, but experience with incidents of mass violence will be uncommon. High impact will be uncommon for both.
3. Older employees will have experienced more disasters.
4. Employees will typically be low or moderate in self-efficacy for incidents of mass violence but moderate to high in self-efficacy for natural disasters.
5. Employees will typically be low or moderate in perceived susceptibility for incidents of mass violence but moderate in perceived susceptibility for natural disasters.

While the literature suggests that disaster preparedness may be related to socioeconomic status, this specific relationship was not investigated directly in this study because the socioeconomic status of employees generally corresponds to their university role. Thus, these university role data were also examined. Descriptive results were expected to be similar across university role.

CHAPTER 2

METHOD

Participants

Current employees at The University of Mississippi ($N = 410$) responded to a survey administered university wide to faculty and staff (procedures explained below) in the Spring semester of 2014. The sample consisted of faculty (e.g., full professors, instructors; 33.7%, $n = 138$), academic staff (e.g., deans, research-only positions; 22.4%; $n = 92$), and non-academic staff (e.g., police, physical plant workers, administrative assistants; 43.9%, $n = 180$).

Faculty were reportedly 82.6% White – Non-Hispanic ($n = 114$), 8.0% Asian/Asian American ($n = 11$), 3.9% Hispanic/Latino ($n = 4$), 2.2% Black/African American ($n = 3$), 1.4% multi-racial ($n = 2$), and 2.9% other race or ethnicity ($n = 4$), with none identifying as Native American. Women comprised 57.2% of faculty ($n = 79$) and men comprised 42.8% ($n = 59$). Faculty who reported their age ($n = 71$) ranged in age from 28 to 70 years old ($M_{\text{age}} = 44.9$, $SD_{\text{age}} = 11.0$). They had been employed at the university from <1 to 42 years ($M_{\text{years}} = 8.5$, $SD_{\text{years}} = 7.8$).

Academic staff were reportedly 83.7% White – Non-Hispanic ($n = 77$), 8.7% Black/African American ($n = 8$), 3.3% other race or ethnicity ($n = 3$), 2.2% Native American Indian ($n = 2$), 1.1% Asian/Asian American ($n = 1$), and 1.1% multi-racial ($n = 1$), with none identifying as Hispanic/Latino. Women comprised 47.8% of academic staff ($n = 44$) and men comprised 52.2% ($n = 48$). Academic staff ranged in age from 21 to 66 years old ($M_{\text{age}} = 41.3$,

$SD_{\text{age}} = 11.3$). They had been employed at the university from <1 to 37 years ($M_{\text{years}} = 10.3$, $SD_{\text{years}} = 9.3$).

Non-academic staff were reportedly 84.9% White – Non-Hispanic ($n = 152$), 8.9% Black/African American ($n = 16$), 1.7% Asian/Asian American ($n = 3$), 1.7% Hispanic/Latino ($n = 3$), 1.7% multi-racial ($n = 3$), and 1.1% other race or ethnicity ($n = 2$), with none identifying as Native American. Women comprised 78.9% of non-academic staff ($n = 142$) and men comprised 21.1% ($n = 38$). Non-academic staff who reported their age ($n = 73$) ranged in age from 21 to 64 years old ($M_{\text{age}} = 41.8$, $SD_{\text{age}} = 12.6$). They had been employed at the university from <1 to 40 years ($M_{\text{years}} = 8.5$, $SD_{\text{years}} = 8.1$).

Overall, the sample was reportedly 83.9% White – Non-Hispanic ($n = 343$), 6.6% Black/African American ($n = 27$), 3.7% Asian/Asian American ($n = 15$), 1.7% Hispanic/Latino ($n = 7$), 1.5% multi-racial ($n = 6$), 0.5% Native American Indian ($n = 2$), and 2.2% other race or ethnicity ($n = 9$). Women comprised 64.6% of the sample ($n = 265$) and men comprised 35.4% ($n = 145$). University employees who reported their age ($n = 193$) ranged in age from 21 to 70 years old ($M_{\text{age}} = 42.8$, $SD_{\text{age}} = 11.7$). They had been employed at the university from <1 to 42 years ($M_{\text{years}} = 8.9$, $SD_{\text{years}} = 8.3$).

Measure Development

The survey was developed as the culmination of a series of steps. The first step involved a pilot study and a quantitative analysis of survey data with a sample of psychology undergraduate students at The University of Mississippi (Baczowski et al., 2013). The second step involved focus group participants of undergraduate students and their thoughts regarding the pilot survey questionnaire (Davis, 2016). The third step involved the administration of the survey campus-wide to university students (Tkachuck, 2016). The subsequent survey was adapted for

use with faculty and staff in the present study.

Step 1: Quantitative pilot survey. The first step of the survey development involved a pilot study (Baczowski et al., 2013). Previous qualitative studies had employed open-ended questions to assess previous experience, perceived threat, fear, and perceived preparedness of college students (Lovekamp & McMahon, 2011). Because few quantitative studies have been conducted on university disaster preparedness and no quantitative measures existed for this topic, closed-ended questions were developed for the pilot study to assess previous emergency experience and perceived likelihood, worry about emergencies, and emergency preparedness. To assess previous emergency experience, the question was, “Which of the following emergency situations have you personally experienced? Check all that apply.” Response options were Hurricane, Earthquake, Tornado, Flood, Fire, Disease Outbreak, Terrorist Attack, Blizzard/Ice Storm, Mass Shooting, Bomb Threat, Other (with a text box to indicate emergency type), and None of the above. Perceived likelihood was assessed with the question, “How likely do you think the following different emergency situations are to happen at Ole Miss [The University of Mississippi] in the next two years?” The question was asked for 10 emergency types: Hurricane, Earthquake, Tornado, Flood, Fire, Disease Outbreak, Terrorist Attack, Blizzard/Ice Storm, Mass Shooting, and Bomb Threat. Responses were collected via a 7-point Likert-type scale that ranged from “1 – not at all likely” to “7 – extremely likely.” Worry about emergencies was assessed with the question, “How worried are you about each of the following situations occurring at Ole Miss in the next two years?” The question was asked for the same 10 aforementioned emergency types. Responses were collected via a 7-point Likert-type scale that ranged from “1 – not at all worried” to “7 – extremely worried.” Perceived preparedness was assessed with the question, “How sure are you that you know what to do if the following situations arose at Ole Miss?” The

question was asked for the same 10 aforementioned emergency types. Responses were collected via a 7-point Likert-type scale that ranged from “1 – I have no idea what to do” to “7 – I have a very good idea what to do.” Additional questions were asked to assess how confident they were in the university’s preparedness for campus violence, disease outbreak, and natural disasters; disaster preparedness as their personal responsibility versus the university’s responsibility; and faculty and staff they would look to for guidance. They were asked about disaster supplies they keep in their residence and how they receive emergency warning information.

The pilot study included the Three Item Worry Index (TIWI; Kelly, 2004), which was moderately correlated to worry about emergencies occurring in the next two years ($r_s = .20$ to $.45$, $p < .01$). For seven emergency types, scores on the TIWI were modestly correlated with perceived likelihood of emergencies occurring in the next two years ($r_s = .14$ to $.28$, $p < .05$). In the pilot study, the Intolerance for Uncertainty Scale (IUS; Buhr & Dugas, 2002) was modestly correlated with worry about seven emergency types ($r_s = .15$ to $.29$, $p < .05$) and modestly correlated with perceived likelihood of seven emergency types ($r_s = .16$ to $.30$, $p < .05$).

Step 2: Qualitative focus groups. Focus group discussions were then conducted in which college students provided qualitative feedback on the pilot study questions and on how the survey could be improved (Davis, 2016). This feedback included comments from eight students that people who worry about emergency preparedness are perceived as paranoid. These comments informed a change to the question, “How worried are you about each of the following situations occurring at Ole Miss in the next two years?” In order to reduce the negative connotation of preparedness, the word “worried” was replaced with “concerned.”

Two other types of focus groups were also conducted on emergency knowledge, preparedness, and experience—one focusing on natural disasters, and the other on incidents of

mass violence and disease pandemic (Davis, 2016). Employing the Constant Comparative Method for qualitative analysis (Glaser, 1965; Vander Putten & Nolen, 2010), seven themes emerged from the focus groups on natural disasters and incidents of mass violence/pandemics: (1) perceptions about one's emergency preparedness, (2) likelihood of occurrence of emergencies, (3) reasons people are or are not prepared, (4) ways students can prepare for disasters, (5) the university's role in preparing students, (6) emergency response training, and (7) improving awareness of ways to prepare for emergencies.

Step 3: Quantitative college student survey. Building off the pilot survey and qualitative findings, an expanded quantitative survey was conducted with 806 undergraduate and graduate students (Tkachuck, 2016). The questions in the pilot study remained essentially the same, with the following changes. As noted above, wording was changed from “worried” to “concerned” based on focus group comments. The wording for questions about perceptions of disasters was also changed to ask about the *next year*, rather than the next *two* years.

Step 4: The present survey on employee preparedness. Most questions from the student survey were retained verbatim in the employee survey (Appendix A). Demographic questions on education (e.g., major, residence on- or off-campus) were removed and those relating to type of employment were added. Questions about supplies focused on the items employees had access to on campus (e.g., weather radio, first aid kit), rather than in their dorms/apartments/homes. The question on looking for guidance was retained, but a question on comfort with respect to guiding students was added as well. Questions about university role (faculty, academic staff, or non-academic staff) and job title were added to address socioeconomic status.

Measures

The measures described below comprised the bulk of the survey (Appendix A). It also included additional questions not addressed in this study, related to the effectiveness of campus emergency alert systems and views on the institution's preparedness.

Disaster-related experience. Experience was defined as having been directly affected by a particular emergency at least once in one's lifetime. Experience was measured by response to the question, "Which of the following emergency situations have you personally experienced (i.e., you were directly affected by the experience)?" Response options included seven types of natural disasters (tornado, hurricane, earthquake, severe thunderstorm, ice storm, blizzard/snow storm, and flood) and three types of mass violence (bomb threat, school shooting, terrorist attack). Disease pandemic (not part of the current study), "other," and "none" were also response options. Responses were either "yes" (coded 1) or "no" (coded 0) and coded 0 for "yes" responses to "none of the above." Endorsing one emergency type did not preclude endorsing another. The seven natural disaster responses were summed for an overall natural disaster experience score, with the same approach taken for the three incidents of mass violence. "Other" responses were re-coded as natural disasters or incidents of mass violence, if appropriate, and added to their respective sum scores.

Impact of disaster-related experience. Impact of natural disaster experience was assessed as a follow-up if responses indicated at least one natural disaster had been experienced, and likewise for incidents of mass violence. Impact of experience was defined as experience of trauma, hardship, or potential stress as a result of a disaster. Impact of natural disaster experience was measured with the question, "Which of the following have you experienced as a result of a weather-related emergency situation?" Impact of experience with incidents of mass violence was measured with the same question, replacing the word "weather" with "violence." Response

options for both questions were “Saw others injured or killed,” “Got injured yourself,” “Felt a direct threat to your life,” “Provided first aid,” “Lost a significant amount of material possessions,” “Could not get in touch with other family members,” “Were separated from members of your immediate family,” “Could not get to a store for three or more days,” “Lost electricity for three or more days,” “Were forced to leave your community or neighborhood due to an evacuation order,” “Had to leave home for three or more days,” “Had to leave work/school,” or “None of the above.” Responses were either “yes” (coded 1) or “no” (coded 0), and scored 0 for “yes” responses to “none of the above.” Endorsing one outcome did not preclude endorsing another. Natural disaster responses were summed for an overall natural disaster impact score, with the same approach taken for incidents of mass violence. Sum scores over 6 (or over half the impact items endorsed) were interpreted as high impact.

Perceived susceptibility (to threat). Perceived susceptibility was defined as the extent to which an individual expects a particular emergency to affect their location in the next year. Perceived susceptibility was measured by the response to the question, “How likely is it that each of the following situations will occur at Ole Miss in the next year?” Emergency types included tornado, hurricane, earthquake, severe thunderstorm, ice storm, blizzard/snow storm, flood, bomb threat, school shooting, and terrorist attack. Responses were collected via a 7-point Likert-type scale, which ranged from “1 - not at all likely” to “7 - extremely likely.” Overall, natural disaster perceived susceptibility was computed as a mean score, with higher scores indicating higher perceived threat. Mean scores 3 or lower were considered low, mean scores greater than 3 but less than 5 were considered moderate, and mean scores of 5 or higher were considered high.

Self-efficacy. Self-efficacy was defined as the extent to which individuals are confident in their ability to protect themselves or others from a disaster. Two questions assessed self-

efficacy. The first was, “How sure are you that you know what to do if the following situations were to occur at Ole Miss?” Emergency types included tornado, hurricane, earthquake, severe thunderstorm, ice storm, blizzard/snow storm, flood, bomb threat, school shooting, and terrorist attack. Responses were collected via a 7-point Likert-type scale ranging from “1 - I have no idea what to do” to “7 - I have a very good idea what to do.” The second question was, “For each of the following events, how comfortable do you think you would be in providing guidance to students (directing students to safety, for example)?” Emergency types included tornado, hurricane, earthquake, severe thunderstorm, ice storm, blizzard/snow storm, flood, bomb threat, school shooting, and terrorist attack. Responses were collected via a Likert-type scale ranging from “1 - not comfortable” to “7 - very comfortable.” Overall, the natural disaster self-efficacy score was computed as the mean of responses to both questions regarding natural disasters, and likewise for incidents of mass violence. Mean scores 3 or lower were considered low, mean scores greater than 3 but less than 5 were considered moderate, and mean scores of 5 or higher were considered high.

Actual preparedness. Actual preparedness behaviors were defined as actions university employees could take to better prepare themselves for emergencies. Six preparedness behaviors were included: (1) frequency of reading a daily mass email with University news, (2) frequency of reading university mass text and email emergency alerts, (3) access to a weather radio, (4) access to a first aid kit, (5) watching an educational video on how to respond to an on-campus shooter, and (6) reading educational posters on how to respond to disasters on campus. Scale scores were computed for natural disasters as a sum score of items 1, 2, 3, 4, and 6, and for incidents of mass violence as a sum score of items 1, 2, 4, and 5. Higher scores indicate greater preparedness.

Frequency of reading email alerts was measured with the question, “About how many of the UM Today messages do you read?” Frequency of reading text message alerts was measured with the question, “About how many of the RebAlert text messages do you read?” Response options for both questions were coded 1 for “all of them,” “more than half, but not all,” “about half,” and “some of them, less than half.” The responses “none of them” and “I do not receive [UM Today or RebAlert] messages” were coded 0.

Weather radio access was measured with the question, “While on campus, do you have access to a weather radio (e.g., battery-operated or hand cranked)?” First aid kit access was measured with the question, “While on campus, do you have access to a first aid kit?” Watching the active shooter video was measured with the question, “Are you aware that the University has created a video designed to prepare faculty, staff, and students on how to respond during a shooting on campus?” and the follow-up question, “Have you seen this video?” Reading the weather and disease-related signs was measured with the question, “Are you aware that the University posts informational signs in buildings to prepare faculty, staff, and students for emergency situations, such as tornadoes and the flu epidemic?” and the follow-up question, “Have you read one of these signs?” Response options for all weather radio, first aid kit, active shooter video, and weather and disease-related sign questions were “yes” (coded 1) and “no” (coded 0).

Procedure

Participants were recruited via an email sent to employees of The University of Mississippi, which included a link to a 5- to 10-minute online survey created with Qualtrics software. All survey data were collected in January and February, 2014. Informed consent was delivered on the initial screen prior to administration of the survey (Appendix A). The

Institutional Review Board of The University of Mississippi granted approval for this study, as did the university's Incident Response Team (IRT).

Data Analysis

Statistical analyses were conducted using SPSS and the SPSS add-on PROCESS. First, descriptive statistics were computed for all variables: university role, experience for each emergency type, impact of experience items and sum scores, perceived susceptibility by item and mean scores, self-efficacy by item and mean scores, and actual preparedness by item. Descriptive statistics were also computed by university role for each of the other aforementioned variables. Along with descriptive statistics, a bivariate correlation of age and total disaster experience (natural disasters and incidents of mass violence combined) was conducted.

Sum and mean scores were computed as described under "Measures." Cronbach's alphas were computed for Perceived Susceptibility mean scores and Self-Efficacy mean scores. Prior to conditional process analysis, 1 point was added to all sum score variables so they would not include zero values when mean-centered. Variables with skewness $> |1|$ were logarithmically (\log_{10}) transformed.

Hypothesis testing was conducted using Model 37 for the PROCESS add-on to SPSS (Hayes, 2013a; Figure 2). This model tests the direct effect of variable X on Y , the indirect effect of M on Y , the effect of W as a moderator of the relationship between X and M , the effect of V as a moderator of the relationship between M and Y , and the effect of Q as a moderator of the V 's moderation. Figure 2 demonstrates these relationships pictorially with the relevant variables identified based on the current study. The analysis was set to automatically mean center variables. For the natural disasters analysis, the outcome variable (Y) entered was the sum score for natural disaster preparedness behaviors. The main independent variable (X) was the previous

natural disaster experience sum score. The mediating variable (M_i) was the mean score for perceived natural disaster susceptibility. The variable moderating the effect of the main independent variable on the mediator (W) was sex. The variable moderating the mediation (V) was the sum score of previous natural disaster impact. The variable moderating the moderation (Q) was the mean score for natural disaster self-efficacy. The same analysis was conducted with the analogous variables for incidents of mass violence. Additionally, Model 18 was explored (Figure 3). The only difference between this model and Model 37 is that, for Model 18, sex was entered as a covariate instead of as a moderator of X and M .

It was proposed that a model comparison would be conducted, should both models be statistically significant. Because the two models were not nested, Akaike's Information Criterion (AIC; Akaike, 2011; Bozdogan, 1987) was identified as an appropriate test for model comparison. Furthermore, the AIC outperforms Bayes' Information Criterion when the "true" model is complex (Vrieze, 2012), as is the case for modeling a cluster of disaster preparedness behaviors. AIC compares models by providing estimates of the information lost in the model. AIC includes both a measure of goodness-of-fit and a penalty for number of parameters included in the model.

No power analysis was conducted for this study because moderated mediation is a newly developed statistical procedure that, at this time, lacks a well-developed effect size test or best method for power analysis (Hayes, 2013b). Furthermore, the present sample size of 410 is larger than 80% of samples used for mediation analysis (Fritz & MacKinnon, 2007).

CHAPTER 3

RESULTS

Data Cleaning

Data cleaning involved recoding all “other” responses to university role as faculty, academic staff, or non-academic staff, based on job title. Nineteen “other” responses revealed students or non-employees, so these data were dropped from subsequent analyses. After recoding, faculty comprised 33.7% of the sample ($n = 138$), academic staff comprised 22.4% of the sample ($n = 92$), and non-academic staff comprised 43.9% of the sample ($n = 180$). “Other” responses to disasters experienced were recoded as (1) other incident of mass violence or (2) other natural disaster. Other examples of violence reported included riots, protests that became violent, and shootings at non-school locations. These data were included in violence experience sum scores. No other examples of natural disasters were reported. Other open-ended responses included vehicle accidents, personal medical emergencies, working in emergency medical services, and military service; none of these responses were included in the disaster experience sum score, with respect to incidents of mass violence and natural disasters.

Sum and Mean Scores

Sum scores and mean scores were computed, with cases dropped for mean scores if two or more item scores were missing. For this reason, two cases were dropped from the Perceived Susceptibility – Natural Disasters mean scores, two cases were dropped from the Perceived Susceptibility – Mass Violence mean scores, six cases were dropped from the Self-Efficacy –

Natural Disasters mean scores, and seven cases were dropped from the Self-Efficacy – Mass Violence – mean scores. Cases with only one missing data point were retained, which included 10 cases for Perceived Susceptibility – Natural Disasters, one case for Perceived Susceptibility – Mass Violence, 14 cases for Self-Efficacy – Natural Disasters, and eight cases for Self-Efficacy – Mass Violence.

For the conditional process analysis, zero values were avoided by adding 1 to the sum scores of Natural Disaster Experience, Natural Disaster Impact, Natural Disaster Preparedness Behaviors, Violence Preparedness Behaviors, and Sex. For Violence Experience and Violence Impact, transformed scores were used (see “skewness” below).

Reliability

Cronbach’s alpha was computed for all mean scores. Based on DeVellis’ standards for scale reliability (2012), internal consistency was respectable for Perceived Susceptibility – Natural Disasters ($\alpha = .78, N = 397$), very good for Perceived Susceptibility – Mass Violence ($\alpha = .87, N = 407$), excellent for Self-Efficacy – Natural Disasters ($\alpha = .93, N = 387$), and excellent for Self-Efficacy – Mass Violence ($\alpha = .92, N = 395$).

Descriptive Statistics

Descriptive statistics were computed by item for the overall sample and by university role with respect to experience with various kinds of disaster (Table 1), type and severity of the impact of natural disasters (Table 2), type and severity of the impact of incidents of mass violence (Table 3), perceived susceptibility to various kinds of disaster (Table 4), personal self-efficacy by disaster type (Table 5), self-efficacy in terms of guiding students by disaster type (Table 6), and frequency of various preparedness behaviors (Table 7). Descriptive results were generally homogeneous across university role, which was included as an indirect measure of

socioeconomic status.

As noted in Table 1, nearly all faculty and staff had experienced a natural disaster (95.1%), and less than a quarter had experienced an incident of mass violence (22.2%), primarily involving bomb threats (19.5%). Across university role, severe thunderstorms was the disaster most commonly experienced, followed by ice storms. For faculty, the third most commonly experienced disaster type was blizzards/snow storms, with the fourth being tornadoes. For both academic and non-academic staff, tornadoes were the third most commonly experienced disaster type, with blizzards/snow storms being the fourth. Across university role, bomb threat experience was the most common among the incidents of mass violence.

Faculty and staff who had experienced natural disasters and incidents of mass violence reported a wide range of ways they were impacted (Tables 2 and 3). Regarding the most common forms of impact, over half of faculty and staff had lost electricity for three or more days (68.5%), or had to miss work/school for three or more days (52.9%), due to a natural disaster (Table 2). Regarding more severe forms of impact, about forty percent (39.3%) of employees had felt a direct threat to their lives and about fifteen percent (14.6%) had seen someone injured or killed in the course of a natural disaster. Overall, impact due to incidents of mass violence was substantially lower than those reported for natural disasters (Table 3). Almost three percent (2.7%) of employees reported they had felt a direct threat to their lives due to an incident of mass violence, and almost three percent (2.7%) said they could not get in touch with family members due to an incident of mass violence.

For the overall sample, perceived susceptibility for natural disasters ranged from a low of $M_{Hurricane} = 2.03$ to a high of $M_{Thunderstorm} = 6.14$ (Table 4). Perceived susceptibility for incidents of mass violence was generally low to moderate, and low compared to natural disasters, ranging

from a low of $M_{Terrorist\ Attack} = 2.39$ to a high of $M_{School\ Shooting} = 3.31$ (Table 4). Across university role, perceived susceptibility was similar for most disaster types, with mean ratings no more than one point apart for faculty, academic staff, and non-academic staff. The exceptions were perceived susceptibility ratings for blizzards/snow storms and ice storms. For blizzards/snow storms, the mean perceived susceptibility was lowest for faculty ($M = 2.72$, $SD = 1.56$) and highest for academic staff ($M = 4.12$, $SD = 1.42$). For ice storms, the mean perceived susceptibility was lowest for academic staff ($M = 2.90$, $SD = 1.46$) and highest for non-academic staff ($M = 4.34$, $SD = 1.50$).

Personal self-efficacy for natural disasters was generally moderate to high, ranging from a low of $M_{Earthquake} = 4.35$ to a high of $M_{Thunderstorm} = 6.14$ (Table 5). Self-efficacy for incidents of mass violence was generally moderate, ranging from a low of $M_{Terrorist\ Attack} = 3.48$ to a high of $M_{School\ Shooting} = 4.28$ (Table 5). Across university role, personal self-efficacy was similar for all disaster types, with mean ratings no more than one point apart for faculty, academic staff, and non-academic staff. Self-efficacy guiding students during natural disasters was generally moderate to high, ranging from a low of $M_{Earthquake} = 4.32$ to a high of $M_{Thunderstorm} = 5.73$ (Table 6). Self-efficacy for incidents of mass violence was generally moderate, ranging from a low of $M_{Terrorist\ Attack} = 3.47$ to a high of $M_{School\ Shooting} = 3.87$ (Table 6). Across university role, personal self-efficacy was similar for all disaster types, with mean ratings no more than one point apart for faculty, academic staff, and non-academic staff.

With regard to frequency of preparedness behaviors (Table 7), nearly all faculty and staff reported reading daily mass emails (92.5%) and emergency alert text messages (88.8%). Similarly, most faculty and staff reported reading informational posters on campus (77.1%). Overall, few employees reported having access to weather radios (23.2%), with faculty being

least likely (14.6%) in comparison to academic and non-academic staff (27.5% for each group). About three quarters of academic staff reported having access to a first aid kit on campus (74.7%), but only about half of faculty did (53.6%). Over one third (35.8%) of non-academic staff had seen the video on active shooter responding, but less than one sixth (14.1%) of faculty reported having seen it.

Age and Experience

A bivariate correlation was calculated between age and number of disasters experienced (natural disasters and incidents of mass violence, combined). Using Cohen's general standards for interpreting correlations (1988, as cited in Meyers, Gamst, & Guarino, 2006), older age was moderately, but significantly, correlated with a higher number of disaster types experienced, $r(191) = .181, p = .012$. Moving beyond this initial analysis, bivariate correlations were calculated between age and number of natural disaster types experienced, then between age and number of mass violence types experienced. As with all disaster types combined, older age was moderately, but significantly correlated with number of natural disaster types experienced ($r(193) = .210, p = .003$). However, age and number of mass violence types experienced were not significantly correlated ($r(193) = .002, p = .976$).

Checking Assumptions

Skewness was computed for experience, impact, perceived susceptibility, self-efficacy, and preparedness behaviors considering both natural disasters and incidents of mass violence. Skewness $> |2|$ was considered substantial, based on Kim's guidelines (2013) for samples larger than 300. Two distributions were substantially skewed: experience of incidents of mass violence (skewness = 2.13, $SE = .121$) and impact of incidents of mass violence (skewness = 7.99, $SE = .121$). As suggested by Tabachnick and Fidell (2007) and Howell (2007), the distributions of

both substantially skewed distributions were logarithmically (Log 10) transformed. To avoid zero values, 1 was added to both variables prior to transformation. After the transformation, skewness was still substantial for impact of incidents of mass violence (5.13). For experience of incidents of mass violence, skewness was moderate (1.62). Transformed scores for experience and impact of incidents of mass violence were used for all subsequent statistical analyses.

A linear regression was conducted to check ordinary least squares regression assumptions (Hayes, 2013b; Howell, 2007). All five independent variables (Disaster Experience, Sex, Perceived Susceptibility, Disaster Impact, and Self-Efficacy) were entered together, in separate tests for natural disasters and incidents of mass violence. Based on scatterplots of the regression standardized residuals, assumptions of linearity were met. To check for multicollinearity, bivariate correlations were calculated for all five predictors; none were highly correlated (all $r_{Natural\ Disasters}$ correlations $< .50$, all $r_{Mass\ Violence}$ correlations $< .40$). Furthermore, all variance inflation factors were low, ranging from 1.025 to 1.408. Based on the spread of standardized residuals for both natural disasters and incidents of mass violence, homogeneity and homoscedasticity assumptions were met.

Conditional Process Analysis

Moderated, moderated mediation analyses were conducted using ordinary least squares path analysis. In order to provide more interpretable coefficients, automatic mean centering was employed (Hayes, 2013b). Because the directions of all effects were hypothesized, confidence intervals were set to 90% (Hayes, 2013b). In order to incorporate sex as a moderator of effect of disaster experience on perceived susceptibility, Model 37 (Figure 2) was computed as the primary model for both natural disasters and incidents of mass violence.

For natural disasters (Table 8), a greater variety of disasters experienced predicted higher

perceived susceptibility to natural disasters ($a1_i = .0939, p < .001$). Sex also had a direct effect on perceived susceptibility ($a2_i = -.2258, p = .010$), with women reporting higher perceived susceptibility to natural disasters than men. However, the indirect effect of experience by sex was not statistically significant ($p = .100$), meaning that sex did not significantly moderate the effect of experience on perceived susceptibility. The direct effect of experience on preparedness behavior was not statistically significant ($p = .134$). Furthermore, a bias-corrected bootstrap confidence interval for the indirect effect of experience on preparedness behaviors through perceived susceptibility, based on 1000 samples, was not entirely above zero. Thus, experience did not appear to have a direct effect on preparedness behavior, nor did perceived susceptibility mediate this effect. However, there was a significant direct effect of disaster impact on preparedness behaviors ($b_2 = .0379, p = .045$), with higher impact predicting greater preparedness behavior. Similarly, self-efficacy had a significant direct effect on preparedness behavior ($b_3 = .2426, p < .001$), with higher self-efficacy predicting greater preparedness behavior. Beyond the simple effects of self-efficacy and disaster impact on preparedness behavior, there was an interaction effect between self-efficacy and disaster impact ($b_6 = .0349, p = .015$). In other words, self-efficacy moderated the effect of disaster experience on preparedness behavior.

With incidents of mass violence (Table 9), a greater variety of incidents of mass violence experienced predicted higher perceived susceptibility to incidents of mass violence ($a1_i = .9628, p = .020$). Sex also had a direct effect on perceived susceptibility ($a2_i = -.2551, p = .034$), with women reporting higher perceived susceptibility to incidents of mass violence than men. However, the indirect effect of experience by sex was not statistically significant ($p = .053$), meaning that women did not report significantly higher perceived susceptibility than men with

similar disaster experience. The direct effect of experience on preparedness behavior was not statistically significant ($p = .254$). However, higher perceived susceptibility predicted greater preparedness behavior ($b_{1i} = .0742, p = .009$). A bias-corrected bootstrap confidence interval for the indirect effect of experience on preparedness behavior through perceived susceptibility, based on 1000 samples, was not entirely above zero for all levels of the moderators, meaning that perceived susceptibility did not mediate the effect of experience on preparedness behavior across all conditions. However, bias-corrected bootstrap confidence intervals were above zero under all conditions in which females reported moderate to high self-efficacy. In other words, perceived susceptibility mediated the relationship between experience and preparedness behavior, which was moderated by sex and self-efficacy. Additionally, self-efficacy had a direct effect on preparedness behavior ($b_3 = .1500, p < .001$).

Model 18 was also examined (Tables 10 and 11). With this model, sex was entered as a covariate, rather than as a moderator. For natural disasters, the same effects were statistically significant as with Model 37 (Table 10). Specifically, disaster experience and sex had significant direct effects on perceived susceptibility, but perceived susceptibility did not have a significant effect on preparedness behavior. Disaster impact and self-efficacy both had direct effects on preparedness behavior and self-efficacy moderated the effect of disaster impact on preparedness behavior. With incidents of mass violence, the model predicting effects on the mediator (perceived susceptibility) was not statistically significant, $R^2 = .0146, F(2, 398) = 2.946, p = .0537$ (Table 11). Perceived susceptibility mediated the effect of mass violence experience on preparedness behaviors, when self-efficacy was neutral or high (i.e., bias-corrected bootstrap confidence intervals, based on 1000 samples, were entirely above zero for these conditions).

Model Comparison

Regarding the comparison of models 18 and 37 for natural disasters Model 37 was the hypothesized model and it outperformed Model 18 for incidents of mass violence, because Model 18 did not significantly predict perceived susceptibility for incidents of mass violence and because sex was not accounted for in the mediation. However, because both models were similarly significant regarding natural disasters, a model comparison was conducted for these two. First, the residual sum of squares (RSS) was calculated for the model predicting perceived susceptibility (the mediator, M_i), then calculated for the model predicting preparedness behavior (the main dependent variable, Y). This was done for both Model 37, where sex was entered as a moderator of perceived susceptibility, and for Model 18, where sex was entered as a covariate. Using the mean square errors (MSE's) computed for the conditional process analyses,

$$RSS = \frac{MSS}{df_{Residual}} = \frac{MSS}{(N-k)}$$

where k is the number of parameters in the model, including the

intercept (Hayes, 2013b). The formula for AIC that is used with ordinary least squares

regression-based models is $AIC = N \times \ln \frac{RSS}{N} + 2k$. AIC's were computed using the

QuickCalcs software by GraphPad Software, Inc.

For the models predicting perceived susceptibility, Model 18 was 1.2 times more likely to be correct, compared to Model 37 (Table 12). However, for the models predicting preparedness behavior, Model 37 was 2.7 times more likely to be correct, compared to Model 18 (Table 12).

CHAPTER 4

DISCUSSION

The purpose of this study was to build on exploratory disaster preparedness research by testing a model grounded in health behavior theory, and to fill a gap in the literature by examining employees of higher education institutions. Specifically, employees' sex, received threat messages, perceived threat, and self-efficacy were examined as predictors of actual preparedness, across a range of natural disasters and incidents of mass violence. Seven natural disasters (tornadoes, hurricanes, earthquakes, severe thunderstorms, ice storms, blizzards/snow storms, and floods) and three forms of mass violence (bomb threats, school shootings, and terrorist attacks) were examined. Drawing from the Extended Parallel Process Model (EPPM), which has been applied to other health-seeking behaviors (Popova, 2012), a moderated mediation model was hypothesized (Figure 2). The hypothesized model was partially supported. For natural disasters, experience and sex had direct effects on perceived susceptibility, but perceived susceptibility did not mediate the effect of disaster experience on preparedness behavior, nor did disaster experience have a significant direct effect. However, both self-efficacy and disaster impact had direct effects on preparedness behavior, and self-efficacy further moderated the effect of disaster impact. For incidents of mass violence, perceived susceptibility mediated the effect of experience on preparedness behavior, when self-efficacy was high and employees were female. Self-efficacy also had a direct effect on preparedness behavior.

Descriptive Patterns

The descriptive results of the study generally supported the descriptive hypotheses, with one exception – faculty and staff were more frequently engaged in preparedness behaviors than the current study hypothesized. Few faculty and staff had access to weather radios on campus and few had seen the video on responding to an active shooter. However, not only did most employees (more than four out of five) read emergency alert text messages, but nearly all read the daily mass emails, most had access to first aid kits on campus, and most had read informational posters about disasters. More so than faculty, staff had first aid kits, access to weather radios, and had watched the active shooter response video. The hypothesis that preparedness behavior would generally be low was based on previous studies' findings of low rates of various preparedness behaviors in college administrators (Seo et al., 2012) and college instructors (Curtis, 2013). Furthermore, this hypothesis was guided by Tkachuck's study (2016) of university students, which found low rates of preparedness for the same behaviors, and high rates for reading emergency alert messages. Likewise, Burruss et al. (2010) found students engaged in high rates of minimal-effort preparedness behaviors, but low rates of in-depth preparedness behaviors. However, the specific preparedness behaviors examined by Curtis (e.g., teaching students the emergency response plan in class) and by Seo et al. (e.g., participating in emergency drills once a year) were more advanced than those examined in the current study. Thus, the high rates of preparedness behaviors reported in the present study suggest that employees engage in low-level preparedness (e.g., reading emergency alert messages, reading posters), even if employees are not engaging in more time-consuming, in-depth preparedness behaviors (e.g., obtaining first aid kits, watching a video). It is promising that faculty and staff had generally engaged in the most basic preparedness behaviors, so the next goal is to facilitate

engagement in more effortful preparedness strategies, including making use of resources like the active shooter response video and obtaining weather radios or locating those in their buildings.

As hypothesized, natural disaster experience was common (nearly all employees had experienced at least one), but experience with incidents of mass violence was uncommon. Less than a quarter of the sample had experienced an event, with experience primarily with bomb threat, as opposed to school shootings or terrorist attacks. Natural disaster experience was highest for disasters frequent in the state and region (thunderstorms, tornadoes, and hurricanes). Experience of blizzards/snow storms and ice storms was also common, more so for faculty and staff. Ice or snow storms regularly occur at the university every few years. Still, one explanation for the higher rates of experience among faculty might be that faculty may have moved from northern regions of the U.S. where snow and ice are more common, whereas staff might be more local to the southeast. Overall, nearly all faculty and staff reported low impact from the disasters they had experienced, but there was a wide range of impacts experienced. Regarding natural disasters, many forms of impact were reported, including high rates of perceived life threat, losing electricity, missing work or school, and being unable to get to a store (Table 2). Furthermore, the majority of employees had been impacted in at least one way (Table 2). As for incidents of mass violence, experiences were uncommon, but when experienced, one in 10 felt their lives were threatened and one in 10 could not contact their families (Table 3). This hypothesis of overall low impact was based on high regional prevalence rates of natural disasters, particularly tornadoes (Ashley, 2007; Boruff et al., 2003; Sherman-Morris et al., 2012) and floods (Sherman-Morris et al., 2012) and on low national rates of incidents of mass violence (Follman et al., 2016) compared to rates of natural disasters (National Weather Service, 2016). Thus, disaster experiences of faculty and staff were congruent with disaster prevalence rates in

the area (high rates of regionally and nationally-prevalent natural disasters, but low rates of mass violence experience).

The third hypothesis was that older employees would have experienced more disasters, and this was supported by a moderate, significant, positive correlation between age and number of disaster types experienced. This was based on the logic that the longer people live, the more likely they are to experience one or more disasters. A moderate correlation between age and natural disaster experience suggests that this is especially the case for natural disasters, which are more frequently experienced than incidents of mass violence. The lack of a correlation between incidents of mass violence and age could be because rates of experience were so low. Due to missing data, age was not included in further analyses for the current study, but considering the significant correlations and the aforementioned logic, future research should include age when examining disaster experience, particularly with regard for natural disasters.

Likewise, results supported the fourth hypothesis. Both mean personal self-efficacy and mean self-efficacy guiding students were low for incidents of mass violence (Table 6). With natural disasters, personal self-efficacy was moderate to high and self-efficacy guiding students was moderate. Comparatively speaking, employees are reportedly somewhat confident in responding to and guiding students during natural disasters, but report lower levels of confidence in doing so for incidents of mass violence. Because previous research regarding faculty and staff disaster-related self-efficacy was extremely limited, this hypothesis was based on previous studies that found an association between self-efficacy and disaster experience amongst students at the same university as the present study (Tkachuck, 2016; White et al., 2016).

Lastly, it was hypothesized that employees would typically be low or moderate in perceived susceptibility for incidents of mass violence but moderate in perceived susceptibility

for natural disasters. Results showed that perceived susceptibility for natural disasters was not moderate for all disasters, but rather ranged from low (for hurricanes, earthquakes, and blizzards) to high (for severe thunderstorms; Table 4). As hypothesized, perceived susceptibility for incidents of mass violence was typically low (Table 4). Generally, perceived susceptibility for more frequent disasters was higher, suggesting that employees had accurate perceptions of relative disaster susceptibility. The exception was that they perceived earthquake susceptibility to be low, despite the New Madrid fault line along the southern Mississippi river area, which is the second-most earthquake prone region in the U.S. (Frankel et al., 2009). Susceptibility perceptions reported by employees were similar to those reported by students at the same university; perceptions of the relative likelihood of different disaster types was accurate, except employees underrated earthquake likelihood as unlikely to occur in the next year, just as students had (Weber, Tkachuck, Weathers, & Schulenberg, 2015). Low earthquake likelihood ratings may be due to the lapse in time since the last major earthquake at the New Madrid fault line, despite regular small and moderate earthquakes and a high probability that a major one will occur (Frankel et al., 2009).

Conditional Process Model

The hypothesized model incorporated sex as a moderator rather than as a covariate. For incidents of mass violence, this model (Model 37) better predicted outcomes than when sex was included as a covariate (Model 18). For natural disasters, a model comparison analysis showed that Model 37 better modeled the overall outcome of preparedness behaviors than Model 18, so Model 37 was selected. Conditional process modeling partially supported the current study's hypotheses. For both natural disasters and incidents of mass violence, there was no direct effect of previous experience on preparedness behavior (Hypothesis 1). The lack of a direct effect

suggests that the effect of experience is indirect, via perceived susceptibility. Considering the mixed conclusions in the literature regarding experience as a predictor of preparedness (Kohn et al., 2012; Wachinger et al., 2012), we turn to the second hypothesis to elucidate this interpretation further.

Supporting the second hypothesis, perceived susceptibility mediated the effect of experience of mass violence on preparedness behaviors for incidents of mass violence, under some conditions. Thus, the second hypothesis was supported for incidents of mass violence, but was not supported for natural disasters (see “Measurement Issues” for a discussion of this difference). Like disaster experience, perceived susceptibility is sometimes correlated with preparedness behavior, but this is not always the case (Kohn et al., 2012; Wachinger et al., 2012). Moreover, perceived susceptibility has been found to mediate the relationship between threat messages and intention to engage in preparedness behavior (Dillon et al., 2014). The present findings for incidents of mass violence clarify the correlational discrepancy and corroborate Dillon et al.’s mediation, in accord with EPPM theory; the role of perceived susceptibility as a mediator supports the theory that external threat messages (e.g., experience) contribute to threat perceptions, which contribute to danger control processes (e.g., preparedness behavior).

For incidents of mass violence, the conditions under which perceived susceptibility mediated the effect of experience on preparedness behaviors were when self-efficacy was moderate or higher and when employees were female. In this way, the third hypothesis, that sex would moderate the mediation, was supported for incidents of mass violence. Furthermore, regardless of disaster experience, women were more likely to report high perceived susceptibility to both natural disasters and incidents of mass violence, even when perceived susceptibility was

not related to actual preparedness behaviors (as was the case for natural disasters). This corroborates Tkachuck's study (2016), which found an association between sex and threat perception for university students. It also corroborates a review of threat perception and preparedness (Wachinger et al., 2012) which found, in some studies, that sex mediated associations between threat perception, self-efficacy, and preparedness, but did not generally have a main effect on preparedness. Furthermore, the role of sex as a moderator for incidents of mass violence means that *women* typically engage in preparedness behaviors only when they have a sense of self-efficacy and high threat perception. This helps clarify why some studies have found correlations between women and lower preparedness (DeBastiani et al., 2015; Kohn et al., 2012; Simms et al., 2013). Additionally, disaster researchers have posed reasons women often report being less prepared than men, such as their lack of socioeconomic power (Fothergill, 1998) or their lack of involvement in emergency management (Ashraf & Azad, 2015). The current study suggests that, while women are more likely to have higher threat perception than men with similar disaster experience, they are more likely to report lower levels of self-efficacy. Therefore, self-efficacy appears to be a key to engaging individuals in disasters preparedness behaviors, but even more so for women than men. It should also be noted that the difference in perceived susceptibility between men and women could indicate that women are more accurate in their perceptions, while men underestimate disaster likelihood. There is some support for this in the literature, such as a study of flood risk perception of Australian coastal residents, which compared coastal residents' flood risk projections to those of climate experts. They found women had higher risk perception of the likelihood of temporary floods before the year 2100, and that this higher risk perception was closer to climate experts' objective risk projections (Mills et al., 2016). However, while women also had higher perceived risk of permanent

flooding, they still underestimated this risk. So, it is unclear from the literature and from the present study whether women are accurate in their risk perception, or whether they tend to underestimate the likelihood of disasters.

The fourth hypothesis, that disaster impact would moderate the mediation, was not supported. However, disaster impact and self-efficacy both had direct effects on preparedness behaviors for both natural disasters and incidents of mass violence. Furthermore, for natural disasters, self-efficacy moderated the effect of disaster impact on preparedness behavior, thus partially supporting the hypothesis that self-efficacy would moderate disaster impact while disaster impact moderates the mediation. The EPPM distinguishes between susceptibility and severity, but categorizes them jointly as the two components of threat messages and the two components of threat perceptions (Figure 1; Witte, 1992). The role of natural disaster self-efficacy as a moderator of natural disaster impact suggests that severity messages only contribute to increased preparedness when self-efficacy is high. Because perceived susceptibility did not predict natural disaster preparedness, not even when moderated by self-efficacy, it could be that perceived susceptibility is simply not an essential factor in natural disaster preparedness. However, this would differ from the findings for incidents of mass violence, and the mixed findings in the existing literature (Dillon et al., 2014; Kohn et al., 2012; Wachinger et al., 2012), which suggest it sometimes predicts preparedness. It is possible that inclusion of perceived severity (the second component of perceived threat), which was not measured in this study, is needed for a more complete model.

As stated above, the fifth hypothesis, that self-efficacy would moderate the moderation, was supported for incidents of mass violence. Like experience and perceived susceptibility, self-efficacy sometimes predicts preparedness behavior (DeBastiani et al., 2015), but not always

(Wachinger et al., 2012). The role of self-efficacy as a moderator is in accord with EPPM theory, in which both perceived susceptibility and self-efficacy are considered necessary factors for engagement in preparedness behavior (Witte, 1992).

Measurement Issues. One question warranting discussion is why perceived susceptibility mediated the effect of experience on preparedness for incidents of mass violence, but not for natural disasters. Furthermore, while disaster experience had a direct effect on perceived susceptibility for both natural disasters and incidents of mass violence, perceived susceptibility did not have a significant direct effect on preparedness behavior for natural disasters. Thus, in terms of natural disasters, neither experience nor perceived susceptibility were significantly related to increased preparedness. One explanation is that this finding could be due to problems with how the variables were measured. The disaster experience variable measured types of disasters, not total number of disasters experienced (i.e., it is unknown how many tornadoes, hurricanes, etc. were experienced by each respondent); however, for incidents of mass violence, the total count was low for all employees, so the measurement of number of disasters would be similar to the count of times experienced. Thus, it could be that frequency of disaster experience, rather than range of disaster types experienced, would be a more appropriate measure of threat message for natural disasters (and any disaster, for that matter). Furthermore, it is important to consider that age may have been a confound in the measurement of disaster experience, for older employees had, of course, experienced more natural disasters. Future research would benefit from improved measures of disaster experience that capture frequency, intensity, and array of disasters experienced.

Overall model of natural disasters. Despite finding no statistically significant support for the role of experience and perceived susceptibility in natural disaster preparedness, the model

for natural disasters presented continues to offer some support for the EPPM. First, experience of natural disasters, the external threat message, was related to perceived susceptibility to natural disasters. Although perceived susceptibility was not related to preparedness behavior, the other threat message component, disaster impact, did have a direct effect on preparedness behaviors. Likewise, self-efficacy had a direct effect on preparedness behavior. Furthermore, there was an interaction effect of disaster impact by self-efficacy, such that preparedness behaviors were higher when both self-efficacy and disaster impact were high. In this way, the current study's findings on natural disasters support the EPPM theory that external stimuli influence threat perception, and that both threat messages and self-efficacy are related to engagement in preparedness behavior.

Overall model of incidents of mass violence. Despite differences from the model for natural disasters, the model for incidents of mass violence clearly supports the EPPM. Disaster experience was not directly related to preparedness behavior, but was indirectly related via perceived susceptibility. In other words, employees who had experienced school shootings, terrorist attacks, bomb threats, or other forms of violence were more prepared when their perceived susceptibility to these events was higher. This supports the theory that perceptions of threat are the process by which threat messages influence danger control behaviors. Furthermore, this mediation was moderated by self-efficacy, meaning that perceived susceptibility predicted greater preparedness behavior when self-efficacy was also high. Self-efficacy also had a direct effect on preparedness behavior, meaning that regardless of experience or perceived susceptibility, employees with higher self-efficacy tended to be more prepared for incidents of mass violence. The lack of effects related to disaster impact could be because scores on this variable were so low for incidents of mass violence that they were skewed towards low impact

even after they were transformed. Thus, a larger sample size, or a study specifically targeting individuals who have been impacted by incidents of mass violence, might be necessary in order to detect an effect of this variable. Overall, the current study's findings on incidents of mass violence support the EPPM theory that external stimuli influence threat perception, and that both threat perception and self-efficacy are critical for engagement in preparedness behavior.

Limitations of the Study

Although reviews of the literature indicate that the majority of disaster research studies are cross-sectional in nature (Kellens, Terpstra, & DeMaeyer, 2013; Savoia et al., 2009), this is still a limitation despite the current methodology being consistent with the available literature. The lack of experimental design in the present study precludes causal inferences from predictors to outcomes, including predictors of the mediator, and the mediator as a predictor. It is useful to model predictors such that future studies can explore factors that could increase disaster preparedness behavior, but direction of effects should not be assumed.

Secondly, analyses were selected based on the theoretical EPPM; however, not all variables in the EPPM were included in the analysis because pre-existing, available data were used. Improvements in future studies could include accounting for other threat messages beyond direct experience (e.g., media exposure), messages of self-efficacy, and measures of fear surrounding disasters. For example, exposure to disaster-related information and training with messages of self-efficacy (e.g., "How you can prepare") or messages of fear (e.g., "Tornadoes are killers") could be one way to measure messages. Another might be measuring exposure to news reports on local, national, and international disasters. Additionally, the present study lacks a measure of frequency of disasters experienced. Variety in disaster types experienced is qualitatively different from number of disasters experienced; however, the Disaster Experience

variable was conceptualized as a threat message because it describes breadth of disaster experience, albeit not depth.

Issues with the Disaster Experience variable were compounded by missing data on age, likely due to the method of entry in the online survey. Age was one of the only variables in the survey that required typing in a response, rather than clicking a multiple choice answer. For this reason, despite a moderate correlation between age and disaster experience, age was not controlled for in the conditional process analyses.

A minor study limitation was the extreme skewness of the Disaster Experience and Disaster Impact variables for incidents of mass violence, such that they were still skewed after being transformed. However, Hayes asserts that conditional process tests are robust to violations of normality (2013b). Furthermore, violations of normality do not influence the interaction effects, due to bootstrapping.

Another minor study limitation was the way faculty and staff were categorized. Some participants were unsure how to describe their roles (e.g., IT support, administrative staff for a non-academic office, such as the bursar). For those who gave a sufficient open-ended description, any in the “other” role category or who selected no category were re-coded into one of the three role types, based on their job descriptions. Furthermore, because descriptive results for all groups (faculty, academic staff, and non-academic staff) were largely homogeneous, this did not present an issue for conducting the conditional process analyses.

Of course, disaster preparedness behavior is not fully encapsulated by the six behaviors examined in this study (reading mass emails, reading emergency alert text messages, reading informational signs and posters, having access to a first aid kit, knowing where to access a weather radio, and watching the active shooter response video). Although they were appropriate

measures of basic preparedness for the target population and setting, they limit the generalizability of the current study's findings, for variety in operationalization of disaster preparedness could alter the model. For example, questions about more in-depth preparedness behaviors, such as regular practice of drills, or questions about disaster knowledge like knowing where to go or what to do for different disasters, might be predicted by different levels of experience, impact, perceived susceptibility, and self-efficacy. Inclusion of more in-depth preparedness behaviors could improve the generalizability of this study's findings while maintaining relevance for the university setting and target population of faculty and staff.

Strengths of the Study

A strength of the study was the sample size, which was larger than 80% of samples used for mediation analysis (Fritz & MacKinnon, 2007). A second strength was that the study focused on a critical target population, university employees, a group that has been overlooked in disaster preparedness research, despite regional risks in the U.S. and despite increased risk of mass violence at schools. For this reason, even the basic descriptive results reported in this study are essential for identifying the degree of preparedness of university employees, as well as specific areas in need of improvement. Third, the inclusion of both natural disasters and incidents of mass violence contributes to understanding the similarities and differences between perceptions and behaviors for each of these disaster classes, and helps to build a unified theory of disaster preparedness by highlighting the common ways perceptions, self-efficacy, and threat messages predict preparedness for both. Finally, this study stands apart for building on qualitative and quantitative exploratory groundwork to model preparedness behavior in coherence with a broader health behavior theory.

Future Research Directions

A next step in this program of research should be to incorporate other components of the EPPM that were not included in this study, particularly fear. Along with threat perception and self-efficacy, the constructs of fear, worry, or concern regarding disasters have been explored in relation to threat perception (see for example, Boscarino et al., 2003; Davis, 2016; Greenberg & Babcock-Dunning, 2012; Hawdon, Rasanen, Oksanen, & Vuori, 2014; Karanci et al., 2005; Lovekamp & McMahon, 2011; Miceli, Sotgiu, & Settanni, 2008; Tkachuck, 2016; Wolff & Larsen, 2014). Despite differences between the constructs of fear or concern and risk perception, fear regarding disasters has even been combined with the construct of threat perception (Miceli, et al., 2008; Sattler, Kaiser, & Hittner, 2000). However, fear of disasters does not appear to be related to positive outcomes. For instance, Tkachuck (2016) found no relationship between concern for disasters and increased preparedness among university students. Moreover, Hawdon et al. (2014) hypothesized that fear of collective crime (which includes incidents of mass violence) might be related to community solidarity, but found no support for this. Likewise, high levels of fear among New York City residents after the September 11 terrorist attacks were associated with intent to flee before given an evacuation order, rather than seeking out and complying with emergency response orders (Boscarino et al., 2003). Furthermore, an earthquake training program that focused only on risk perception, not self-efficacy, led to higher threat perception and worry, while preparedness behavior remained low (Karanci et al., 2005). Similarly, according to the EPPM, fear should be related to high threat perception but low disaster preparedness behavior. Therefore, in order to build a more comprehensive theory of disaster preparedness, it is important to include fear in future models.

In addition to distinguishing between and accounting for both threat perception and fear,

future studies should include perceived severity, the second component of perceived threat (perceived likelihood being the first). Similarly, another step in building on the findings of this study would be to strengthen the measurement of threat messages by accounting for number of disasters experienced and incorporating other forms of threat messages beyond direct experience, such as media exposure. Furthermore, preparedness behaviors other than the six included in this study should be considered for their relevance to both the target population and setting. For example, questions about access to additional materials, knowledge of the institution's disaster plan and established procedures, and knowledge of where to go and where to direct students during emergencies of different types. Additionally, future studies should control for age when modeling predictors of preparedness behaviors. Likewise, the relationship between sex, perceived susceptibility, and self-efficacy warrants further exploration. Furthermore, in order to more clearly identify whether and to what extent university personnel are prepared regarding specific behaviors, measures of university role could be more specific about the jobs held by staff. Lastly, building on this study's conditional process analysis, structural equation modeling (SEM) methods could be used to model predictors of preparedness behaviors with increased causal inference.

Institutional Recommendations

Based on both descriptive and conditional process results of this study, recommendations are made specifically for the institution at which the study was conducted (The University of Mississippi). Many of the specific institutional recommendations may be useful at other institutions of higher learning. Beyond the institution where these data were collected, findings from this study can guide efforts of higher education institutions, specifically their endeavors to prepare faculty and staff. Interventions aimed at faculty and staff should not just mirror

interventions in place for students, for they should include teaching employees how to guide students, not just how to protect themselves. Through such strategies, institutions can work to enhance the self-efficacy of their employees with regard for disaster preparedness.

Assessment and planning.

1. Institutions should consider that employees who have experienced a broad range of disasters or a high-impact disaster are more likely to be prepared. These individuals would be valuable assets in terms of informing institutional preparedness efforts. However, while people tend to be remarkably resilient (Aiena, Buchanan, Smith, & Schulenberg, 2015), institutions should also be aware of possible acute and posttraumatic stress responses in individuals with disaster experience and facilitate mental health treatment, as necessary.
2. Institutions should recognize that perceptions of natural disasters and incidents of mass violence may vary widely based on prevalence at that specific institution and/or surrounding community. It is recommended they include both forms of disasters in institutional plans and ensure that preparedness programs target both.

Information to disseminate.

3. Considering the lack of empirical support for fear as a predictor of preparedness (Boscarino, et al., 2003; Karanci et al., 2005), preparedness initiatives should aim to build accurate risk perceptions, rather than to downplay risk or incite fear. Institutions should include information about disaster frequency and impact when disseminating information on how to prepare.
4. Because risk perceptions for earthquakes were inaccurate, information on earthquakes should be prioritized like information about other regional risks, such as thunderstorms, floods, and tornadoes. Similarly, other institutions should identify the primary natural disaster risks in

their region, assess risk perceptions, and target disaster types for which inaccurate risk perception is common.

5. Educational initiatives, from informational posters to interactive workshops, should balance threat messages with messages of self-efficacy. Again, considering the lack of empirical support for fear tactics (Boscarino et al., 2003; Karanci, et al., 2005), they could be supplanted by messages of self-efficacy. For example, phrases like “Are you ready” or “Ways you can prepare” could be used.
6. Preparedness initiatives should emphasize self-efficacy with both men and women, but with particular regard for women. A primary reason for this emphasis is the literature that shows that women are often high in threat perception and tend to report lower levels of self-efficacy.
7. Institutions should emphasize specific behaviors employees can engage in to prepare for disasters, such as the six identified in this study (access to first aid kits in their buildings, access to a weather radios in their buildings, watching available videos on disaster response, reading posted signs, reading mass emails, and reading emergency text message alerts).

Ways to practice and inform.

8. Institutions should conduct regular drills at the main campus, as well as satellite campuses, for natural disasters (e.g., tornadoes, earthquakes) and also incidents of mass violence (e.g., when/how to shelter in place).
9. At new employee orientations, institutions should provide information and training on responding to and preparing for mass casualty events such as tornadoes, earthquakes, and active shooter scenarios.
10. Universities should work to make posters easier to read, as well as more likely to attract

attention. Moreover, they should make a plan to refresh or update posters periodically.

11. Institutions should check with building “mayors” to ensure each one still has a working weather radio (building mayors received them several years ago from the institution where data were collected). They should communicate with faculty and staff in each building as to the location/accessibility of weather radios. Institutions that do not have an assigned point-person for each building are encouraged to designate one.
12. Universities should give all building “mayors” a first aid kit and notify building faculty and staff as to its location.

Recommendations specific to faculty.

13. For faculty who teach, emergency procedures should be discussed while reviewing syllabi on the first day of class and periodically throughout the semester as the context dictates (e.g., peak tornado months).
14. Faculty should become familiar with the safe areas of the buildings they frequent (e.g., in relation to tornadoes, the lowest floor, away from windows) and what to do during a potential mass casualty event (e.g., how to shelter in place during an active shooter incident on campus). Faculty are also urged to attend the active shooter workshop offered periodically by university police personnel.
15. Ask department chairs to discuss disaster preparedness as a part of a faculty meeting, at a minimum on an annual basis and periodically as needed. The discussion could include university police, a presentation of the active shooter response video, and/or additional videos or materials that are available for other types of disasters. Institutions should consider developing an online training module that can be completed by employees on an annual basis. Such a module should address both natural disasters and incidents of mass violence.

Conclusion

The current study met its goal of modeling predictors of preparedness for both natural disasters and incidents of mass violence. It also met the second goal of describing disaster preparedness of university faculty and staff in a disaster-prone region, thus providing an assessment of preparedness strengths and weaknesses for a demographic often overlooked in the literature and sorely in need of being studied. By modeling preparedness predictors and describing disaster preparedness of university employees, the results of this study inform practical recommendations for a specific school of higher education, with strong relevance to other schools of higher education in disaster-prone areas throughout the U.S. Furthermore, the current study furthers disaster preparedness research by serving as a step in the process of building a comprehensive theory of individual and institutional disaster preparedness.

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LIST OF APPENDICIES

APPENDIX A: TABLES

Table 1. *Frequency of Experience by Disaster Type, Overall Sample and by University Role*

Disaster type	Overall N (percent)	Faculty n (percent by role)	Academic Staff n (percent by role)	Non-Academic Staff n (percent by role)
Severe thunderstorm	358 (87.3%)	119 (86.2 %)	82 (89.1%)	157 (87.2%)
Tornado	266 (64.9%)	82 (59.4%)	61 (66.3%)	123 (68.3%)
Earthquake	80 (19.9%)	38 (27.5%)	11 (12.0%)	31 (17.2%)
Flood	123 (30.0%)	52 (37.7%)	26 (28.3%)	45 (25.0%)
Hurricane	185 (45.1%)	69 (50.0%)	40 (43.5%)	76 (42.2%)
Blizzard/Snow storm	209 (51.0%)	93 (67.4%)	39 (42.4%)	77 (42.8%)
Ice storm	321 (78.3%)	108 (78.3%)	74 (80.4%)	139 (77.2%)
Terrorist attack	12 (2.9%)	4 (2.9%)	3 (3.3%)	5 (2.8%)
School shooting	13 (3.2%)	5 (3.6%)	4 (4.3%)	4 (2.2%)
Bomb threat	80 (19.5%)	26 (18.8%)	15 (16.3%)	39 (21.7%)
Other violence	4 (0.9%)	3 (2.2%)	0 (0.0%)	1 (0.5%)
No natural disaster experience	20 (4.9%)	6 (4.3%)	4 (4.3%)	10 (5.6%)
No mass violence experience	319 (77.8%)	107 (77.5%)	74 (80.4%)	138 (76.7%)
No disaster experience	10 (2.4%)	3 (2.2%)	2 (2.2%)	5 (2.8%)

Table 2. *Frequency of Ways Natural Disasters had an Impact, Overall Sample and by University Role*

Form of impact	Overall N (percent)	Faculty n (percent by role)	Academic Staff n (percent by role)	Non-Academic Staff n (percent by role)
Injured	7 (1.7%)	1 (0.7%)	4 (4.3%)	2 (1.1%)
Saw others injured or killed	60 (14.6%)	20 (14.5%)	18 (19.6%)	22 (12.2%)
Felt a direct threat to one's life	161 (39.3%)	54 (39.1%)	37 (40.2%)	70 (38.9%)
Provided first aid	49 (12.0%)	14 (10.1%)	16 (17.4%)	19 (10.6%)
Lost a significant amount of material possessions	49 (12.0%)	14 (10.1%)	9 (9.8%)	26 (14.4%)
Could not get in touch with other family members	114 (35.1%)	42 (30.4%)	36 (39.1%)	66 (36.7%)
Separated from members of immediate family	83 (20.2%)	26 (18.8%)	21 (22.8%)	36 (20.0%)
Could not get to a store for three or more days	171 (41.7%)	47 (34.1%)	41 (44.6%)	83 (46.1%)
Lost electricity for three or more days	281 (68.5%)	88 (63.8%)	67 (72.8%)	126 (70.0%)
Forced to evacuate	38 (9.3%)	17 (12.3%)	9 (9.8%)	12 (6.7%)
Had to leave home for three or more days	89 (21.7%)	24 (17.4%)	23 (25.0%)	42 (23.3%)
Had to leave work/school	217 (52.9%)	82 (59.4%)	44 (47.8%)	91 (50.6%)
No impact reported	58 (14.1%)	19 (13.8%)	13 (14.1%)	26 (14.4%)

Table 3. *Frequency of Ways Incidents of Mass Violence had an Impact on Those Who Experienced Them, Overall, and by University Role*

Form of impact	Of those who experienced mass violence (<i>n</i> = 101)	Overall <i>N</i> (percent)	Faculty <i>n</i> (percent by role)	Academic Staff <i>n</i> (percent by role)	Non-Academic Staff <i>n</i> (percent by role)
Injured	3.0%	3 (0.7%)	1 (0.7%)	1 (1.1%)	1 (0.6%)
Saw others injured or killed	7.9%	8 (2.0%)	2 (1.4%)	2 (2.2%)	4 (2.2%)
Felt a direct threat to one's life	10.9%	11 (2.7%)	3 (2.2%)	1 (1.1%)	7 (3.9%)
Provided first aid	5.9%	6 (1.5%)	2 (1.4%)	2 (2.2%)	2 (1.1%)
Lost a significant amount of material possessions	1.0%	1 (0.2%)	1 (0.7%)	0 (0.0%)	0 (0.0%)
Could not get in touch with other family members	10.9%	11 (2.7%)	3 (2.2%)	3 (3.3%)	5 (2.8%)
Separated from members of immediate family	6.9%	7 (1.7%)	2 (1.4%)	3 (3.3%)	2 (1.1%)
Could not get to a store for three or more days	1.0%	1 (0.2%)	1 (0.7%)	0 (0.0%)	0 (0.0%)
Lost electricity for three or more days	2.0%	2 (0.5%)	2 (1.4%)	0 (0.0%)	0 (0.0%)
Forced to evacuate	5.9%	6 (1.5%)	1 (0.7%)	2 (2.2%)	3 (1.7%)
Had to leave home for three or more days	2.0%	2 (0.5%)	1 (0.7%)	0 (0.0%)	1 (0.6%)
Had to leave work/school	7.9%	8 (2.0%)	4 (2.9%)	3 (3.3%)	1 (0.6%)
No impact reported	81.2%	391 (95.4%)	131 (94.9%)	87 (94.6%)	173 (96.1%)

Table 4. *Perceived Susceptibility by Disaster Type, Overall and by University Role*

Disaster type	Overall <i>M, SD</i>	Faculty <i>M, SD</i>	Academic Staff <i>M, SD</i>	Non-Academic Staff <i>M, SD</i>
Severe thunderstorm	6.14, 1.25	6.03, 1.37	6.14, 1.27	6.24, 1.13
Tornado	4.99, 1.43	4.69, 1.39	5.02, 1.60	5.21, 1.35
Earthquake	2.46, 1.32	2.20, 1.22	2.62, 1.45	2.58, 1.30
Flood	3.47, 1.57	3.43, 1.52	3.47, 1.71	3.52, 1.54
Hurricane	2.03, 1.21	2.07, 1.12	1.93, 1.23	2.04, 1.29
Blizzard/Snow storm	2.94, 1.57	2.72, 1.56	4.12, 1.42	3.13, 1.60
Ice storm	4.14, 1.56	3.89, 1.72	2.90, 1.46	4.34, 1.50
Terrorist attack	2.39, 1.45	2.06, 1.20	2.52, 1.65	2.57, 1.48
School shooting	3.31, 1.54	3.07, 1.45	3.50, 1.63	3.39, 1.53
Bomb threat	3.26, 1.52	2.98, 1.40	3.48, 1.58	3.37, 1.56

Note. Mean scores could range from 1 to 7. Mean scores 3 or lower were considered low, mean scores greater than 3 but less than 5 were considered moderate, and mean scores of 5 or higher were considered high.

Table 5. *Personal Self-Efficacy by Disaster Type, Overall and by University Role*

Disaster type	Overall <i>M, SD</i>	Faculty <i>M, SD</i>	Academic Staff <i>M, SD</i>	Non-Academic Staff <i>M, SD</i>
Severe thunderstorm	6.14, 1.19	5.43, 1.54	6.25, 1.09	6.35, 1.08
Tornado	5.99, 1.32	5.33, 1.66	6.10, 1.27	6.21, 1.13
Earthquake	4.35, 1.82	4.26, 1.84	4.38, 1.86	4.45, 1.84
Flood	4.93, 1.68	4.69, 1.69	4.87, 1.77	5.09, 1.64
Hurricane	4.86, 1.92	4.70, 1.81	4.76, 2.00	4.90, 1.97
Blizzard/Snow storm	5.37, 1.66	4.99, 1.75	5.47, 1.69	5.39, 1.63
Ice storm	5.47, 1.49	4.98, 1.68	5.50, 1.59	5.59, 1.45
Terrorist attack	3.48, 1.84	3.28, 1.93	3.80, 1.99	3.55, 1.76
School shooting	4.28, 1.72	3.63, 1.87	4.66, 1.70	4.45, 1.68
Bomb threat	4.12, 1.80	3.56, 1.94	4.46, 1.85	4.20, 1.74

Note. Mean scores could range from 1 to 7. Mean scores 3 or lower were considered low, mean scores greater than 3 but less than 5 were considered moderate, and mean scores of 5 or higher were considered high.

Table 6. *Self-Efficacy Guiding Students by Disaster Type, Overall and by University Role*

Disaster type	Overall <i>M, SD</i>	Faculty <i>M, SD</i>	Academic Staff <i>M, SD</i>	Non-Academic Staff <i>M, SD</i>
Severe thunderstorm	5.73, 1.42	5.43, 1.54	5.95, 1.28	5.84, 1.37
Tornado	5.54, 1.57	5.34, 1.66	5.85, 1.41	5.55, 1.56
Earthquake	4.32, 1.95	4.26, 1.84	4.52, 2.02	4.27, 2.00
Flood	4.82, 1.68	4.69, 1.69	4.97, 1.80	4.86, 1.61
Hurricane	4.68, 1.92	4.71, 1.82	4.60, 2.16	4.69, 1.88
Blizzard/Snow storm	5.03, 1.72	4.99, 1.75	5.03, 1.79	5.06, 1.67
Ice storm	5.13, 1.62	4.98, 1.68	5.15, 1.69	5.23, 1.54
Terrorist attack	3.47, 2.00	3.28, 1.93	3.76, 2.16	3.46, 1.95
School shooting	3.87, 1.89	3.63, 1.87	4.20, 1.93	3.90, 1.87
Bomb threat	3.86, 1.98	3.56, 1.94	4.22, 2.04	3.91, 1.95

Note. Mean scores could range from 1 to 7. Mean scores 3 or lower were considered low, mean scores greater than 3 but less than 5 were considered moderate, and mean scores of 5 or higher were considered high.

Table 7. *Frequency of Preparedness Behaviors, Overall and by University Role*

Emergency type	Overall N (percent)	Faculty n (percent by role)	Academic Staff n (percent by role)	Non-Academic Staff n (percent by role)
<i>Read mass emails</i>	372 (92.5%)	124 (91.9%)	84 (92.3%)	164 (93.2%)
<i>Read emergency text messages</i>	355 (88.8%)	114 (84.4%)	82 (91.1%)	159 (90.9%)
<i>Access to first aid kit</i>	266 (65.4%)	74 (53.6%)	68 (74.7%)	124 (69.7%)
Access to weather radio	94 (23.2%)	20 (14.6%)	25 (27.5%)	49 (27.5%)
Read informational posters	310 (77.1%)	107 (79.3%)	61 (67.0%)	142 (80.7%)
<i>Saw active shooter response educational video</i>	106 (26.4%)	19 (14.1%)	24 (26.4%)	63 (35.8%)

Note. **Bold** = weather-related. *Italicized* = violence-related.

Table 8. *Natural Disaster Model Coefficients for Moderated Mediation Analysis with Sex as a Moderator of the Mediation and the Direct Effect (Model 37)*

Antecedent		Consequent						
		M (Perceived Susceptibility)			Y (Preparedness Behavior)			
		Coefficient	SE	p (1-tailed)	Coefficient	SE	p (1-tailed)	
X (Experience)	<i>a</i>_{1i}	.0939	.0280	.0009	<i>c'</i>	-.0379	.0341	.1335
W (Sex)	<i>a</i>_{2i}	-.2258	.0976	.0101	---	---	---	---
XW	<i>a</i> _{3i}	-.0745	.0582	.1001	---	---	---	---
<i>M</i> _i (Perc. Suscep.)	---	---	---	---	<i>b</i> _{1i}	.0362	.0549	.2552
V (Impact)	---	---	---	---	<i>b</i>₂	.0379	.0222	.0445
<i>Q</i> (Self-efficacy)	---	---	---	---	<i>b</i>₃	.2426	.0435	< .0001
<i>M</i> _i V	---	---	---	---	<i>b</i> _{4i}	-.0162	.0226	.2374
<i>M</i> _i <i>Q</i>	---	---	---	---	<i>b</i> _{5i}	.0096	.0427	.4113
V <i>Q</i>	---	---	---	---	<i>b</i>₆	.0349	.0161	.0153
<i>M</i> _i V <i>Q</i>	---	---	---	---	<i>b</i> _{7i}	-.0022	.0152	.4424
Constant	<i>i</i> ₁	.0075	.0465	.436	<i>i</i> ₂	4.4214	.0487	<.0001
<i>R</i>² = .0405				<i>R</i>² = .1159				
<i>F</i>(3, 398) = 5.597, <i>p</i> = .0009				<i>F</i>(8, 393) = 6.438, <i>p</i> < .0001				

Note. *N* = 402. Bold indicates *p* < .05.

Table 9. Incidents of Mass Violence Model Coefficients for Moderated Mediation Analysis with Sex as a Moderator of the Mediation and the Direct Effect (Model 37)

Antecedent		Consequent						
		M (Perceived Susceptibility)			Y (Preparedness Behavior)			
		Coefficient	SE	p (1-tailed)		Coefficient	SE	p (1-tailed)
X (Experience)	a1_i	.9628	.4698	.0201	<i>c'</i>	-.2198	.3309	.2535
W (Sex)	a2_i	-.2551	.1390	.0336	---	---	---	---
XW	<i>a3_i</i>	-1.4930	.9200	.0527	---	---	---	---
<i>M_i</i> (Perc. Suscep.)	---	---	---	---	b1_i	.0742	.0313	.0091
V (Impact)	---	---	---	---	<i>b2</i>	-.2244	.3888	.2821
<i>Q</i> (Self-efficacy)	---	---	---	---	b3	.1500	.0265	< .0001
<i>M_i V</i>	---	---	---	---	<i>b4_i</i>	.1190	.1150	.2217
<i>M_i Q</i>	---	---	---	---	<i>b5_i</i>	-.0274	.2053	.4470
<i>VQ</i>	---	---	---	---	<i>b6</i>	.0186	.0180	.1507
<i>M_i VQ</i>	---	---	---	---	<i>b7_i</i>	-.0657	.0963	.2480
Constant	<i>i1</i>	.0139	.0663	.4169	<i>i2</i>	3.7020	.0405	< .0001
R² = .0211				R² = .1096				
F(3, 397) = 2.8496, p = .0373				F(8, 392) = 6.0307, p < .0001				

Note. N = 402. Bold indicates $p < .05$.

Table 10. *Natural Disaster Model Coefficients for Moderated Mediation Analysis with Sex as a Covariate (Model 18)*

Antecedent		Consequent						
		M (Perceived Susceptibility)			Y (Preparedness Behavior)			
		Coefficient	SE	p (1-tailed)	Coefficient	SE	p (1-tailed)	
X (Experience)	<i>a</i> _{1i}	.0933	.0280	.0005	<i>c</i> '	-.0378	.0342	.1353
C (Sex)	<i>f</i> ₁	-.2352	.0974	.0082	<i>f</i> ₂	-.0078	.1026	.4698
<i>M</i> _i (Perc. Suscep.)	---	---	---	---	<i>b</i> _{1i}	.0357	.0553	.2593
<i>V</i> (Impact)	---	---	---	---	<i>b</i> ₂	.0381	.0224	.0448
<i>Q</i> (Self-efficacy)	---	---	---	---	<i>b</i> ₃	.2428	.0437	< .0001
<i>M</i> _i <i>V</i>	---	---	---	---	<i>b</i> _{4i}	-.0162	.0226	.2356
<i>M</i> _i <i>Q</i>	---	---	---	---	<i>b</i> _{5i}	.0098	.0429	.4097
<i>VQ</i>	---	---	---	---	<i>b</i> ₆	.0350	.0161	.0154
<i>M</i> _i <i>VQ</i>	---	---	---	---	<i>b</i> _{7i}	-.0022	.0152	.4419
Constant	<i>i</i> ₁	-.1300	.1820	.2377	<i>i</i> ₂	4.6134	.2144	< .0001
<i>R</i>² = .0365				<i>R</i>² = .1159				
<i>F</i>(2, 399) = 7.5636, <i>p</i> = .0006				<i>F</i>(9, 392) = 5.7091, <i>p</i> < .0001				

Note. *N* = 402. Bold indicates *p* < .05.

Table 11. *Incidents of Mass Violence Model Coefficients for Moderated Mediation Analysis with Sex as a Covariate (Model 18)*

Antecedent		Consequent						
		M (Perceived Susceptibility)			Y (Preparedness Behavior)			
		Coefficient	SE	p (1-tailed)	Coefficient	SE	p (1-tailed)	
X (Experience)	<i>a</i> _{1i}	.7987	.4597	.0416	<i>c'</i>	-.2127	.3330	.5233
C (Sex)	<i>f</i> ₁	-.2662	.1391	.0282	<i>f</i> ₂	-.0185	.0880	.4166
<i>M</i> _i (Perc. Suscep.)	---	---	---	---	<i>b</i> _{1i}	.0733	.0316	.0104
V (Impact)	---	---	---	---	<i>b</i> ₂	-.2264	.3894	.2807
<i>Q</i> (Self-efficacy)	---	---	---	---	<i>b</i> ₃	.1512	.0271	< .0001
<i>M</i> _i V	---	---	---	---	<i>b</i> _{4i}	-.0291	.2057	.4438
<i>M</i> _i <i>Q</i>	---	---	---	---	<i>b</i> _{5i}	.0189	.0181	.1477
<i>VQ</i>	---	---	---	---	<i>b</i> ₆	.1192	.1552	.2215
<i>M</i> _i <i>VQ</i>	---	---	---	---	<i>b</i> _{7i}	-.0659	.0965	.2474
Constant	<i>i</i> ₁	.2998	.1981	.0656	<i>i</i> ₂	3.7432	.1257	< .0001
<i>R</i> ² = .0146				<i>R</i> ² = .1097				
<i>F</i> (2, 398) = 2.9455, <i>p</i> = .0537				<i>F</i> (9, 391) = 5.3525 , <i>p</i> < .0001				

Note. *N* = 401. Bold indicates *p* < .05.

Table 12. *Model Comparison Analysis for Natural Disasters Using Akaike's Information Criterion (AIC)*

	<i>k</i> (parameters in model)	Mean Square Error (MSE)	Residual sum of squares (RSS)	AIC	Probability model is correct	Difference in AIC	Information ratio
Predicting M_i (Perceived susceptibility)							
Model 37	4	.8567	340.967	-56.04	>99.99%	0.39	1.21
Model 18	3	.8581	342.382	-56.43	>99.99%		
Predicting Y (Preparedness behavior)							
Model 37	9	.9070	356.451	-27.78	>99.99%	2.11	2.87
Model 18	10	.9093	356.446	-25.67	>99.99%		

Note. All $N = 402$. $AIC = N \cdot \ln(RSS/N) + 2k$. A lower AIC value indicates a better model.

APPENDIX B: FIGURES

Figure 1. The Extended Parallel Process Model (adapted from Witte, 1992, 1998)

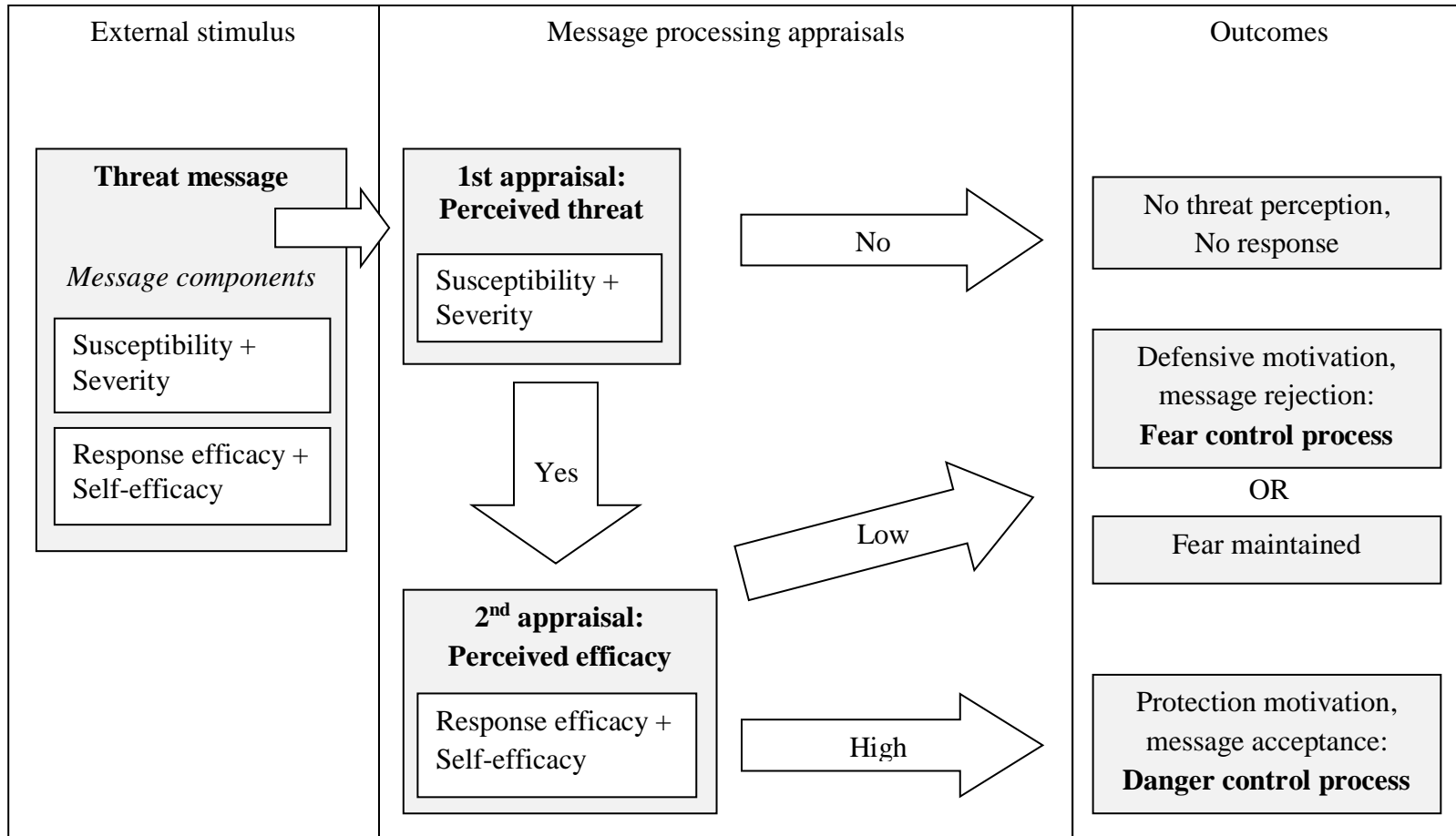


Figure 2. Conditional Process Model for Disaster Preparedness, with Sex as a Moderator (Hayes' Model 37)

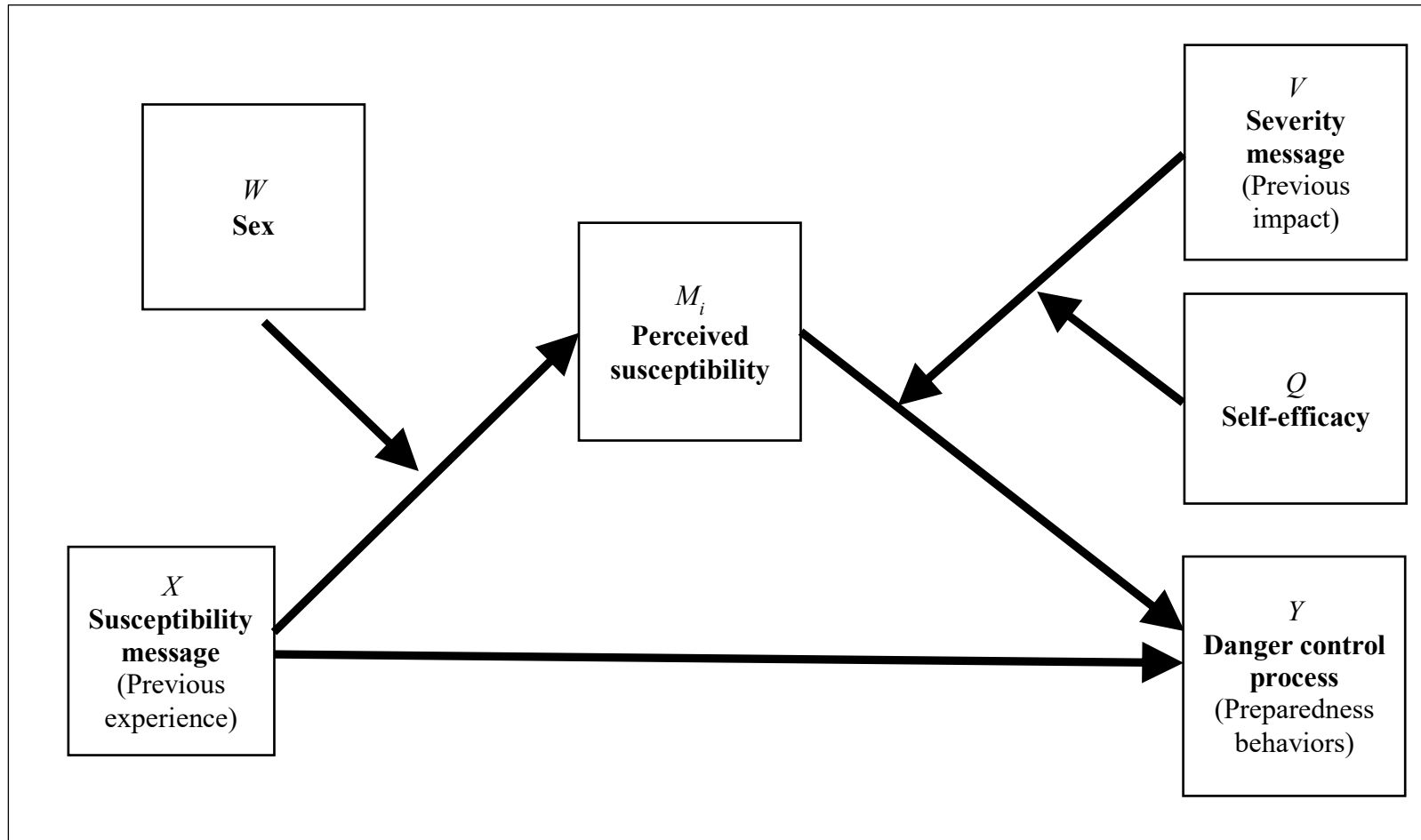
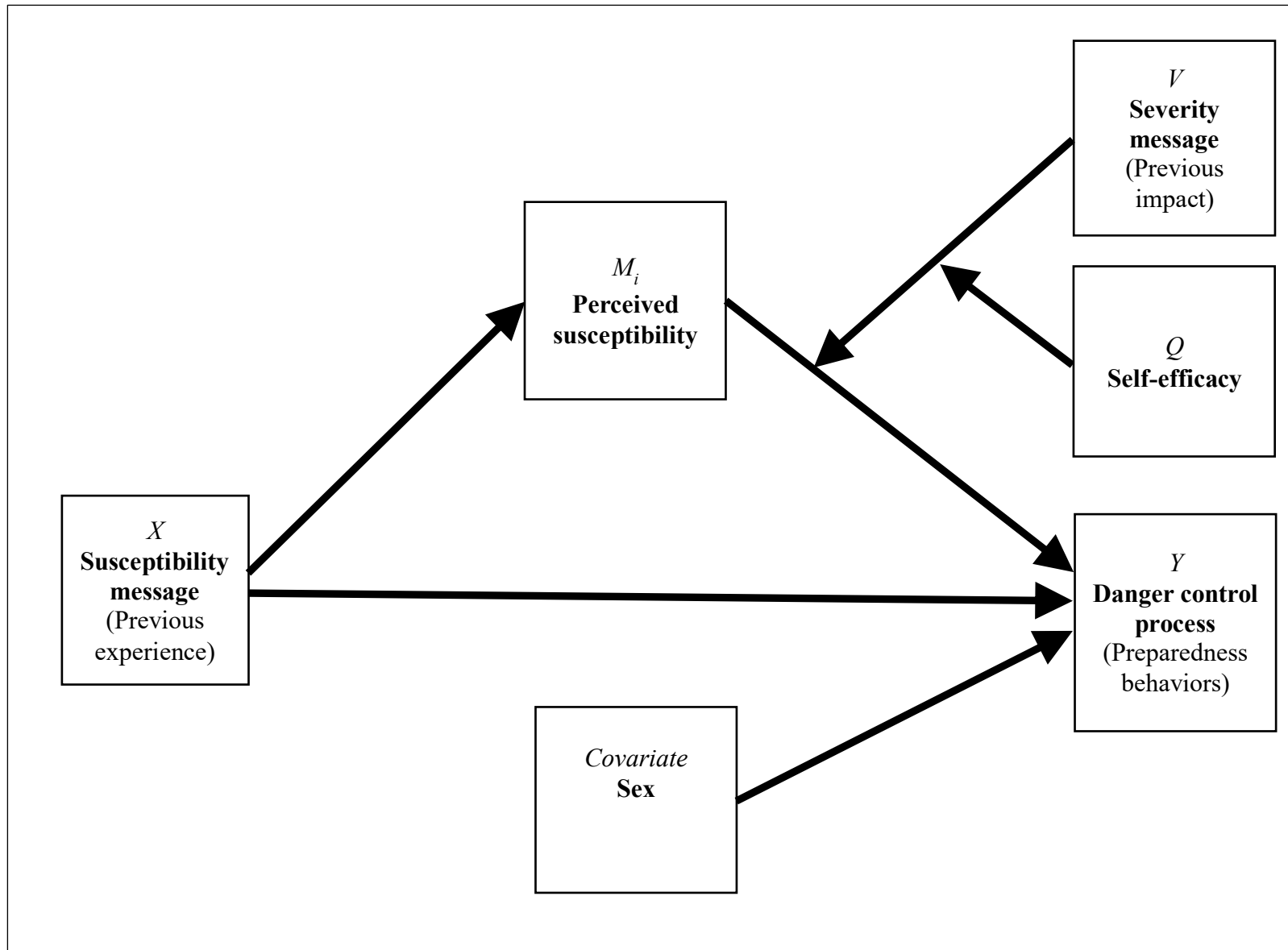


Figure 3. Conditional Process Model for Disaster Preparedness, with Sex as a Covariate (Hayes' Model 18)



APPENDIX C:
TEXT OF THE DISASTER PREPAREDNESS SURVEY

Welcome and Demographic Questions

Ole Miss Faculty/Staff Disaster Preparedness Survey

This brief, 10-minute survey is part of a joint effort between the University of Mississippi's Clinical-Disaster Research Center (UM-CDRC) and the University's Incident Response Team (IRT). Your responses to this brief survey will help us learn about your experiences with different kinds of disasters. This information is essential in assisting the University with disaster preparedness efforts on campus.

Research studying on-campus issues affecting our University couldn't be done without your help, so we really appreciate you taking the time to participate.

To navigate through this study, please click the '>>' button at the bottom of the screen. You will not be able to go back to a previous screen.

Consent to Participate in this Survey

Description

This brief, 10-minute survey is part of a joint effort between the University of Mississippi's Clinical-Disaster Research Center (UM-CDRC) and the University's Incident Response Team (IRT). Our goal is to develop a program of research that will serve our campus and community in the event of a disaster. Your responses to this survey will help us learn about your awareness and experiences with different kinds of disasters. This information is essential in assisting the University with disaster preparedness efforts on campus. If at any time you have questions or concerns relating to this survey, please contact Dr. Stefan Schulenberg (sschulen@olemiss.edu; 662-915-3518).

Risks and Benefits

There are no anticipated risks associated with participating in this project beyond those normally encountered in daily life. Benefits associated with your participation include increased understanding of attitudes towards disaster preparedness.

Costs and Payments

The survey should take approximately 10 minutes. There are no other costs for helping us with this study.

Confidentiality

Your name will not be associated with the responses that you give. Therefore, we will not be

able to identify you from the information that we collect, and all data collected will be reported in group summaries.

Right to Withdraw

Please understand that your participation is voluntary. You may choose to discontinue your participation at any time without penalty or loss of benefits.

IRB Approval

This study has been reviewed by The University of Mississippi's Institutional Review Board (IRB). The IRB has determined that this study meets the ethical obligations required by federal law and University policies. If you have any questions, concerns or reports regarding your rights as a research participant, please contact the IRB at (662) 915-3929.

Statement of Consent

I have read the above information. By continuing to the next screen, I consent to participate in the study.

What is your age?

What is your sex?

- Male
- Female

With which ethnicity do you *most* identify?

- Black/African American
- White/Non-Hispanic
- Alaskan Native
- Hispanic/Latino
- Asian
- Pacific Islander
- Native American Indian
- Multiracial
- Other

Please note approximately how long you have been working at the University.

Please note your *primary* role with the University.

- Faculty
- Academic staff member (e.g., a department secretary, a dean)
- Non-academic staff member (e.g., a cafeteria worker, a groundskeeper)
- Other (please describe)

Please note the school, college, department, or unit where you work (e.g., College of Liberal Arts, the Law School, Physical Plant).

Vulnerability

How *likely* is it that each of the following situations will occur at Ole Miss in the *next year*?

	Not at all likely	Somewhat likely	Extremely likely
Hurricane	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Earthquake	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tornado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flooding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Severe Thunderstorm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Residential/Building Fire	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ice Storm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Blizzard/Snow Storm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
School Shooting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Terrorist Attack	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bomb Threat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Large-scale Disease	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Outbreak (e.g., Flu, West Nile Virus)

How *concerned* are you about each of the following situations occurring at Ole Miss in the *next year*?

	Not at all concerned	Somewhat concerned	Extremely concerned
Hurricane	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Earthquake	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tornado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flooding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Severe Thunderstorm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Residential/Building Fire	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ice Storm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Blizzard/Snow Storm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
School Shooting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Terrorist Attack	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bomb Threat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Large-scale Disease Outbreak (e.g., Flu, West Nile Virus)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How sure are you that you know what to do if the following situations were to occur at Ole Miss?

	I have no idea what to do	I have some idea what to do	I have a very good idea what to do
Hurricane	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Earthquake	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tornado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flooding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Severe Thunderstorm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Residential/Building Fire	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ice Storm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Blizzard/Snow Storm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
School Shooting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- Terrorist Attack
- Bomb Threat
- Large-scale Disease Outbreak (e.g., Flu, West Nile Virus)

Students may look to you for guidance during an emergency. For each of the following events, *how comfortable* do you think you would be in providing guidance to students (directing students to safety, for example)?

	not comfortable	somewhat comfortable	very comfortable
Hurricane	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Earthquake	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tornado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flooding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Severe Thunderstorm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Residential/Building Fire	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ice Storm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Blizzard/Snow Storm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
School Shooting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Terrorist Attack	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bomb Threat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Large-scale Disease Outbreak (e.g., Flu, West Nile Virus)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How confident are you that Ole Miss is prepared to deal with an emergency situation related to weather?

Not at all confident	A little confident	Fairly confident	Very confident
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How confident are you that Ole Miss is prepared to deal with an emergency situation related to on-campus violence (e.g., a shooting on campus)?

Not at all	A little
------------	----------

confident
 confident
 Fairly confident
 Very confident

How confident are you that Ole Miss is prepared to deal with an emergency situation related to a large-scale disease outbreak?

Not at all confident
 A little confident
 Fairly confident
 Very confident

How confident are you in the ability of students to respond appropriately to campus emergencies?

Not at all confident
 A little confident
 Fairly confident
 Very confident

Whose responsibility is it to educate you on the proper procedures relating to campus emergencies?

My responsibility alone
 The responsibility of both me and the University
 The University alone

How capable is Ole Miss to educate you on the proper procedures relating to campus emergencies?

Not at all capable
 A little capable
 Fairly capable
 Very capable

Imagine that an emergency situation occurred at Ole Miss. How likely would you be to follow instructions provided by the following people?

	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Very Unlikely	Unlikely	Somewhat Unlikely	Somewhat likely	Likely	Very Likely
A faculty member	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A non-academic staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

member (e.g., a cafeteria worker, a groundskeeper)

An academic staff member (e.g., a department secretary, a dean)

An officer from the University Police Department

A student

While on campus, do you have access to a first aid kit?

- Yes
 No

While on campus, do you have access to a weather radio (e.g., battery-operated or hand cranked)?

- Yes
 No

Emergency Experiences

Which of the following emergency situations have you personally experienced (i.e., you were directly affected by the experience)? Check all that apply.

- Hurricane
 Earthquake
 Tornado
 Flood
 Severe Thunderstorm
 Residential/Building Fire
 Ice Storm
 Blizzard/Snow Storm
 School Shooting

- Terrorist Attack
- Bomb Threat
- Large-scale Disease Outbreak
- Other
- None of the above

You indicated that you have experienced a weather-related emergency event (a tornado or a severe thunderstorm, for example). Which of the following have you experienced as a result of a WEATHER-RELATED emergency situation? Check all that apply.

- Saw others injured or killed
- Got injured yourself
- Felt a direct threat to your life
- Provided first aid
- Lost a significant amount of material possessions
- Could not get in touch with other family members
- Was separated from members of your immediate family
- Could not get to a store for three or more days
- Lost electricity for three or more days
- Were forced to leave your community or neighborhood due to an evacuation order
- Had to leave home for three or more days
- Had to leave work/school
- None of the above

You indicated that you have experienced a violence-related emergency event (a school shooting or terrorist attack, for example). Which of the following have you experienced as a result of a VIOLENCE-RELATED emergency situation? Check all that apply.

- Saw others injured or killed
- Got injured yourself
- Felt a direct threat to your life
- Provided first aid

- Lost a significant amount of material possessions
- Could not get in touch with other family members
- Was separated from members of your immediate family
- Could not get to a store for three or more days
- Lost electricity for three or more days
- Were forced to leave your community or neighborhood due to an evacuation order
- Had to leave home for three or more days
- Had to leave work/school
- None of the above

Information Access

The following questions are designed to help us understand how you receive information regarding weather, emergencies, etc.

How do you **PRIMARILY** receive information about bad weather occurring in Oxford (e.g., tornado warnings, flood watches)?

- I rely on RebAlert text messages
- I receive updates from a weather service (e.g., Weather.com, Accuweather) on my phone or via email
- Radio/Television Alerts (i.e., Emergency Broadcast Service)
- I use the Lafayette County alert system
- Facebook/Twitter
- Other
- I don't automatically receive information about bad weather

What would you suggest is the **BEST** way for campus-related WEATHER emergency messages to reach you?

- Television news
- Email (e.g., UM Today)
- Text messages (e.g., RebAlert)

- Ole Miss emergency web page
- Mass telephone call
- Radio station
- Emergency alert on campus (e.g., sirens)
- Facebook message
- Twitter message
- Other

What would you suggest is the BEST way for on-campus VIOLENCE-related emergency messages to reach you?

- Television news
- Email (e.g., UM Today)
- Text messages (e.g., RebAlert)
- Ole Miss emergency web page
- Mass telephone call
- Radio station
- Emergency alert on campus (e.g., sirens)
- Facebook message
- Twitter message
- Other

About how many of the UM Today messages do you read?

- | | |
|---|--|
| <input type="radio"/> All of them | <input type="radio"/> Some of them, less than half |
| <input type="radio"/> More than half, but not all of them | <input type="radio"/> None of them |
| <input type="radio"/> About half | <input type="radio"/> I do not receive UM Today messages |

About how many of the RebAlert text messages do you read?

- | | |
|---|--|
| <input type="radio"/> All of them | <input type="radio"/> Some of them, less than half |
| <input type="radio"/> More than half, but not all of them | <input type="radio"/> None of them |

About half

I do not receive RebAlert text messages

Below are some questions about some of the University's efforts to inform faculty, staff, and students.

Are you aware that the University has created a video designed to prepare faculty, staff, and students on how to respond during a shooting on campus?

- Yes
 No

Have you seen this video?

- Yes
 No

Given that you have seen this video, how effective do you think this video was in preparing you for a shooting on campus?

- Not at all effective
 A little effective
 Somewhat effective
 Very effective
 Extremely effective

Are you aware that the University posts informational signs in buildings to prepare faculty, staff, and students for emergency situations, such as tornadoes and the flu epidemic?

- Yes
 No

Have you read one of these signs?

- Yes

No

Given that you have read one of these signs, do you think this is a good way to communicate about emergency issues?

Yes

No

Thank You and Debriefing

Thank you for your participation in this study.

Please use the space below to provide us with information related to your thoughts/feelings about the University of Mississippi and emergency preparedness that you were not able to express in the questions you were asked.

Please use the space below to provide us with information related to the survey itself. Was it hard to understand? Were questions confusing? Was it too long?

This concludes the survey.

If you have any further questions or concerns about your participation in this study, feel free to contact Dr. Stefan Schulenberg (sschulen@olemiss.edu; 662-915-3518).

On behalf of the University of Mississippi's Clinical-Disaster Research Center and the University's Incident Response Team, we thank you for your help with this research. Your

participation is greatly appreciated!

Please click the >> button at the bottom of the screen to finish this survey.

VITA

EDUCATION

Doctor of Philosophy
The University of Mississippi

Expected graduation May 2019
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Bachelor of Science in Psychology
The University of the South

May 2013
Sewanee, TN

Graduated *summa cum laude* with honors in Psychology and with a Spanish minor

RESEARCH EXPERIENCE

Graduate Research Assistant, Clinical-Disaster Research Center, The Univ. of Mississippi.
(Aug. 2014 – present). Advisor: Stefan Schulenberg, PhD

- *Tornado Impact and Resilience of University Employees and Students*: co-constructed two surveys, conducted initial data analysis
- *Faculty & Staff Disaster Preparedness Survey*: Conducted a conditional process model analysis, primary author of manuscript.
- *Qualitative study of student disaster preparedness*: Mentored an undergraduate honors thesis project and co-authored a manuscript submitted for publication.
- *Meaning, Mindfulness, and Empathy*: designed and conducted a survey, and mentored undergraduate students in their contributions.
- *Assessment with Children: WISC-V and WPPSI-IV*: edited book chapters and tables
- *Dissemination of research*: developed and distributed disaster preparedness information to university students and to all faculty members

Post-Baccalaureate Research Assistant, Life Paths Research Program, The Univ. of the South.
(2013-2014). PI: Sherry Hamby, PhD

- Conducted qualitative interviews on coping, character building, resilience
- Recruited participants for and conducting surveys on character strengths and resilience
- Analyzing data on bystanders of physical, sexual, and psychological victimization
- Co-authoring two manuscripts on bystander involvement, for submission to peer-reviewed journals

Summer Research Assistant, The Child Study Center, Yale Medical School. (2013).
PI's: Linda Mayes, MD, Helena Rutherford, MD, Tamara Vanderwal, MD

- Ran EEG data collection on young adults and mothers

- Pre-processing, spectral analysis, and statistical analysis of EEG data on maternal alcohol, drug, and nicotine use
- Conducted literature searches and compiled annotated bibliographies on EEG, MRI, and substance use
- *Alpha power differences between smoking and non-smoking mothers at rest*: conducted statistics, authored and presented poster

Undergraduate Research Assistant, The University of the South. (2012-13).

PI: Helen Bateman, PhD

- *Healthy Bodies, Healthy Minds* initiative: co-created and implemented healthy eating and exercise elementary after-school programs, developed a coding scheme and coded survey data

NSF Research Experience for Undergraduates (REU) interdisciplinary internship,

Gaming and Media Effects Research Lab, Virginia Tech. (2012). PI: James Ivory, PhD

- *Reinforcing anti-violence attitudes through exposure to violent entertainment media*: Designed experiment; collected physiological, questionnaire, and behavioral data; co-authored paper submitted for publication
- *Sex-role stereotyping in an online multiplayer first-person shooter game*: Co-designed and conducted an online field experiment, managed data entry, authored and presented poster
- *Content analysis of user-generated characters*: co-developed a coding scheme for avatars in an online social network; conducted data entry

Independent study in psychological research, The University of the South. (2012).

Advisor: Sherry Hamby, PhD

- *Malleable protective factors of child abuse and intimate partner violence: A literature review*: initiated and conducted an extensive literature review of risk and protective factors, synthesized findings on malleable factors, authored poster.

Research Methods course, The University of the South. (2011). Instructor: Al Bardi, PhD

- *Professors' perceptions of academic success based on students' race and formality of clothing*: co-designed and conducted an experimental survey; managed data entry; assisted with data analysis; authored paper and poster.

PUBLICATIONS

Davis, C. L., **Weber, M. C.**, Green, J., & Schulenberg, S. E. (manuscript submitted for publication). Perceptions and Attitudes Regarding Preparedness for Campus Disasters. *The American Journal of College Health*.

Banyard, V., **Weber, M. C.**, Grych, J., & Hamby, S. (2016). Where are the helpful bystanders? Ecological niche and victims' perceptions of bystander intervention. *American Journal of Community Psychology*, 44(2), 214-231.

Hamby, S., **Weber, M. C.**, Banyard, V., & Grych, J. (2016). What difference do bystanders make? The association of victim outcomes with bystander involvement in a community sample. *Psychology of Violence* 6(1), 91-102.

PRESENTATIONS

White, K. E., Stephens, L. T., **Weber, M. C.**, Tkachuck, M., & Schulenberg, S. E. (2016, April). *Tornado preparedness of UM students*. Paper presented at the Third Annual Conference on Psychological Science, Oxford, MS.

Weber, M. C., & Schulenberg, S. E. (2015, May). *The University of Mississippi's Clinical-Disaster Research Center (UM-CDRC)*. Oral presentation at the Mississippi Preparedness Summit, Biloxi, MS.

Weber, M. C., Tkachuck, M., Weathers, L., & Schulenberg, S. E. (2015, April). *Emergency Preparedness of University of Mississippi Students*. Paper presented at the University of Mississippi Conference on Psychological Science, Oxford, MS.

Weber, M. C., Weathers, L., Tkachuck, M., & Schulenberg, S. E. (2015, April). *Emergency Preparedness of University of Mississippi Faculty and Staff*. Paper presented at the University of Mississippi Conference on Psychological Science, Oxford, MS.

Weber, M. C., Hamby, S. L., Banyard, V., & Grych, J. (2014, March). *What difference do bystanders make? Bystander involvement and victim mental health*. Oral presentation at the Southeastern Psychological Assoc. (SEPA) annual meeting, Nashville, TN.

Weber, M. C., & Hamby, S. (2014, February). *The Life Paths Research Program: Researching narrative and character development on the Cumberland Plateau*. Poster presentation for the Board of Regents at the University of the South, Sewanee, TN.

Weber, M. C., Hamby, S. L., Banyard, V., & Grych, J. (2013, November). *Characterizing bystanders of peer violence, family violence, and assault in rural settings*. Poster presented at the Tenn. Psychological Assoc. (TPA) annual meeting, Nashville, TN.

Waddell, T. F., Downs, E. P., Ivory, J. D., Akom, K., **Weber, M. C.**, & Hayspell, D. (2013, August). *Morally engaged and cognitively mixed: The prosocial effects of exposure to unpleasant media violence on charitable giving*. Paper presented to the Mass Communication and Society Division at the annual conference of the Assoc. for Educ. in Journalism and Mass Comm., Wash., DC.

Weber, M.C., Rutherford, H., & Mayes, L. (2013, July). *Alpha power differences between smoking and non-smoking mothers at rest.* Poster presented at the Yale Child Study Center undergraduate presentation, New Haven, CT.

Waddell, T. F., Fox, J., Ivory, J. D., Holz Ivory, A., **Weber, M. C.,** Akom, K., & Hayspell, D. (2013, August). *Sex role stereotyping is hard to kill: A field experiment measuring social responses to user characteristics and behavior in an online multiplayer game.* Paper presented to the Communication Technology Division at the annual conference of the Association for Education in Journalism and Mass Communication, Wash., D.C. Poster also presented at Scholarship Sewanee, Sewanee TN (2013, May).

Weber, M. C., & Hamby, S. L. (2012, Sept.) *Malleable protective factors of child abuse and intimate partner violence: A literature review.* Poster presented at the International Conference on Violence, Abuse, and Trauma, San Diego, CA. Poster also presented at Scholarship Sewanee, Sewanee TN (2012, April).

Weber, M. C., & Bardi, A. (2011, April). *Professors' perceptions of academic success based on students' race and formality of clothing.* Poster presented at Scholarship Sewanee, Sewanee, TN.

CLINICAL EXPERIENCE

Baptist Childrens' Village, Water Valley, MS and Independence, MS (August 2016 – present)

- Provide individual behavioral and strengths-based therapy for children and youth, with a caseload of 12 clients

Head Start Centers, Coldwater, MS, Oxford, MS, and Slayden, MS (September 2016 – present)

- Work with teachers to develop behavior support plans for preschool children
- Conduct mental health evaluations for over 30 classrooms
- Provide consultation and referrals for children with behavioral health problems
- Conduct workshops on early childhood behavior and classroom management

Graduate Therapist at the Psychological Services Center, Oxford, MS (March 2015 – present)

- Provide individual behavior therapy and strengths-based interventions for children and adults, with a caseload of 3-4 clients at a time.
- Lead cultural adjustment group for female international students (August 2016-present)

Education & Research Intern, The Baddour Center, Senatobia, MS (July 2015 – July 2016)

- Provided individual behavior therapy for adults with intellectual and developmental disabilities, with a caseload of 5-6 clients at a time
- Conducted two social skills groups for adults with intellectual and developmental disabilities
- Conducted dementia screener assessments and Tardive Dyskinesia assessments

HONORS AND AWARDS

Undergraduate Awards

Dean's List all collegiate semesters (requires minimum GPA of 3.625).

Honor Society inductions:

- Phi Beta Kappa (national, 2013)
- Psi Chi (international, for Psychology, 2011)
- Sigma Delta Pi (international, for Spanish, 2012)
- Omicron Delta Kappa (national, for Leadership, 2012)

McCrary Prize for student research in the Behavioral Sciences (2013)

Academic Honor Roll for the Southern Collegiate Athletic Conference (SCAC) or Southern Athletic Association (SAA; 2010-13).

Moving Mountains Award by All Saint's Outreach Ministries, for service to the greater Sewanee community (2013)