USING INOCULATION TO PROMOTE INTERPERSONAL DISCUSSION ABOUT EMERGENCY PREPAREDNESS

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ABSTRACT

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Following recommended evacuation procedures in a disaster situation is one of the most effective ways one can minimize the impacts of the disaster, yet many individuals do not evacuate when they should. Interpersonal discussion about mass-mediated messages has been identified as one factor that may increase the probability one will engage in an advocated behavior and could increase evacuation behavior. One of the reasons this may occur is because interpersonal discussion requires individuals to centrally process the campaign information. This study proposes that inoculation messages are one strategy that could facilitate discussion and bolster attitudes about evacuation procedures. Inoculation messages may encourage individuals to discuss the message content with others through talk as reassurance or talk as advocacy depending on the level of attitude certainty individuals experience after message exposure. These discussions, in turn, may increase attitude accessibility, attitude certainty, and involvement and may ultimately prepare individuals to respond to a disaster situation. The results suggest that attitude certainty does impact interpersonal discussion, but not in the ways predicted. Additionally, interpersonal discussion increased attitude accessibility, attitude certainty, and involvement. Furthermore, attitude certainty and involvement increased behavioral intentions to follow recommended evacuation procedures. The theoretical and practical implications of the study are discussed.

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INTRODUCTION

Disasters, crises, and emergencies happen all around us. Tornados, hurricanes, earthquakes, tsunamis, floods, fires and other natural disasters appear to be increasing in frequency and their impact on society is becoming more substantial (CBS, 2011; Pielke et al., 2008). These emergency situations pose a significant threat to the lives and livelihoods of the public. While disaster and crisis situations are inherently unpredictable and can wreak havoc on a community, there are behaviors individuals can engage in to mitigate the impact of the disaster. One of the most important emergency response behaviors individuals need to engage in during a disaster situation is to follow recommended evacuation procedures (Federal Emergency Management Agency [FEMA], 2012). Hurricanes, terrorist attacks, tornados, earthquakes, tsunamis, fires, and floods are just a few disaster situations in which it may be necessary for individuals to quickly relocate to a safer area (FEMA, 2012). Despite being exposed to information about how to protect oneself from a disaster situation, evidence suggests that many individuals are unprepared to face an emergency (Baker, 2009; Dow & Cutter, 2000; National Center for Disaster Preparedness [NCDP], 2011). As such, it is necessary to understand ways in which individuals can be persuaded to engage in self-protective behaviors, such as following recommended evacuation procedures.

Inoculation theory provides a useful framework for understanding how to prepare individuals to engage in self-protective behaviors such as following recommended evacuation procedures when needed. Inoculation theory focuses on how individuals can bolster their attitudes toward a particular target and resist future attacks on their attitudes (Compton & Pfau, 2005; McGuire, 1964; Pfau, 1997). Inoculation treatments involve alerting individuals their

attitude could be threatened and providing individuals with counterarguments and subsequent refutations to those counter arguments. This message content is used to prepare individuals to defend their attitudes when the attitudes are threatened.

Inoculation theory has not been clearly explored in the context of emergency preparedness; yet, it appears that the attitude bolstering outcomes following exposure to an inoculation treatment may be useful in preparing individuals for disaster situations. Inoculation-type messages are commonly found in disaster preparedness materials in the form of "debunking myths" (e.g., State Department of California Department of Conservation, 2007; St. Petersburg, 2010, National Oceanic and Atmospheric Administration [NOAA], 2006; Whitney, Lindell, & Nguyen, 2004), where the public is given a series of myths and those myths are subsequently refuted (i.e. counterarguments). Furthermore, Westerman, Margolis, & Kowalski-Trakofler (2010) argue that inoculation treatments may prepare individuals to respond during an emergency situation because individuals are better able to recall the emergency procedure due to the attitude bolstering effect of the inoculation message. They argue that in emergency situations, individuals may be approached by others to engage inappropriate behaviors. If individuals have already anticipated potential counterarguments to the proper behaviors, then they will be better prepared to take a stand against those inappropriate behaviors during the emergency. However, these ideas have not been thoroughly explored outside of a training context.

Until now, inoculation has primarily been examined as an intrapersonal process; however, some evidence indicates the bolstering effects of inoculation could also come from interpersonal discussion about the message (Compton & Pfau, 2004; 2009). Compton and Pfau (2004; 2009) theorize that characteristics of the inoculation treatment may facilitate interpersonal discussion about the campaign/inoculation message and the advocated behavior or attitudes,

which in turn has a bolstering effect on attitudes. Evidence from health and political communication campaigns indicates interpersonal discussion about campaign messages may enhance the adoption of campaign advocated behaviors (Southwell & Yzer, 2007). This likely occurs because when individuals talk to one another about campaign messages, they are able find support for their views (Compton & Pfau, 2009; Hornick & Yanovitsky, 2003; Hwang & Southwell, 2009; Rogers, 2003; Valente & Saba, 2001) and are also able to better process the campaign information due to the act of discussing the content with others (Eveland, 2004; Eveland & Thompson, 2006).

Emergency preparedness and evacuation situations are prime contexts for exploring discussion because decisions about behaviors such as evacuation are commonly made through social interaction between friends, family, and neighbors (Baker, 1979; Baker, 1991; Buckland & Rahman, 1999; Cordasco, 2006; Drabek & Boggs, 1968; Drabek & Stephenson, 1971; Mileti & Peek, 2002; Moore et al., 2004; Raid & Norris, 1998). Overall, the interpersonal discussion that may occur following exposure to inoculation messages about emergency preparedness behaviors such as following recommended evacuation procedures could enhance the bolstering effect of the inoculation treatment; thus, further preparing individuals to engage in the appropriate emergency response behavior.

This manuscript explores how exposure to inoculation messages can facilitate interpersonal discussion about an emergency preparedness message and the impacts the inoculation treatment and subsequent discussion have on strengthening attitudes and behavioral intentions about emergency response behaviors. Specifically, this study examines attitudes and behaviors regarding evacuation procedures during a hurricane. Emergency preparedness agencies have indicated that following recommended evacuation procedures is essential to protecting

one's self following a disaster event (American Red Cross [ARC], 2012; FEMA, 2012). However, while individuals likely believe emergency preparedness is important, many have not taken the time to prepare themselves properly (Baker, 2009; Dow & Cutter, 2000; NCDP, 2011). For example, Baker (2009) found that 40% of residents in Florida do not have a clear hurricane evacuation plan and over 50% of residents are not aware of what hurricane evacuation zone they live in. Additionally, Dow and Cutter (2000) observed that even though 80% of residents living in a mandatory evacuation zone in South Carolina believed evacuation to be an appropriate response to Hurricane Floyd, only 64% actually evacuated. Evidence repeatedly suggests that many individuals do not evacuate when necessary (Harvard Hurricane Katrina Community Advisory Group, 2006; National Geographic, 2008, Saul, 2012). It is possible the attitude bolstering effect of inoculation messages and the subsequent discussion that occurs could strengthen attitudes toward following recommended evacuation procedures and better prepare individuals to evacuate when needed.

This manuscript first provides an overview of attitudes toward emergency preparedness, explains inoculation theory, and explores the relationship between interpersonal discussion and inoculation treatments. Next, the methods of a study conducted to test the impact that inoculation treatments have on interpersonal discussion, attitude strength, and behavioral intentions to follow recommended evacuation procedures are described. Then, the results of the study are reported. Finally, the theoretical and practical implications of the results are explored.

LITERATURE REVIEW

Individuals are exposed to messages about self-protective behavior through a variety of sources and channels, such as mass media and interpersonal contact (Avery, 2010; Dash & Gladwin, 2005; Fisher, 1998; Pace & Silk, 2012), and when faced with a disaster situation, it is important for individuals to engage in the behaviors to which they have been exposed. However, while information from various sources and channels plays an important role in alerting individuals about what to do in an emergency, evidence suggests that individuals do not always engage in the necessary self-protective behaviors when faced with a disaster situation (Baker, 2009; Dow & Cutter, 2000; Baker, Broad, & Meyer, 2011; Sorenson & Vogt, 2006).

There are several reasons as to why individuals may not engage in appropriate behaviors during a disaster, even if they have been informed about what to do. Many of these reasons are structural in nature. For example, individuals may not have the resources necessary to engage in the appropriate response (Chua, Kaynak, & Foo, 2007; NOAA, 2011). Other reasons are attitudinal in nature. Individuals hold a variety of attitudes when it comes to emergency preparedness. Some individuals may experience low risk perceptions or optimistic bias regarding the occurrence of a disaster situation (Miceli, Sotgiu, & Settanni, 2008; Weinstein, Lyon, Rothman, & Cuite, 2000). These individuals may believe a disaster will not happen, will not be very severe, will not affect them personally, or will be so severe that there is not much that can be done about it. Optimistic bias can occur even if individuals have had previous experience with a natural disaster (Weinstein et al., 2000). Others, however, may have generally positive attitudes toward emergency preparedness, but may not have taken the steps necessary to prepare because, although their attitude is favorable, it is also relatively weak. This is demonstrated by the fact that individuals tend to indicate emergency preparedness is important for everyone, but have not

taken steps to prepare themselves (ARC, 2004; Baker, 2009; Dow & Cutter, 2000; NCDP, 2011). Additionally, peer and social influences may facilitate or impede decisions to engage in emergency responses (Baker, 1979; Baker, 1991; Buckland & Rahman, 1999; Cordasco, 2006; Drabek & Boggs, 1968; Drabek & Stephenson, 1971; Mileti & Peek, 2002; Moore et al., 2004, Raid & Norris, 1998). These social influences may be particularly strong when attitudes toward the emergency response are already weak.

One way to address weak attitudes toward emergency preparedness and response is through communication strategies aimed at bolstering attitudes. Attitudes toward emergency preparedness need to be strong and accessible in order to be recalled easily and acted upon during an emergency. Exposing individuals to inoculation treatments has been identified as one way to bolster attitudes about a given topic and has been identified as a potentially useful strategy in the context of self-protective behaviors following a disaster situation (Westerman et al., 2010). The following section explores the features of inoculation theory, its prerequisites, and attitudinal outcomes.

Inoculation Theory

Inoculation theory focuses on how attitudes toward a particular target can be bolstered (Compton & Pfau, 2005; McGuire, 1964; Pfau, 1997). Similar to inoculating an individual against a virus, inoculation theory suggests that if individuals are given an inoculation treatment, they will be better able to withstand future attacks on their attitudes (McGuire, 1964). Findings regarding inoculation theory have been robust and examined in a variety of contexts including health, consumer information, politics, and public relations (Banas & Rains, 2010). Specifically, inoculation research has explored topics such as legalizing marijuana, alcohol use, gun control, credit card applications, persuasion processes during political debates, and perceptions of

organizations following an organizational crisis. Typically, inoculation research is conducted at three separate time points (e.g., Pfau et al., 2003). First, participants are given a survey prior to message exposure which determines the participants' attitude toward the subject matter. From this information, individuals are divided into conditions such that they would have a favorable attitude towards the message. Several days later, participants are exposed to a message treatment specifically aimed at bolstering their attitude. The message alerts individuals that their attitude may come under attack in the future and provides content individuals can use to address potential attacks. Finally, several weeks later, attitudes are measured again and participants are provided an attack message to see how the participant responds to the attack. These studies are often conducted with college-aged students and the materials take form of either lengthy essays (e.g., Pfau, et al., 2010; Wood, 2007) or advertisements (e.g., Compton & Pfau, 2004). There is a need to continue to expand the application of inoculation to see how it can be used in a more field-based setting (Banas & Rains, 2010; Wood, 2007).

Westerman et al., (2010) suggest that inoculation theory is uniquely appropriate for exploring emergency preparedness situations. They posit that during emergency situations, individuals need to have strong attitudes in order to be able to engage in proper safety behaviors and avoid succumbing to potential peer influences that could cause individuals to second guess proper behaviors. The inoculation messages provide individuals with the content they would need to withstand negative peer influence in an emergency situation. This is similar to the logic applied to past research on inoculation theory. For example, Godbold & Pfau (2000) used inoculation messages to bolster anti-drinking attitudes in adolescents so they would able to withstand pressure to engage in drinking behaviors in the future. Despite the conceptual link between inoculation messages and emergency behaviors, these ideas do not appear to have been

empirically tested in the context of emergency preparedness. However, inoculation-like strategies have been utilized by multiple emergency preparedness organizations and publications (e.g., State Department of California Department of Conservation, 2007; St. Petersburg, 2010, NOAA, 2006; Whitney et al., 2004). It is necessary to empirically test the use an inoculation approach within the context of emergency preparedness to explore the effectiveness of such messages.

Threat

There are two major components to an inoculation treatment: threat and refutational preemption, or counter arguments. First, individuals need to feel like there is a possibility their current attitude could be threatened. This sense of threat leaves individuals feeling like their attitude is vulnerable and provides motivation to protect the attitude. Similar to the conceptualization of threat found in the risk perception literature (Brewer, Chapman, Gibbons, Gerrard, McCaul, & Weinstein, 2007; Witte, 1992), threat in the context of inoculation treatments can vary in terms of severity and susceptibility (Pfau et al., 2010). Threat can focus on the consequences that will be experienced by an attitude attack (i.e., severity) as well as the likelihood that such an attack could occur (i.e., susceptibility). While Pfau and colleagues conceptually acknowledge that threat is composed of two dimensions and research in other contexts has found that threat is composed of severity and susceptibility dimensions, the inoculation literature often treats threat as a single dimension variable (e.g., Pfau et al., 2010, Pfau et al., 2003; Wan and Pfau, 2004).

Threat generally comes from one of two sources: implicit threat or explicit threat. Implicit threat occurs when individuals feel like their beliefs may come under attack due to the realization that others disagree with them (Compton & Pfau, 2005). In this case, there is no direct

or explicit mention of the threat. Traditionally, the mere presence of the refutational preemption, or counterarguments, was seen as enough to elicit threat (e.g., Bernard, Maio, & Olson, 2003; Bohner, Eineiller, Erb, & Siebler, 2003; Cronen & LaFleur, 1977; Farkas & Anderson, 1976; McGuire, 1964; Pashupati, Arpan, & Nikolaev, 2002; Syzbillo & Heslin, 1973). These counterarguments alert individuals to the fact there are differing attitudes and this realization motivates individuals to bolster their beliefs. In the context of emergency preparedness, individuals may often come across implicit threats to their beliefs. Simply observing others not engaging in emergency preparedness behaviors or being exposed to verbal pressure to behave counter to one's beliefs could be enough to alert the individual that others hold a different attitude and cause the individual to question his or her beliefs.

Threat can also be explicit in nature. Explicit threats directly alert individuals that their beliefs will come under attack (Compton & Pfau, 2005). Explicit threat has commonly been operationalized by directly indicating others disagree with the individual's beliefs and the individual may face potentially persuasive counter arguments to his or her beliefs in the future (e.g., An & Pfau, 2004; Compton & Pfau, 2008; Pfau et al., 2010; Pfau et al., 2006; Pfau et al., 2008; Pfau et al., 2007; Pfau et al., 2000, Pfau et al., 2005). Others have operationalized explicit threat, or forewarning, to include statements about how the individual may face social pressure to engage in particular behaviors, but do not necessarily contain an explicit attempt to persuade (Godbold & Pfau, 2000; Lin & Pfau, 2007; Nabi, 2003). In the context of emergency preparedness behaviors, explicit threat could include a warning about social pressure individuals might experience to ignore or not engage in recommended evacuation procedures during an evacuation.

The evidence regarding how the level of threat impacts the success of the inoculation treatment is mixed. Early studies in inoculation research suggest both implicit and explicit threats are effective in making individuals believe their attitudes are vulnerable; however, the effect sizes may be larger when there is a combination of implicit and explicit threat (McGuire, 1964). Overall, explicit threats may yield a greater sense of threat due to their directness, while implicit threats are not direct and perhaps less obvious; thus, individuals experience a lower sense of threat. A meta-analysis revealed that level of threat did not have a significant relationship to the success of the inoculation, although the findings were in the expected direction (Banas & Rains, 2010). The authors qualified this statement by arguing that the test was underpowered due to the paucity of studies directly examining the level of threat on the success of the inoculation treatment. Overall, there is no convincing evidence to suggest one type of threat is significantly more or less successful than the other in eliciting the motivation needed to make inoculation messages successful.

Refutational Preemption

The refutational preemption provides individuals with content they can use when experiencing an attack on their attitudes. Individuals can use the refutational preemption as a springboard to begin developing their own refutations. Two common types of refutational preemptions are refutational defenses and supportive defenses. Refutational defenses take the form of counter arguments. The individual is given an argument counter to his or her attitude and then the argument is subsequently refuted. Refutational defenses expose individuals to attacks they may face in the future and give individuals practice in counter arguing, thus the individual is better prepared to face opposition in the future. For example, individuals could be presented with a statement that indicates people think “riding out” the storm is the best way to protect

one's property during a hurricane; however, evidence suggests following recommended evacuation procedures is the more effective way to protect oneself and one's family. On the other hand, supportive defenses provide information about why one should hold a particular attitude. These messages are used to bolster one's attitude toward a particular topic. For example, in the context of emergency preparedness, a supportive defense may reinforce the importance of following recommended evacuation procedures. Overall, supportive defenses provide better protection against future attacks when compared to a no message condition, but refutational defenses provide better protection than a supportive defense (Banas & Rains, 2010).

Prerequisites to Inoculation

There are two potential prerequisites, involvement and prior attitude, that may impact the success of an inoculation treatment. First, involvement may impact the success of the inoculation treatment (Pfau et al., 2004; Pfau et al., 2005; Pfau et al., 2009). Involvement refers to the extent to which individuals care about the issue and perceive the issue to be important (Thomsen, Borgida, Lavine, 1995). Evidence suggests that involvement is composed of three distinct dimensions: outcome-relevant, value-relevant, and impression-relevant involvement (Cho & Boster, 2005; Johnson & Eagly, 1989; Marshall, Reinhart, Feeley, Tutzauer, & Anker, 2008). Outcome-relevant involvement refers to the personal importance of the issue to achieving desired goals or outcomes (i.e., evacuation procedures are very important to me because I want to be safe). Value-relevant involvement focuses on the importance of the issue to one's values or core-self (i.e., I am a safe person in how I approach the world and evacuation procedures are part of my value system). Finally, impression-relevant involvement refers to the need to hold a socially acceptable attitude (i.e., I care about how others view my attitudes about evacuation procedures). Each of these types of involvement may play an important role in the adoption of self-protective

behaviors and how one responds to inoculation messages. Traditionally, inoculation research has conceptualized and operationalized involvement without specifically identifying the three dimensions of involvement (e.g., Pfau et al., 2004, Pfau et al., 2009), but Pfau et al. (2010) argue the measure of involvement typically used in inoculation studies most closely resembles outcome-relevant involvement.

One's involvement may impact how s/he responds to the inoculation treatment. Pfau, Tusing, Koerner, et al. (1997) argue when involvement is too low or too high individuals will not be motivated to strengthen their attitudes because individuals will not care that their attitude may come under attack or they will have already anticipated potential attacks. As such, inoculation treatments will work best when individuals have a moderate amount of issue involvement. Banas and Rains (2010) observed a nonsignificant quadratic effect for the impact of involvement on the effectiveness of inoculation, such that inoculation may be more successful with individuals who have moderate involvement as compared to those who have high or low levels of involvement. Two possible explanations for these findings are that the test was underpowered and current inoculation research has not specifically examined the dimensions of involvement (Banas & Rains, 2010). Similarly, Pfau and colleagues (2010) argue it may be necessary to examine the three dimensions of involvement in the context of inoculation to better understand how individuals respond to inoculation treatments. They observed that in the context of inoculation, outcome- and value- relevant involvement impacted attitude strength, while impression-relevant involvement did not. It is possible that differing levels within the three dimensions of involvement may impact the success of the treatment. Thus, it is important to explore the levels of outcome, value, and impression-relevant involvement individuals have regarding emergency

preparedness and self-protective behaviors as it may impact how individuals respond to the inoculation message and the type of discussion that may occur about the inoculation message.

RQ1: What levels of outcome-, value-, and impression-relevant involvement do individuals report about following recommended evacuation procedures?

Current attitude has been identified as a second prerequisite to inoculation. Attitude refers to the overall favorable or unfavorable evaluation one make toward a particular target (Eagely & Chaiken, 1998). For example, individuals may have a generally positive or generally negative evaluation of evacuating during a natural disaster. Traditionally, it has been assumed that individuals need to have a positive attitude toward the target behavior in order for inoculation to be successful. This assumption is based on the idea that inoculations in the medical field are given to healthy individuals; thus, in accordance with this analogy, inoculation messages will be more effective in bolstering the attitude of those already in agreement with the message. However, this assumption has not been clearly tested and is in need of further exploration (Compton & Pfau, 2005; Wood, 2007). Often times, there is little control over who would see an inoculation message in the context of a campaign. Individuals who agree, are neutral, and disagree with the message may all come in contact with the message if it is broadcast via mass media. Wood (2007) observed that individuals with positive, negative, and neutral attitudes prior to message exposure all held more supportive attitudes toward the attitude target after message exposure. Furthermore, those who held negative prior attitudes experienced greater supportive attitude change, albeit they did not become favorable of the topic, just less opposed, than those who initially held positive or neutral attitudes. Even though individuals generally have positive attitudes toward emergency behaviors (ARC, 2004, Baker, 2009; Dow & Cutter, 2000; NCDP, 2011), it is important to know current attitudes toward emergency preparedness to explore how

current attitudes may impact the success of the inoculation treatment and control for those effects.

RQ2: What is the public's attitude toward following recommended evacuation procedures?

Exposure to an inoculation message increases the likelihood that one's attitude will be able to withstand attacks (i.e. counter arguments) in the future (Banas & Rains, 2010). Two of the reasons why inoculation treatments may be successful in conferring resistance is individuals experience increased attitude strength and involvement following message exposure (Pfau et al., 2004; Pfau et al., 2005; Pfau et al., 2003). The next section explores the outcomes of inoculation treatments.

Outcomes of Inoculation

Krosnick and Petty (1995) suggest that strong attitudes are resistant to change, are stable over time, and can impact behavior. Scholars have identified several different indicators of attitude strength, including attitude importance, attitude accessibility, attitude certainty, attitude ambivalence, structural consistency, attitude extremity, and attitude intensity (Visser, Bizer, & Krosnick, 2006). In the context of inoculation research, attitude accessibility, attitude certainty, and involvement have been identified as important outcomes of the inoculation treatment (Compton & Pfau, 2004; Pfau et al., 2010; Pfau et al., 2004; Pfau et al., 2005; Pfau et al., 2003; Pfau et al., 2009).

Attitude accessibility. Attitude accessibility refers to how quickly or easily one is able to retrieve an attitude from memory (Fazio, 1995). It is assumed that when the mental link between an attitude object and an attitude is strong, the attitude will be recalled more easily than when the link is weak (Roskos-Ewoldsen, Yu, & Rhodes, 2004). Pfau and colleagues (2003; 2004)

observed that when individuals were exposed to an inoculation message, their attitudes were more accessible than those who were not exposed to an inoculation message. This may occur because the inoculation treatment causes individuals to spend more time thinking about their attitudes (Pfau et al., 2003), which strengthens the link between the attitude object and the attitude (Petty & Cacioppo, 1986). Thus, if individuals spend more time thinking about emergency response behaviors, such as following recommended evacuation procedures, they will likely make their attitudes more accessible. Furthermore, individuals are more likely to behave in accordance with attitudes that are accessible (Fazio, 1995; Roskos-Ewoldsen, 1997). Thus, when faced with a disaster situation, individuals may be better equipped to address the disaster when their attitudes toward the necessary self-protective behavior are accessible. Given this:

H1: Individuals exposed to an inoculation treatment about following recommended evacuation procedures will experience greater attitude accessibility about the behavior compared to individuals who did not receive an inoculation treatment.

H2: Attitude accessibility will be positively related to behavioral intentions to follow recommended evacuation procedures.

Attitude certainty. A second outcome of inoculation treatments is attitude certainty. Attitude certainty refers to the amount of confidence an individual has about an attitude (Visser et al., 2006). Petrocelli, Tormala, and Rucker (2007) suggest attitude certainty can be further conceptualized in terms of attitude clarity and attitude correctness. *Attitude clarity* refers to whether individuals think their attitudes are a true representation of what they believe. Individuals with attitude clarity have a strong understanding of their attitudes toward a given target. The attitude is clear in the mind of the individual. In the context of emergency preparedness, individuals with attitude clarity would be confident they know what they believe

about following recommended evacuation procedures. *Attitude correctness* refers to whether individuals are confident their attitudes are valid and are the attitudes that should be held by others. Individuals with high levels of attitude correctness believe they hold the correct attitude and that others should also hold that attitude. In the context of emergency preparedness, individuals with a strong sense of attitude correctness would believe their attitude toward following recommended evacuation procedures is the proper attitude everyone should have. Pfau and colleagues (2003; 2004; 2005; 2009; 2010) have consistently observed that exposure to inoculation treatments increases attitude certainty. It is posited this occurs because individuals are motivated to strengthen their attitudes due to the threat and refutational preemption components of the inoculation treatment. Individuals use the inoculation messages to reinforce their attitudes and become more certain of their beliefs. However, it is important to note that Pfau and colleagues typically use a one-item global measure of attitude certainty that does not differentiate between attitude clarity and attitude correctness.

Attitude certainty is an important construct in the context of emergency preparedness because when individuals feel certain in their attitudes, they are more likely to behave in accordance with their attitudes (Gross, Holtz, & Miller, 1995; Tormala & Petty, 2002). Thus, when attitudes are certain, individuals may be better prepared to act on those attitudes during a disaster, a time when taking appropriate actions is potentially life-saving. Given this:

> H3: Individuals exposed to an inoculation treatment about following recommended evacuation procedures will experience greater attitude certainty (clarity and correctness) about the behavior compared to individuals who did not receive an inoculation treatment.
>
> H4: Attitude certainty (clarity and correctness) will be positively related to behavioral intentions to follow recommended evacuation procedures.

Involvement. Involvement has also been observed as an outcome of inoculation (Pfau et al., 2004; Pfau et al., 2005; Pfau et al., 2009). After exposure to inoculation treatments, an individual is likely to experience increased involvement. However, previous studies in inoculation have not examined how the inoculation treatment specifically affects the three dimensions of involvement, as Pfau and colleagues traditionally used an involvement scale that did not differentiate the three dimensions. Thomsen et al. (1995) argues that involvement can increase when individuals are motivated to carefully think about their attitudes, but it is unclear how each dimension of involvement is uniquely affected. It is possible the inoculation treatment could impact each dimension of involvement due to the self-reflective process that takes place following inoculation. For example, as individuals are carefully processing and thinking about their attitudes toward following recommended evacuation procedures as a result of the inoculation treatment, they could also be reassessing how following evacuation procedures is tied to their goals, values, and the social acceptability of the attitude. It is necessary to understand how each dimension of involvement is differentially affected by the inoculation treatment in order to better understand the relationship between inoculation and involvement.

Furthermore, the three dimensions of involvement may be related to behavior (Cho & Boster, 2005; Marshall et al., 2008). When individuals believe an issue is important to their goals, tied to their values, and important to their social groups, they will likely be more inclined to engage in behaviors related to those attitudes. Marshall et al., (2008) observed that high levels of outcome-relevant involvement and value-relevant involvement consistently predicted intentions to engage in health behaviors across six different topics, while impression-relevant involvement did not generate significant effects. It was proposed that impression-relevant involvement may not have been important to the health issues studied, and thus null results

would be expected. However, given emergency preparedness behaviors, such as decisions to evacuate, largely occur in social situations (Baker, 1979; Baker, 1991; Buckland & Rahman, 1999; Cordasco, 2006; Drabek & Boggs, 1968; Drabek & Stephenson, 1971; Mileti & Peek, 2002; Moore et al., 2004, Raid & Norris, 1998), it is possible that impression-relevant involvement could also be indicative of behavior. Because evacuations are social in nature, individuals may have a need to hold socially acceptable attitudes and this need may drive behavior. Other behaviors, such as STD screening would be a more personal behavior, thus one's level of impression-relevant involvement would not be important. Overall, if individuals have high levels of outcome-, value-, and impression relevant involvement regarding emergency preparedness behaviors, they may be more likely to engage in those behaviors. Thus:

RQ3: How does exposure to an inoculation treatment about following recommended evacuation procedures impact outcome-, value-, and impression-relevant involvement?

RQ4: How are outcome-, value-, and impression-relevant involvement related to behavioral intentions to follow recommended evacuation procedures?

The effects of inoculation have largely been examined at the intrapersonal level (Compton & Pfau, 2009). Inoculation studies are typically conducted longitudinally where participants are given the inoculation treatment and then exposed to an attack message several days or weeks later (e.g., Pfau et al., 2010; Pfau et al., 2004; Pfau et al., 2000; Pfau et al., 2005; Pfau et al., 2003; Pfau, Tusing, Koerner, et al., 1997; Pfau, Tusing, Lee, et al., 1997). Given that inoculation is a process that occurs over time, it is possible individuals discuss the inoculation treatment with others and this discussion contributes to the impact of inoculation. It is unclear how much of the effect seen in inoculation research is due to intrapersonal processing of the message or interpersonal discussion that could have occurred between the different phases of an

inoculation study. Compton and Pfau (2009) suggest there are several features of the inoculation process that may facilitate interpersonal discussion about the inoculation treatment. In turn, this discussion could continue to strengthen attitudes, involvement, and behavior intentions. The following section examines how inoculation may spur interpersonal discussion about emergency preparedness messages.

Interpersonal Discussion and Inoculation

Interpersonal discussion is a goal-directed interaction between an individual and at least one other person (Southwell & Yzer, 2007; 2009). Interpersonal discussion occurs when the individuals are interdependent and there is an intent to gain or share information with one another (Dainton & Zelley, 2004). In the context of emergency preparedness, interpersonal discussion about self-protective behaviors, such as evacuation procedures, is likely to occur between those in the individual's close social network (Mileti & Peek, 2002). This network likely includes family members, close friends, and neighbors. Such communication can occur through a variety of channels including face to face communication and electronic communication such as social media, email, and telephone. Interpersonal discussion about a campaign message is one factor that may influence attitudes and behavior adoption (Atkin, 2001; Noar, 2006; Rogers & Storey, 1987; Snyder et al., 2004).

Interpersonal discussion about campaign messages has been linked to attitude change and behavior adoption in a variety of health communication and political campaign contexts. Interpersonal discussion has been related to strengthened attitudes against smoking and reduced smoking intentions and behaviors (Dunlop, 2011; Hafstad & Aaro, 1997; van den Putte, Yzer, Southwell, de Bruijun, & Willemsen, 2011), increased hand washing (Botta, Dunker, Fenson-Hood, Maltarich, & McDonald, 2008), increased safe sex behaviors (Boulay, Storey, Sood,

2002; Sood & Nambir, 2006; Valente & Saba, 2001), and increased organ donation sign-ups (Harrison, Morgan, King & Williams, 2011). Furthermore, interpersonal discussion has been related to increases in the attention paid to political campaign issues (Druckman, 2004), increases in political knowledge (Eveland, 2004; Eveland & Thomson, 2006; Scheufele, 2000), and increases in political participation (Hardy & Scheufele, 2005; Scheufele, 2000; 2002). In all of these instances, having a conversation within one's social network created positive attitudes, and ultimately the adoption of the desired campaign behavior. A similar sort of finding would be expected in the context of emergency preparedness. If individuals talk to others about evacuation procedures, they may be more likely to follow through with those behaviors during an evacuation.

Compton and Pfau (2004; 2009) suggest interpersonal discussion about the inoculation treatment may have an impact on the bolstering affect of the treatment on attitudes. Traditionally, inoculation has primarily been examined as an intrapersonal process in which individuals are exposed to an inoculation treatment followed by a subsequent "attack" on the attitudes a few days or weeks later. It is assumed individuals process information provided by the threat and refutational preemptions internally. However, exposure to an inoculation treatment may also motivate individuals to talk about the inoculation message with others (Compton & Pfau, 2004; 2009). For example, Compton and Pfau (2004) observed that when individuals were exposed to strong counter arguments and refutations about negative credit card behaviors, participants were more likely to talk to others about the negative aspects of credit cards. This study suggested that interpersonal discussion could follow exposure to an inoculation message, but the study did not specifically examine interpersonal discussion or its underlying mechanisms. It is possible that some of the effect inoculation treatments have on attitudes comes from the interpersonal

discussion individuals have with their social networks following message exposure. Compton and Pfau (2009) argue that inoculation treatments can facilitate discussion in one of two ways: talk as reassurance and talk as advocacy depending on the level of attitude certainty one experiences following exposure to the inoculation treatment.

Inoculation and Attitude Certainty

Individuals may appraise their level of attitude certainty following exposure to an inoculation treatment. Following message exposure, individuals may experience a sense of low attitude certainty or high levels of attitude certainty (Compton & Pfau, 2009). Low levels of attitude certainty (i.e. attitude uncertainty) may occur because individuals realize there may be an impending attack or threat to their beliefs and that others do not necessarily agree with them. This calls into question the clarity and correctness of the attitude. Individuals may question whether they truly know their attitude and whether the attitude they hold is the correct attitude to have when they realize, through the inoculation treatment, that others hold differing attitudes thereby experiencing a low level of attitude certainty.

Alternatively, individuals could experience high levels of attitude certainty following message exposure due to the reinforcement of one's attitude provided by the threat and refutational preemption. Individuals may feel more confident in their attitude clarity and correctness after viewing the inoculation message because they are able to use the content provided in the message to reaffirm their beliefs. As such, attitudes could become more certain.

Past inoculation studies have not directly examined how attitude certainty is directly affected by message exposure, so it is unclear which appraisal individuals will make. Thus:

RQ5: Do individuals experience low or high levels of attitude certainty following exposure to an inoculation message about following recommended evacuation procedures?

Compton and Pfau (2009) argue that individuals will engage in one of two types of discussion, *talk as reassurance* or *talk as advocacy*, depending on whether or not they experience low or high levels of attitude certainty.

Talk as Reassurance

Talk as reassurance occurs when one feels a low sense of attitude certainty due to the impending threat that the individual's attitude will come under attack (Compton & Pfau, 2009). The inoculation treatment may cause individuals to experience dissonance between their current attitude and those of others. Compton and Pfau posit when individuals experience this dissonance, they are motivated to seek out the reassurance of others through interpersonal discussion to address the clarity and feelings of correctness one experiences about his or her attitude. Overall, talk as reassurance refers to discussion that involves seeking others' opinions to find support and reassurance for one's beliefs.

Much of the literature regarding interpersonal discussion about campaign messages argues that one of the main functions of interpersonal discussion is to reduce uncertainty about the advocated behavior. It has been suggested that one of the reasons individuals engage in discussion is to ascertain the social acceptability and normality of attitudes and behaviors (Hornick & Yanovitsky, 2005; Rogers, 2003, Southwell & Yzer, 2007; Valente & Saba, 2002, Valente, Poppe, & Merrit, 1996). Individuals may address this deficit in their attitude certainty by exploring how their attitudes compare with others in their social network through talk as reassurance. Attitude clarity may be addressed through talk as reassurance because the individual

is able to talk through the attitude with others and gain insight into what his or her attitude may be throughout the conversation. Attitude correctness may be addressed through talk as reassurance because the individual can discover whether his or her attitude is in line with others in their social network.

H5: Individuals who experience low levels of attitude certainty about following recommended evacuation procedures will engage in talk as reassurance.

Prior impression-relevant involvement with the message topic may also impact whether or not one engages in talk as reassurance. As noted previously, impression-related involvement considers the need for individuals to hold attitudes that are socially acceptable (Cho & Boster, 2005; Johnson & Petty, 1989; Marshall et al., 2008). This may be particularly salient in emergency evacuations situations as Cordasco (2006) and Buckland and Rahman (1999) argue decisions regarding emergency responses such as evacuations are often made in social circles, such that individuals are more likely to evacuate when their family, friends, and neighbors choose to evacuate. Baker (1991) suggests evacuation is also more likely to occur when there is pressure to evacuate from friends and relatives. It is likely individuals who have high levels of impression-relevant involvement feel a desire to seek reassurance for their attitudes. For example, individuals with high impression-relevant involvement in regard to following recommended evacuation procedures may feel motivated to talk about such procedures with other individuals in their social network to see what they think about evacuation procedures due to the need to hold a social acceptable attitude. Thus, individuals who have high impression-relevant involvement regarding emergency preparedness procedures would be more likely to engage in talk as reassurance. As such:

H6: Impression relevant involvement in regard to recommended evacuation procedures will predict talk as reassurance.

Talk as Advocacy

Alternatively, individuals could engage in talk as advocacy if they experience high levels of attitude certainty regarding the inoculation message. Talk as advocacy is discussion that involves proselytizing or telling others about the campaign or message content. If individuals feel certain in their attitudes, they may be compelled to share their beliefs with others (Castro, 2006; Compton & Pfau, 2004; Compton & Pfau, 2009; Lin & Pfau, 2007; Morgan, 2009). Engaging in talk as advocacy is also implicit in the conceptual definition of attitude certainty. Attitude correctness suggests that individuals who experience attitude correctness feel like others should also hold the same attitude. Thus, individuals may experience motivation to convince others to hold the same attitude. Additionally, when attitudes are clear, individuals are better equipped to articulate those attitudes to others. Furthermore, McGuire (2001) argues that one of the expected outcomes of a successful persuasive campaign is for individuals to proselytize to others. Proselytizing is likely achieved when individual experience high levels of attitude certainty. Given this, it is expected that when individuals experience certainty in their attitudes toward emergency preparedness, they will engage in talk as advocacy.

H7: Individuals with high levels of attitude certainty about following recommended evacuation procedures will engage in talk as advocacy.

Finally, prior outcome- and value- relevant involvement may also spur discussion about campaign information. Individuals are more likely to discuss issues they care about (Bearnman & Parigi, 2004), which would be inherent in outcome- and value- relevant involvement. When an issue is important to achieving one's goals and is important to one's core values, there may be

motivation to share those thoughts with others. Others have found a direct link between one's involvement in the issue and discussion with others in their social network (Chung & Darke, 2006; Geise, Spangenberg, & Crowley, 1996). Thus, when individuals have high outcome- and value- relevant involvement regarding emergency preparedness behaviors, they will feel a need to discuss those behaviors with others. Given this:

H8: Outcome and value-relevant involvement in regard to following recommended evacuation procedures will predict talk as advocacy.

As noted above, inoculation treatments may facilitate talk as reassurance and talk as advocacy. Individuals will likely engage in talk as reassurance when they experience low levels of attitude certainty about following recommended evacuation procedures or have a high level of impression-relevant involvement, while talk as advocacy will occur when individuals experience high levels of attitude certainty about following recommended evacuation procedures and high levels of outcome- or value-relevant involvement. Regardless of the type of discussion that is occurring, Compton and Pfau (2009) argue that exposure to the inoculation treatment will generate some sort of discussion – whether it is talk as reassurance or talk as advocacy. Discussion occurs because the threat and refutational preemption motivate individuals to talk about the message. Thus:

H9: Individuals exposed to an inoculation treatment about an emergency response behavior will engage in more interpersonal discussion (either type) than those who do not receive the inoculation treatment.

While exposure to the inoculation treatment may facilitate interpersonal discussion about the following recommended evacuation procedures, discussion may also impact an individual's

attitude toward the behavior. The following section examines how interpersonal discussion contributes to attitude accessibility, attitude certainty, and involvement.

Outcomes of Interpersonal Discussion

The act of interpersonal discussion, regardless of the type of discussion, may continue to enhance the effects of the inoculation treatment and result in greater attitude accessibility, attitude certainty, and involvement. This occurs because discussion with others about mediated information facilitates central processing of the campaign information (Eveland, 2004; Eveland & Thompson, 2006). The elaboration likelihood model (ELM, Petty & Cacioppo 1986) posits that individuals can process information in one of two ways: centrally and peripherally. Central processing occurs when the individual carefully evaluates the messages while peripheral processing occurs when the individuals rely on heuristics to evaluate the message. Central processing requires individuals to generate their own thoughts about the message content (Petty & Wegner, 1999) and the attitudes generated by central processing tend to be more resistant to change (Petty, Haugtvedt, & Smith, 1995).

Central processing likely occurs when individuals anticipate discussion with others and when individuals are engaging in the conversation. For example, Eveland (2004) observed that individuals are motivated to carefully process information they have received from the media when they anticipate they will be speaking with someone about the information. Furthermore, the very act of engaging in discussion about information from the media forces individuals to engage in central processing during the discussion (Eveland, 2004; Eveland & Thomson, 2006 McLeod et al., 1999). Thus, thinking about engaging in conversation about following recommended evacuation procedures and actually engaging in those conversations may cause individuals to centrally process the information.

Individuals who engage in central processing are likely to experience increased attitude accessibility, attitude certainty, and involvement (Chaiken, Pomerantz, & Giner-Sorolla, 1995; Petty et al., 1995). For example, Fazio (1995) found the more often an attitude is recalled, the more accessible the attitude becomes. It is expected that as individuals talk and carefully think about their attitudes, the stronger the connection will become between the evaluation and the attitude object, thus increasing attitude accessibility. Similarly, attitude certainty should also increase following interpersonal discussion. When individuals carefully think about an issue, as would result from engaging in discussion, they are more likely to experience greater attitude certainty when compared to individuals who are not able to carefully process information (Smith, Farbrigar, MacDougall, & Wiesenthal, 2008).

Finally, it is important to understand how the three dimensions of involvement impact interpersonal discussion. It is unclear how the central processing of information provided through discussion affects the three dimensions. It is possible that outcome- and value- relevant involvement could increase in strength following inoculation due to the self-reflective process inherent in having discussion. This is similar to the idea that individuals who verbally give an argument versus having to read the argument quietly will experience greater attitude change in favor of the topic (Janis & King, 1954; King & Janis, 1956). Impression-relevant involvement may also increase because the discussion highlights the social importance of the issue. Thus:

H10: Interpersonal discussion (either type) about following recommended evacuation procedures will increase attitude accessibility and attitude certainty.

RQ6: How does interpersonal discussion (either type) about following recommended evacuation procedures impact outcome-, value-, and impression- relevant involvement?

Summary

The present study seeks to understand how exposure to inoculation treatments and subsequent interpersonal discussion facilitated by inoculation message exposure may prepare individuals to respond during a disaster situation. Evidence suggests that exposure to inoculation messages about self-protective behaviors may bolster attitudes toward engaging in self-protective behaviors. When presented with an inoculation message, individuals may experience high or low levels of attitude certainty. If individuals experience a low level of attitude certainty following exposure to an inoculation message, they may engage in talk as reassurance to seek verification of their beliefs. It is also expected that impression-relevant involvement may predict talk as reassurance due to a need to hold socially acceptable attitudes. However, when individuals experience high levels of attitude certainty following exposure to an inoculation message, they may engage in talk as advocacy to proselytize to others. Outcome-and value- relevant involvement may also predict talk as advocacy due to a need to share important attitudes with others. These discussions, both talk as reassurance and talk as advocacy, may facilitate central processing of the campaign content and may enhance attitude accessibility, attitude certainty, involvement, and ultimately behavioral intentions to engage in the self-protective behavior when needed. A conceptual model is presented in Figure 1 and a table of conceptual definitions of key constructs is available in Table 1.

METHOD

The purpose of this study is to examine how inoculation treatments facilitate interpersonal discussion about emergency response behaviors and how that discussion can enhance attitude accessibility, attitude certainty, involvement, and behavioral intentions to engage in the self-protective behavior. The study was conducted in the context of hurricane preparedness. Knowing appropriate evacuation procedures when one lives in a hurricane prone area is considered to be a key behavior to protect oneself (FEMA, 2012); however, evidence suggests many people are not fully prepared to evacuate nor are they aware of proper evacuation procedures (Baker, 2009).

Pretesting

The measures were pretested with an online survey of 171 students at a large Midwestern university. Because this was not the target population of the study, participants were instructed to answer as if they lived in a hurricane area and some of the items were slightly reworded to reflect these instructions. Participants reported their current attitudes, attitude accessibility, involvement, and behavioral intentions. Then, half of the participants viewed the inoculation message and half of the students did not. The inoculation message stated that others may provide persuasive arguments as to why one should not follow recommended evacuation procedures which could have implications for their safety and provided two myths that individuals may face in regard to following recommended evacuation procedures and refutations to those arguments. These refutational preemptions took the form of facts directly refuting the myths.

Next, participants responded to the induction checks, reported their level of attitude certainty, and were asked if they had intentions to engage in talk as reassurance or talk as advocacy. Current attitudes, attitude accessibility, involvement, behavioral intentions, attitude

certainty, talk as reassurance, talk as advocacy, and the preemptive refutation induction check appeared to have acceptable reliability and validity. Through confirmatory factor analysis, it became apparent that the threat induction check was composed of two factors: susceptibility and severity. Thus, it was important to examine these two separate factors when analyzing the threat induction. Past research on threat has indicated threat is made up of two dimensions: severity and susceptibility (Brewer et al., 2007, Witte, 1992); however, past inoculation research has not treated threat as having two dimensions (e.g., Pfau et al., 2010, Pfau et al., 2003; Wan and Pfau, 2004). There was a significant difference between the message condition (M = 4.44, SD = 1.41) and the control condition (M = 3.66, SD = 1.49) for susceptibility (t (169) = 3.50, $p < .01$, 1 = low susceptibility, 7 = high susceptibility), but there was not a significant difference between the two conditions for severity (Message: M = 4.24, SD = 1.22, Control: M = 4.05, SD = 1.43, t (169) = .91, $p > .05$, 1 = low severity, 7 = high severity). Messages were revised with a focus on severity by increasing the intensity of language used in the message and adding two additional "Facts" that pointed out the harm of not evacuating. Furthermore, several additional items for severity were added to the induction check scale.

A second pretest focusing on the message induction was conducted using a paper/pencil survey with 54 additional students from the same Midwestern university. Participants were randomly assigned to either the control or message condition. Participants viewed the brochure (or did not view the brochure) and responded to the induction check items. There was no difference between the message (M = 4.21, SD = 1.33) and the control (M = 3.79, SD = 1.27) conditions for susceptibility (t (52) = -1.19, $p > 05$). There was also no difference between the conditions for severity (Message: M = 5.21, SD = 1.03, Control: M = 4.78, SD = 1.52, t (52) = -1.21. $p > .05$). In both cases the means were in the expected directions, so it was suspected that

the lack of difference was likely due to low power and perhaps a lack of realism because the pre-test participants did not live in a geographic area with hurricanes. A few additional items for susceptibility and severity were added to the scale and a third pretest of the message was conducted.

To increase the potential realism of the message for participants a third pretest was conducted online with 64 students attending a medium-sized university in Central Florida. Those in the message condition (M = 5.99, SD = .99) were more likely to perceive the threat to be severe than those in the control condition (M = 4.17, SD = .97, t (64) = -3.40, $p < .01$). There was no difference in the conditions for susceptibility, yet again the means were in the expected direction (Message: M = 3.67, SD = 1.76; Control: M = 3.21, SD = 1.66, t (64) = 1.05, $p > .05$). Given the significant findings for susceptibility from the first pretest, the probable bias of the student samples, and the low power from the second and third pretests, it was determined that it would be prudent to proceed with the main study.

Participants

Three hundred participants living in Florida participated in the study[1]. Participants were recruited using the survey research company, Qualtrics. Potential participants were invited by Qualtrics to sign up to be part of a panel that is emailed survey research. The panel is representative of the general population. Those who voluntarily signed-up to be a part of the

[1] It was determined that 300 matched responses were needed to achieve power for the analysis used in this study, and thus funding was secured for the purchase of 300 matched responses. 950 participants participated in Time 1 and the first 600 of these responses were included in the dataset. From these 600 responses, 350 individuals participated in Time 2 of the study. Of these 350 responses, the first 300 were included in the dataset. For the purpose of this study, only those with a matched response from Time 1 and Time 2 were included in the analysis.

panel were sent an invitation to participate in the study and had the opportunity to accept or decline the invitation.

Approximately 47% of the participants were male and 52% of the participants were female. The average age of the participants was 47 years old (*SD* = 16.15). Seventy-five percent of the participants were Caucasian, 9.7% were African American, 8.7% were Hispanic/Latino, and 2.7% were Asian/Pacific Islander. Approximately 55% of the participants were married, 4.7% were single, 26.1% were widowed, and 14.3% were divorced or separated. Thirty-two percent of the participants had a college degree, and 29.3% of the participants had attended some college. Twenty-three percent of the participants were retired and 16.7% of participants had an occupation that involved emergency preparedness. Approximately 28% of participants had an average yearly income of less than $30,000 and 40% had an average yearly income of $30,000-$59,999. Sixty-seven percent of participants did not have a child 18 years or younger and 57.8% did not have a child over the age of 18. Thirty percent of the participants are the primary caregivers of a child, 7.4% are the primary caregiver of a disabled individual, and 5.4% are the primary caregiver to an elderly individual. All participants resided in Florida and represented many counties throughout the state. Twenty percent of the participants either did not indicate or provided an unusable response (i.e. United States) when ask for their county of residence.

The average number of natural disasters experienced in one's lifetime was 3.58 (*SD* = 4.10) and the average number of natural disasters experienced in the last five years was .91 (*SD* = 1.54). The average number of emergency evacuations in which the participants engaged in the last five years was .32 (*SD* = 1.11). Approximately 30% of participants or their family experienced no major property damage as a result of a natural disaster, while 35.7% experienced

minor property damage. Eighty-eight percent of the participants or their family had never experienced injury as a result of a natural disaster.

Design and Procedure

The study utilized a longitudinal between subjects design. Participants were randomly assigned to either view an inoculation message (n = 144) or a no-message control (n = 156). No-message controls are commonly used in inoculation research (Banas & Rains, 2010). Data collection occurred at two time periods separated by two and a half weeks, and the survey was administered online. Data collection occurred in early November, one week after Hurricane/Superstorm Sandy made landfall on the East Coast. November marks the end of hurricane season in the United States.

Phase One

After granting consent, participants responded to several items measuring current attitudes toward emergency response procedures, attitude accessibility, involvement, and behavioral intentions regarding following evacuation procedures. Next, participants were either presented with an inoculation message brochure or no message. The complete inoculation message condition is available in Figure 2. The brochure encouraged individuals to follow recommended evacuation procedures. For the inoculation message, the threat component stated that others may provide persuasive arguments as to why one should not follow recommended evacuation procedures which could have serious implications for their safety. The refutational preemption provided several arguments individuals may face in regard to following recommended evacuation procedures and refutations to those arguments. These refutational preemptions were designed using a myth versus fact organizational scheme. In the control condition, no message was given. After being exposed to the messages, individuals indicated

their perceived level of threat, the presence or absence of the refutational preemption, their level of attitude certainty, and demographic information.

Phase Two

Phase two occurred two and a half weeks after phase one. Participants were asked to participate in a second online survey. This survey measured the frequency of interpersonal discussion and if the content of the discussion was talk as reassurance or talk as advocacy. Additionally, current attitudes, level of attitude certainty, attitude accessibility, involvement, and behavioral intentions were measured a second time. The survey for Phase 1 and Phase 2 is available in Appendix B.

Measures

Current Attitudes

Attitudes toward knowing evacuation procedures were measured using a scale adapted from Burgoon, Cohen, Miller & Montgomery (1978), which has consistently been used in past inoculation studies (e.g., Compton & Pfau, 2004; Pfau et al., 2010; Pfau et al., 2004; Pfau et al., 2005; Pfau et al., 2003; Pfau, Tusing, Koerner, et al., 1997; Pfau, Tusing, Lee, et al., 1997). The measure used four semantic differential items to reflect current attitudes about following recommended evacuation procedures. The adjective pairs recorded on a seven point scale were bad/good, unfavorable/favorable, wrong/right, and negative/positive. The items were aggregated to create a composite scale (Time 1: $M = 6.14$, $SD = 1.08$, $\alpha = .95$, χ^2 (2) = .75, $p > .05$, CMIN/DF = .38, GFI = .99, NFI = .99, CFI = 1.00, RMSEA = .00; Time 2: $M = 6.14$, $SD = 1.09$, $\alpha = .96$, χ^2 (2) = 6.75, $p > .01$, CMIN/DF = 3.36, GFI = .99, NFI = .99, CFI = .99, RMSEA

= .09). Additionally, there was no significant difference in the factor structure of the scales from Time 1 to Time 2 (χ^2 (7) = 21.91, $p > .01$).

Attitude Accessibility

Attitude accessibility was measured using a scale developed by Krosnick, Boninger, Chaung, Berent, & Carnot (1993), which has been used in several inoculation studies examining attitude accessibility (e.g., Compton & Pfau, 2004; Pfau et al., 2003, 2004). Two items were used to indicate how often participants think and talk about following recommended evacuation procedures in comparison to other issues (1 = not very often, 7 = very often; Time 1: *M* = 4.20, *SD* = 1.76, α = .84; Time 2: *M* = 3.89, *SD* = 1.80, α = .91). Another measure of attitude accessibility examines latency responses. In this measure, researchers determine the speed at which one is able to recall an attitude using a computer (e.g., Fazio, 1990). Krosnick and colleagues found that the two item measure used in this study is a valid proxy for the latency response approach.

Involvement

Involvement was measured using a six item scale adapted from Boninger, Krosnick, and Berent (1995) and Cho and Boster (2005) and used in Pfau et al., 2010. Participants were asked to indicate how much they agree or disagree with each statement (1 = strongly agree, 7 = strongly disagree). A sample item for outcome-relevant involvement is, "Following recommended evacuation procedures directly affects me" (Time 1: *M* = 5.31, *SD* = 1.0, α = .81; Time 2: *M* = 5.40, *SD* = 1.20, α = .85). A sample item for value-relevant involvement is, "My opinion about following recommended evacuation procedures is based on my values" (Time 1: *M* = 4.51, *SD* = 1.58, α = .93; Time 2: *M* = 4.77, *SD* = 1.49, α = .93). Finally, a sample item for impression-relevant involvement is, "Following recommended evacuation procedures has little

effect on what others think of me" (Time 1: *M* = 3.78, *SD* = 1.60, α = .80; Time 2: *M* = 3.94, *SD* = 1.55, α = .84). The scale had acceptable validity (Time 1: χ^2 (6) = 5.57, *p* > .05, CMIN/DF = .93, GFI = .99, NFI = .99, CFI = .99, RMSEA = .00; Time 2: χ^2 (6) = 9.7, *p* > .05, CMIN/DF = 1.63, GFI = .99, NFI = .99, CFI = .99, RMSEA = .05) and there were no significant differences between the factor structure of the scales from Time 1 to Time 2 (χ^2 (15) = 18.53, *p* > .05).

Behavioral Intentions

Behavioral intentions were measured using a single item created for this study (Time 1: *M* = 5.61, *SD* = 1. 40; Time 2: *M* = 5.78, *SD* = 1.29). Participants were asked to indicate how likely they would be to follow recommended evacuation procedures (1 = very unlikely, 7 = very likely).

Attitude Certainty

Attitude certainty was measured using four items adapted from Petrocelli, Tormala, & Rucker (2007). These items ascertained the perceived level of attitude correctness and clarity. A sample item for attitude clarity is "How certain are you that the attitude you have about following recommended evacuation procedures reflects your real thoughts and feelings?" (Time 1: *M* = 5.74, *SD* = 1.23, α = .92; Time 2: *M* = 5.72, *SD* = 1.08, α = .91). A sample item for attitude correctness is "How certain are you that of all of the possible attitudes you could have about following recommended evacuation procedures, your attitude is the right way to think and feel about the issue?" (Time 1: *M* = 5.54, *SD* = 1.19, α = .69; Time 2: *M* = 5.50, *SD* = 1.10, α = .68). The scales achieved acceptable validity (Time 1: χ^2 (1) = .23, *p* > .05, CMIN/DF = .23, GFI = 1.00, NFI = 1.00, CFI = 1.00, RMSEA = .00; Time 2: χ^2 (1) = 2.15, *p* > .05, CMIN/DF = 2.15,

NFI = .99, CFI = .99, RMSEA = .06) and there was no significant difference in the factor structure between Time 1 and Time 2 (χ^2 (4) = .18, p > .05).

Interpersonal Discussion

The *frequency of interpersonal discussion* was measured by asking participants how many times they talked with someone about planning for an emergency evacuation since they participated in Phase 1. The frequency of discussion was used primarily as a control measure so the focus could be on the content of discussion rather than the number of times a participant engaged in discussion. *Talk as reassurance* was measured using three items created for this study. Participants were asked to indicate how much they agree or disagree (1 = strongly disagree, 7 = strongly agree) with statements such as "I talked others about following recommended evacuation procedures to learn their opinion" (M = 5.89, SD = 1.08, α = .81). *Talk as advocacy* was measured using three items created for this study. Sample items include "I talked to others about following recommended evacuation procedures to tell them how important it is" (M = 5.50, SD = 1.22, α = .88). The two components of interpersonal discussion emerged as two separate factors (χ^2 (8) = 4.79, p > .05, CMIN/DF = .60, GFI = .99, NFI = .99, CFI = 1.00, RMSEA = .00)

Induction Checks

Perceived threat to one's attitude was measured using several semantic differential items measured on a seven points scale from past inoculation studies (e.g., 2010; Pfau et al., 2004; Pfau et al., 2005; Pfau, Tusing, Koerner, et al., 1997; Pfau, Tusing, Lee, et al., 1997) and several items created for this study. Confirmatory factor analysis indicated the items fit as two separate factors. One factor included four items related to the susceptibility of the threat (M = 3.35, SD =

1.84, α = .96) and the other factor included four items related to the severity of the threat (*M* = 4.63, *SD* = 1. 54, α = .86, χ^2 (19) = 28.04, $p < .05$, CMIN/DF = 2.00, GFI = .97, NFI = .98, CFI = .99, RMSEA = .06). For example, participants were asked if coming into contact with someone who will try to convince them to not follow recommended evacuation procedures is: Impossible/Possible or Not Worrisome/Worrisome.

The presence or absence of the *refutational preemption* was measured using two true/false items asking participants if the brochure they just viewed contained myths/facts about hurricane evacuation and reasons why someone should prepare for an evacuation.

RESULTS

Given the small number of missing values, missing values were replaced using the mean replacement method. All the scales were subject to confirmatory factor analysis and inspected for the assumptions of ANOVA and regression statistical tests. It was determined that none of the scales substantially violated the assumptions of the statistical tests used in the analysis. Correlations, descriptive statistics, and reliabilities for the measures used in this study are presented in Table 1. Age, an occupation in emergency preparedness, number of natural disasters experienced in the last five years, and numbers of evacuations in the last five years were identified as important covariates based on their correlations with the outcome variables.

Prerequisites to Inoculation Hypotheses

Research questions one and two explored current levels of involvement and current attitudes toward following recommended evacuation procedures. Outcome-, value-, and impression-relevant involvement and current attitudes as measured at Time 1 were used for this analysis. Participants appeared to have moderately high levels of outcome-relevant involvement (M = 5.31, SD = 1.30, Median = 5.50, Mode = 6.00), and moderate levels of value-relevant (M = 4.51, SD = 1.58, Median = 4.5, Mode = 4.00), and impression-relevant (M = 3.78, SD = 1.60, Median = 4, Mode = 4.00) involvement. Additionally, the public had highly favorable attitude toward following recommended evacuation procedures (M = 6.14, SD = 1.08, Median = 6.5, Mode = 7.00).

Inoculation Hypotheses

First, the induction checks were examined to see the impact the inoculation messages have on inducing perceptions of threat and the presence or absence of the refutational preemption. There was no significant difference between the message (M = 3.38, SD = 1.86) and

the control conditions (M = 3.32, SD = 1.81) for perceptions of susceptibility ($t(298) = .24$, $p > .05$). There was also no difference between the message (M = 4.79, SD = 1.47) and the control (M = 4.48, SD = 1.58) conditions for perceptions of severity ($t(298) = -1.74$, $p > .05$). Those in the message conditions were more likely to indicate they had recently viewed a brochure containing myths/facts about hurricane evacuation ($\chi^2 (2) = 176.93$, $p < .01$) and reasons why someone should prepare for a hurricane ($\chi^2 (2) = 109.68$, $p < .01$). Overall, it does not appear that exposure to the message conditions increased perceptions of threat above the control condition. Despite the lack of differences, tests were run to explore the inoculation-related hypotheses and are reported below.

Hypothesis one predicted those exposed to an inoculation treatment about following recommended evacuation procedures would experience greater attitude accessibility about the behavior as compared to individuals who did not receive an inoculation treatment. Hypothesis one was not supported. There was no difference in attitude accessibility (Time 2) between those in the message condition (M = 3.95, SD = 1.86) and those in the control condition (M = 3.84, SD = 1.75) when controlling for current attitudes (Time 1 and Time 2), attitude accessibility (Time 1), and the covariates (F (1, 291) = .46, $p > .05$, $\eta^2 = .00$).

Hypothesis three predicted those exposed to an inoculation treatment regarding evacuation procedures would experience greater attitude certainty (Time 2) about the behavior when compared to those in the no message condition. There was no difference between the inoculation message (M = 5.79, SD = 1.03) and the control condition (M = 5.66, SD = 1.11) for attitude clarity (Time 2) when controlling for attitude clarity at Time 1, current attitudes (Time 1 and Time 2) , and the covariates (F (1, 291) = .17, $p > .05$, $\eta^2 = .00$). There was also no

difference between the message condition (M = 5.64, SD = 1.05) and the control condition (M = 5.43, SD = 1.14) for attitude correctness (Time 2) when controlling for attitude correctness at Time 1, current attitudes (Time 1 and Time 2), and the covariates (F (1, 291) = .71, $p > .05$, η^2 = .00). Hypothesis three was not supported.

Research question three considered how exposure to an inoculation message impacted outcome-, value-, and impression-relevant involvement regarding following recommended evacuation procedures. The involvement scales measured in Time 2 were used as the dependent variables for this analysis. There were no significant differences between the message conditions for outcome-relevant involvement (Message: M = 5.57, SD = 1.09; Control: M = 5.24, SD = 1.27; F(1, 291) = .73, $p > .05$, η^2 = .00), value-relevant involvement (Message: M = 4.78, SD = 1.53, Control: M = 4.75, SD = 1.47; F (1, 291) = .99, p > 05, η^2 = .00), or impression-relevant involvement (Message: M = 4.00, SD = 1.60; Control: M = 3.89, SD = 1.51; F (1, 291) = .03, $p > .05$, η^2 = .00) when controlling for the involvement measures at Time 1, current attitudes (Time 1 and Time 2), and the covariates.

Research question five explored the level of attitude certainty (Time 1) individuals experience directly following exposure to the inoculation message. There was no significant difference between the message condition (M = 5.88, SD = 1.18) and control condition (M = 5.62, SD = 1.26) for attitude clarity (Time 1) when controlling for current attitude at Time 1 and the covariates (F (1, 293) = 1.66, $p > .05$, η^2 = .01). There was a significant difference between the message (M = 5.72, SD = 1.16) and control (M = 5.37, SD = 1.20) conditions for attitude

correctness (Time 1) when controlling for current attitude at Time 1 and the covariates (F (1, 293) = 3.87, $p < .05$, $\eta^2 = .03$). Thus, this hypothesis was partially supported.

Hypothesis nine explored the relationship between exposure to an inoculation message regarding evacuation procedures and engaging in interpersonal discussion about following recommended evacuation procedures. Individuals exposed to the inoculation message ($M = .74$, $SD = 1.53$) were no more likely to engage in interpersonal discussion than those who were not exposed to the inoculation message ($M = .79$, $SD = 1.55$, $F(1, 294) = 1.17$, $p > .05$, $\eta^2 = .00$) when controlling for the covariates. Hypothesis nine was not supported.

Behavioral Intention Hypotheses

Several hypotheses examined the relationship between attitudinal variables and behavioral intentions to follow recommended evacuations procedures. Tables 3-5 provide the regression coefficients for each of the hypotheses. Specifically, hypothesis two explored the relationship between attitude accessibility (Time 2) and behavioral intentions to follow recommended evacuation procedures (Time 2). Attitude accessibility ($\beta = .10$, $p > .05$) was not a significant predictor of behavioral intentions when controlling for attitude accessibility at Time 1, current attitudes (Time 1 and Time 2), and the covariates ($R^2 = .48$, $F(8, 291) = 33.34$, $p < .01$. Thus, hypothesis two was not supported.

Hypothesis four explored the relationship between attitude certainty (Time 2) and behavioral intentions to follow recommended evacuation procedures (Time 2). This hypothesis was partially supported. Attitude correctness ($\beta = .31$, $p < .01$) was a significant predictor of behavioral intentions when controlling for attitude clarity (Time 1 and Time 2), attitude

correctness (Time 1), current attitudes (Time 1 and Time 2), and the covariates (R^2 = .57, F(8, 289) = 39.28, p < .01).

Research question three examined the impact outcome-, value-, and impression-relevant involvement (Time 2) have on behavioral intentions to follow recommended evacuation procedures (Time 2). Outcome-relevant involvement (β = .23, p < .01) and value-relevant involvement (β = .10, p < .05) both significantly predicted behavioral intentions. Impression-relevant involvement (β = -.04, p > .05) did not predict behavioral intentions. Outcome-relevant, value-relevant and impression-relevant involvement (Time 1), current attitudes (Time 1 and Time 2), and the covariates were controlled (R^2 = .53, F(12, 287) = 26.85, p < .01).

Interpersonal Discussion Hypotheses

Many of the hypotheses examined the relationship the attitudinal and involvement variables had with the content of interpersonal discussion. The first set of hypotheses focused on the factors that would predict talk as reassurance. Tables 6 and 7 provide the regression coefficients for these hypotheses. Only the individuals who engaged in conversation were used in this analysis. Specifically, hypothesis five predicted that individuals with low levels of attitude certainty (Time 1) about following recommended evacuation procedures would engage in talk as reassurance. Given the high means associated with attitude certainty (Clarity: M = 5.74, Correctness: M = 5.54) and the relatively low number of individuals who engaged in conversations (88 participants), it was not logical to induce a median split and compare individuals with low and high levels of attitude certainty. Instead, multiple regression was used to explore the overall impact that attitude certainty had on talk as reassurance. Attitude correctness (β = .42, p < .01) positively predicted talk as reassurance, but attitude clarity (β = -.06, p > .05) did not (R^2 = .17, F(6, 81) = 2.73, p < .05). The covariates were controlled.

Hypothesis five was not supported; however, it is important to note that the test was underpowered due to the low number of individuals who engaged in interpersonal discussion.

Hypothesis six examined the relationship between impression-relevant involvement (Time 1) and talk as reassurance. Impression-relevant involvement (β = -.08, p > .05) was not a significant predictor of talk as reassurance, but outcome- (β = .34, p < .05) and value- (β = .33, p < .05) relevant involvement did positively predict talk as reassurance when controlling for the covariates (R^2 = .28, F(7, 80) = 4.45, p < .01). Thus, hypothesis six was not supported.

The next set of hypotheses examined the factors that predicted talk as advocacy. Tables 8 and 9 provide the regression coefficients for these hypotheses. Hypothesis seven predicted that individuals with high levels of attitude certainty (Time 1) about following recommended evacuation procedures would engage in talk as advocacy. Attitude correctness (β = .34, p < .05) positively predicted talk as advocacy, while attitude clarity (β = -.05, p > .05) did not predict talk as advocacy when controlling for the covariates (R^2 = .11, F(6, 81) = 1.61, p < .05). Overall, hypothesis seven was partially supported.

Hypothesis eight predicted that outcome- and value-relevant involvement (Time 1) regarding evacuation procedures would predict talk as advocacy. Hypothesis seven was partially supported. Outcome-relevant involvement (β = .50, p < .01) was a significant predictor of talk as advocacy, while value- (β = .13, p > .05) and impression-relevant (β = -.05, p > .05) involvement were not (R^2 = .27, F(3, 84) = 4.26, p < .01). The covariates were controlled.

The next series of hypotheses explored the impact that interpersonal discussion had on attitude accessibility, attitude certainty, and involvement. Specifically, hypothesis nine predicted that those who engage in interpersonal discussion would experience increased attitude accessibility (Time 2) and attitude certainty (Time 2). Tables 10 and 11 provide the regression

coefficients for this hypothesis. Talk as reassurance (β = .41, p < .01) and the frequency of discussion (β = .20, p < .05) predicted attitude accessibility when controlling for talk as advocacy, attitude accessibility (Time 1), and the covariates (R^2 = .40, F(8, 79) = 6.69, p < .01). Neither the frequency of discussion, talk as reassurance, nor talk as advocacy predicted attitude clarity when controlling for attitude clarity at Time 1 and the covariates (R^2 = .30, F(8, 79) = 4.18, p < .01). Talk as advocacy (β = .26, p < .05) positively predicted attitude correctness when controlling for talk as reassurance, frequency of discussion, attitude correctness at Time 1, and the covariates (R^2 = .46, F(8, 79) = 8.52, p < .01).

Research question six explored the impact of interpersonal discussion on outcome-, value-, and impression-relevant involvement (Time 2). Tables 12 and 13 provide the regression coefficients for the results. Talk as advocacy (β = .24, p < .05) predicted outcome-relevant involvement when controlling for the frequency of conversation, talk as reassurance outcome-relevant involvement (Time 1), and the covariates (R^2 = .41, F(8, 79) = 12.84, p < .01). Talk as reassurance (β = .28, p < .05) predicted value-relevant involvement when controlling for frequency of conversation, talk as advocacy, and value-relevant involvement (Time 1), and the covariates (R^2 = .39, F(8, 79) = 6.23, p < .01). Finally, none of the indicators of interpersonal discussion predicted impression relevant involvement (R^2 = .37, F(8, 79) = 5.83, p < .01)

DISCUSSION

Engaging in recommended behaviors during emergency situations is essential for individuals to protect themselves and their loved ones from harm, yet individuals often do not engage in recommended behaviors. One of the ways individuals may be encouraged to engage in recommended behaviors is through discussion with others. The purpose of this study was to examine evacuation message strategies that might facilitate interpersonal conversation about evacuation, the content of those conversations, and the impact those discussions have on attitude strength, involvement, and behavioral intentions to follow proper evacuation procedures. The study hypothesized that exposure to an inoculation message would either increase or decrease attitude certainty. If attitude certainty was low, then individuals would engage in talk as reassurance to reaffirm their beliefs. If attitude certainty was high, then individuals would engage in talk as advocacy to tell others what they believe. In turn, these conversations would result in increased attitude strength and involvement. While the inoculation treatment did not have the predicted effect on the audience, this study provided insight into the attitudes, levels of involvement, and the types of discussions individuals have about evacuations.

Prerequisites to Inoculation

In general, attitudes toward recommended evacuation procedures were highly favorable, which is consistent with past research in this area (ARC, 2004, Baker, 2009; Dow & Cutter, 2000; NCDP, 2011). Many people appear to believe evacuation is something that is necessary to consider in emergency situations. For example, 80% of individuals living in a hurricane zone following Hurricane Floyd believed the evacuation was the appropriate response (Dow & Cutter, 2000). Given these findings in relation to the null impact of the inoculation treatment, it is possible that attitudes toward evacuation procedures and emergency preparedness in general may

be too high to bolster further. Research is unclear as to the impact prior attitude has on the success of the inoculation treatment (Wood, 2007). It has been argued that inoculation works best with individuals who already have favorable attitudes toward the topic, but it is possible that if the attitude is too favorable there could be a ceiling effect.

Despite the seemingly favorable attitudes towards evacuation, there appears to be a disconnect between reported attitudes toward evacuation and actual evacuation behaviors (Baker, 2009; Dow & Cutter, 2000; Harvard Hurricane Katrina Community Advisory Group, 2006; National Geographic, 2008; Saul, 2012). Individuals in mandatory evacuation zones do not always follow evacuation procedures, even though they state that such procedures are important or appropriate (Dow & Cutter, 2000). There are several reasons why this may be a case. First, the attitudes reported in this study could have been inflated through demand characteristics and history effects. This study was conducted closely following Superstorm/Hurricane Sandy which had detrimental effects on the East Coast. Given this context and the seemingly life saving nature of evacuation, individuals could have felt a need to look favorably upon evacuation behavior. However, after time passes or when faced with a similar situation themselves, individuals may be less likely to think that evacuation would be the appropriate action. Second, while attitudes may be favorable toward evacuation procedures, it is possible that the attitudes are not strong enough to warrant action. There are multiple indicators of attitude strength (Visser et al., 2006) and only two of those indicators were explored in this study – with one indicator, attitude accessibility, being relatively low. These weak attitudes may not be a strong predictor of behavior (Holland, Verplanken, & van Knippernberg, 2002).

The moderately high level of outcome- and value-relevant involvement indicates that following proper evacuation procedures is important to the public. They appear to view this topic

as something that can have a direct effect on their ability to achieve their goals and is intricately tied to their values, especially as values such as safety and security may be primed in evacuation situations. Impression-relevant involvement on the other hand hovered slightly below the midpoint of the scale. This finding is somewhat surprising given that decisions to evacuate are often made in social settings. This moderately low level of impression-relevant involvement suggests that one's drive to maintain social desirability in this context is not a strong factor. It is possible that due to the serious nature of hurricanes and evacuations, social desirability or acceptance is not as important as one's commitment to safety and security.

Overall, the relatively moderate levels of involvement suggest that the inoculation treatment should have been successful (Banas & Rains, 2010; Pfau, Tusing, Koerner, et al., 1997). Pfau, Tusing, Koerner, and colleagues (1997) argue inoculation should be most successful when individuals have a moderate level of involvement because when involvement is too low or too high individuals will either not care that their attitude may come under attack or they will have already anticipated potential attacks. While Banas and Rains (2010) did not find significant findings to support this assertion, they argue that the findings were in the expected direction and the test was underpowered. Overall, Banas and Rains (2010) suggest that this curvilinear relationship is probable, but that more studies are needed to verify its effects. It is possible that the context of the present study limited the success of the inoculation treatment.

Inoculation

Hurricanes are a relative certainty in Florida. Nearly everyone in the sample had experienced one hurricane in the past five years and the participants had experienced an average of 3.5 hurricanes in their lifetime. On average, 1.75 hurricanes make landfall in the United States every year and 40% of these hurricanes make landfall in Florida (NOAA, 2010). An inoculation

approach strives to induce perceptions that an individual's attitude could be threatened in order to motivate individuals to bolster their attitudes. It is possible that the threat induction was not successful due to the relatively certain nature of hurricanes and evacuations in the population studied. Previous experience with hurricanes may have already taught individuals what to expect from both their close social network and evacuation procedures in general. Furthermore, even though many participants had experienced a hurricane, 87% had not experienced personal injury or had close family members suffer injury as a result of a hurricane, indicating that the harm of not evacuating may have not been realistic in the eyes of the participants. It is probable that these previous experiences with hurricanes and evacuations diluted the impact of the inoculation treatment, as most participants had not experienced serious consequences from previous hurricanes and likely would not expect to in the future. As such, inoculation-type messages may be more successful in contexts where individuals have not had much past experience with the disaster, such as earthquakes or fires. In these cases, individuals would have not had significant past experiences that could be used to inform their future expectations, thus the inoculation message may be able to induce an appropriate amount of threat.

Weinstein (1989) observed mixed results when exploring studies that examined the relationship between natural disaster experience, perceptions of future disasters, and evacuation intentions. In some instances previous experiences with natural disasters such as hurricanes, earthquakes, and volcanoes increased perceptions of future disaster severity; however, there were limited relationships between previous evacuation experience and future evacuation behavior. Weinstein does suggest that social influence may serve as a moderator in the relationship between previous experience and future behavior. Unfortunately, the current study did not measure past experiences with social influence regarding evacuation behaviors, which leads to a

lack of understanding of its impact on the inoculation treatment. Weinstein also observed that past experiences with natural disasters are not directly related to feelings of controllability. Thus, even though participants in the study had experience with hurricanes, they may not have believed that the advocated responses would actually protect them in the future, and may have not been interested in exploring messages that provided recommendations. Additionally, individuals may experience optimistic bias following exposure to a natural disaster (Weinstein, 1989; Weinstein et al., 2000). In this case, if individuals have already been affected by a major disaster, they still may not believe they could be affected by a second major disaster. Thus, the inoculation treatment may have not been successful because individuals did not believe they would be significantly negatively affected by another hurricane.

The design of the inoculation message may have also limited its success. While advertisement type messages have been used in the past (Compton & Pfau, 2004), the majority of inoculation messages involve relatively lengthy essay-like messages (e.g., Pfau, et al., 2010; Wood, 2007). This allows for the creation of strong, quality messages with the inclusion of source information, credibility cues, examples, and extended reasoning. However, from a campaign perspective, it is difficult to take such an information rich perspective in a quick message exposure. As such, many inoculation-type messages typically include a short myth/fact design (e.g., State Department of California Department of Conservation, 2007; St. Petersburg, 2010, National Oceanic and Atmospheric Administration [NOAA], 2006; Whitney, Lindell, & Nguyen, 2004). One of the benefits of this study was that it attempted to examine the effectiveness of inoculation into a more accessible form for a mass environment; however, the reduction in information richness may have worked against the induction. In the future, using a message design that utilized an extensive brochure or website format may be more effective in

inducing threat and providing content for counter arguing as these message formats are more amenable to including source information and extended reasoning.

Contrary to prior studies, exposure to the inoculation treatment did not increase attitude accessibility, attitude certainty, or involvement. Past inoculation studies have primarily examined inoculation's impact on attitude accessibility with more "hot topic" and potentially controversial subjects such as marijuana use and gun control (Pfau et al., 2003). As such, an increase in attitude accessibility may have been difficult to obtain in this context because the participants were not in a situation where they were going to immediately, or in the near future, need to rely on the information in the inoculation message. Attitude certainty and involvement, on the other hand, were already relatively high, indicating a potential a ceiling effect. Overall, all of the mean increases were in the expected direction, even though they were not significant. This suggests that if the inoculation treatment had been able to induce a greater sense of threat, there could have been larger increases in attitude accessibility, attitude certainty and involvement. Individuals did experience an increase in attitude correctness directly following message exposure, suggesting that exposure to the inoculation message could have reaffirmed beliefs, despite the fact that a significant amount of threat was not induced.

Overall, exposure to an inoculation message did not result in interpersonal discussion. However, 88 people did engage in conversation following their participation in Phase 1 of the study. Individuals who engaged in discussion were evenly split between the two conditions. This may have occurred because participation in the study primed thought about emergency preparedness and evacuation procedures which caused individuals to engage in conversation about evacuation procedures. These findings indicate that discussion about emergency

preparedness and evacuation does happen, and as such, it is a necessary phenomenon to understand.

Behavioral Intentions

Similar to past studies on attitude strength and involvement and their relationship with behavior, it was expected that attitude accessibility, attitude certainty, and all three types of involvement would increase behavioral intentions to follow proper evacuation procedures. Attitude accessibility was not a predictor of behavioral intentions. This likely occurred due the study occurring at the end of hurricane season. As with the previous findings involving attitude accessibility, the limited possibility of a hurricane occurring in the near future may have limited any potential impact or change regarding attitude accessibility.

Attitude correctness was a positive predictor of behavioral intentions, but attitude clarity was not. One of the reasons attitude clarity may not have predicted behavioral intentions is that in the context of hurricane evacuation, it does not matter whether or not one's attitude is clear or makes sense. The only factor that matters is if one believes s/he knows what s/he should do in the emergency situation. Alternatively, attitude correctness and attitude clarity may operate differently depending on the level of privacy surrounding the target behavior. Petrocelli and colleagues (2007) posit that attitude clarity may be a stronger predictor of private, personal behaviors while attitude correctness may be a stronger predictor of public behaviors. In this case, following evacuation procedures would be considered a public behavior, thus attitude correctness would be a driving factor while attitude clarity would have less of an impact. Future research should continue to explore how attitude correctness and attitude clarity relate to behavior.

Outcome- and value-relevant involvement impacted behavioral intentions to follow proper evacuation procedures, while impression-relevant involvement did not. These findings are

not surprising given the lack of relationship impression-relevant involvement had with behavior in other studies. For example, Marshall et al. (2008) found impression-relevant involvement did not have any impact on behavior across six different health contexts. Furthermore, impression-relevant involvement generally had the lowest mean score across the six contexts. It is possible that while impression-relevant involvement indicates a need to maintain social desirability within a context, this level of involvement does not have any bearing on actual behavior. Instead, individuals may primarily focus on what will protect them and what they believe is right or needed in a particular situation. Impression-relevant involvement may be a minor concern, but outcome and value-relevant involvement push the individual to act.

Interpersonal Discussion

Contrary to what was expected, talk as reassurance was primarily driven by attitude correctness and outcome- and value- relevant involvement. Overall, as one felt more correct in his/her attitude, the more likely s/he engaged in talk as reassurance. This was unexpected as it was reasoned that individuals engage in talk as reassurance to seek social reinforcement of their attitudes. If the individual feels correct in his/her attitude, then there should not be much reason to engage in talk as reassurance. It is possible that when one holds a high level of attitude correctness, s/he will always engage in discussion regardless of the content. When an attitude is considered to be correct, there may be a need or drive to talk to others about that attitude and those conversations could take the form of talk as advocacy or talk as reassurance. In other words, individuals with high levels of attitude correctness may feel a need to simply talk about their attitudes with anyone, regardless of the content. On the other hand, low levels of attitude certainty may limit all types of discussion. If individuals are not confident or certain in their

attitudes about a particular topic, they may avoid, or may be hesitant to engage in, conversation about that topic because they want to do not want to appear uninformed or vulnerable to others.

The measurement of talk as reassurance and talk as advocacy may have also impacted the results. The measurement of talk as reassurance and talk as advocacy did not explicitly take into account changes in discussion topic or who initiated the conversation. It is possible that discussions about evacuation procedures included elements of both talk as reassurance and talk as advocacy as evidenced by the high correlation between the two ($r = .90$, $p < .05$). Potentially, the discussion began with a discussion of advocacy and later included elements of talk as reassurance. Furthermore, the measurement of discussion content did not take into account who initiated or drove the bulk of the conversation. The conversation partner may have actively engaged the participant in talk as reassurance. Thus, even though the participant had a high level of attitude correctness, the conversation may have still centered around talk as reassurance due to the needs of the conversation partner.

Outcome- and value-relevant involvement also predicted talk as reassurance, while impression-relevant involvement did not. This finding was unexpected because impression relevant involvement is driven by one's need to please others in social situations (Cho & Boster, 2005). It was reasoned that if individuals desire social acceptability of their attitudes, they would engage in conversation to verify their attitudes in relation to others. It is possible that if individuals are concerned about the social acceptability of their attitudes, they may be hesitant to actively engage in discussion about those attitudes. Discussion could publicly reveal differences in opinion and highlight that the individual does not hold the socially acceptable attitude. Instead, individuals may rely on more passive information seeking strategies such as observation to verify the social acceptability of the attitude.

Another reason it was expected that impression-relevant involvement would spur talk as reassurance was that evacuation is largely considered a social behavior (Baker, 1979; Baker, 1991; Buckland & Rahman, 1999; Cordasco, 2006; Drabek & Boggs, 1968; Drabek & Stephenson, 1971; Mileti & Peek, 2002; Moore et al., 2004, Raid & Norris, 1998). Individuals evacuate when others in their close social network evacuate and when those in the social network think that evacuation is important. It is possible that the diving factor behind the social nature of evacuation is dependent on social proof rather than social norms. Social proof refers to observations that individuals make of others' behavior (Cialdini, 2001). In this case, observing others in one's social network physically evacuate would cause the individual to also engage in evacuation behaviors. Social norms refer to perceived expectations from one's social network to engage in a behavior (Kincaid, 2004). The belief that others think evacuation is important and necessary would then drive the evacuation behavior. Past research does not offer a clear differentiation between the two explanations. For example, Baker (1991) appears to take a largely normative stance when describing the impact one's social network has on evacuation behavior. Cordasco (2006), on the other hand, takes a more social proof approach to explain the impacts of social networks on evacuation behavior. Finally, Raid & Norris (1998) include both elements of social norms and social proof in their exploration of factors that influence evacuation behaviors.

Individuals would likely engage in talk as reassurance if the driving force behind evacuation was a social norm because talk as reassurance would be a way in which individuals could ascertain those norms. If social proof is the driving factor, then individuals would not need to engage in talk as reassurance, as there is not a strong need to reaffirm beliefs or gather others' opinions. The underlying mechanism of evacuation decisions could have impacted the

relationship that impression-relevant involvement has with talk as reassurance. If evacuation is largely a phenomenon of social proof, impression-relevant involvement may drive behavior to evacuate when others in the social network are evacuating, which was not explicitly measured in this study. In this case, impression-relevant involvement would not necessarily drive talk as reassurance because the social norms are not important to making evacuation decisions within the social context. A better understanding of the impact of social norms and social proof on evacuation behavior is necessary to further explore these nuances.

Outcome- and value-relevant involvement did predict talk as reassurance. This indicates that the more participants perceived following proper evacuation procedures was tied to their goals and values, the more they engaged in conversation to ascertain others' beliefs. It is possible that when a topic is considered important, individuals have a desire to better understand others' points of view. Additionally, this talk as reassurance could have preceded or have been used to initiate talk as advocacy later on in the conversation. Overall, when individuals believe that the topic is important, they may engage in all types of conversation about the issue.

Outcome-relevant involvement also predicted talk as advocacy, but value-relevant involvement did not. It was hypothesized that value-relevant involvement would also impact talk as advocacy because individuals with high levels of value-relevant involvement would strongly believe that the attitude was tied to the values they care about and would likely want to share with other people. Cho and Boster (2005) observed that value-relevant involvement is highly tied to one's level of ego involvement and self-concept. It is possible the specific values tied to the context would predict whether one engages in talk as reassurance, talk as advocacy, or both. In the case of evacuation procedures, the aspect of the self-concept or value that could have been activated is a need to care for others. If caring for others was the referent value, then the

individual may be more inclined to engage in talk as reassurance rather than talk as advocacy because talk as reassurance may been seen as less threatening to others and more caring. On the other hand, if a need for safety and security was the referent value, then individuals may have been more likely to engage in talk as advocacy to tell others what should be done to protect oneself. It may be beneficial for future research to examine the specific values individuals hold that may be related to emergency situations in order to better understand the role of value-relevant involvement.

It was expected that engaging in discussion about following proper evacuation procedures would impact attitude accessibility, attitude certainty, and involvement. Talk as reassurance predicted attitude accessibility, but talk as advocacy did not. It is likely that the content of the discussion is important for increasing attitude accessibility because the type of content discussed may elicit different types of information processing. Talk as reassurance may involve active information seeking and require further thought to differentiate between multiple opinions about the issue, while talk as advocacy may require less mental effort to the process the information. The mental effort potentially required to process talk as reassurance may induce central processing and thus increase attitude accessibility (Fazio, 1995; Smith et al., 2008).

Talk as advocacy positively impacted attitude correctness while talk as reassurance did not. This finding suggests that the more individuals talk about how others should hold a particular belief, the more certain they became in their own beliefs. This finding supports previous research that suggests the more you talk about an idea the stronger you believe the idea (Janis & King, 1954; King & Janis, 1956). Talk as reassurance, on the other hand, may have exposed individuals to many different opinions and created additional confusion for the

individual or at least did not provide enough reassurance for the individual to become more certain in his or her attitudes.

Finally, talk as advocacy predicted outcome-relevant involvement and talk as reassurance predicted value-relevant involvement. Given that talk as advocacy is more individual focused, it is possible that these types of discussions reaffirmed commitment to one's goals. For example, when individuals are telling others how important evacuation procedures are, they may be simultaneously examining the importance of the issue at a personal level. Alternatively, talk as reassurance is more social in nature, and could help individuals clarify, define, and/or experience their values. Conversation about what others think regarding evacuation procedures may simultaneously remind someone why they care about the topic.

Theoretical Implications

This study provides theoretical implications regarding the use of inoculation and its relationships with interpersonal discussion, attitude strength, and involvement. First, this study was one of the first to systematically examine the use of inoculation theory in an emergency preparedness context and one of the few studies to explore inoculation theory outside of a college student population. This is significant, because this study pushed the boundaries of inoculation theory past its primary contexts. While the results suggest inoculation messages may not be effective in a context where individuals have had substantial past experience with the target behavior, it does not exclude the use of inoculation theory in other emergency preparedness contexts. The results suggest that when individuals already have substantial experience with a behavior it may be difficult to induce enough threat to motivate attitude bolstering. Instead, inoculation may be more successful in contexts where individuals have less experience and are still forming their opinions. It is important to note, however, that while

individuals may already hold a strong stance about how to behave, that does not mean the held belief is the appropriate belief. Inoculation may be successful in strengthening beliefs about the actual recommended and appropriate behaviors if the incorrect practiced behavior is favored more than the recommended behavior.

Second, this study was also one of the few inoculation studies to explicitly explore the three dimensions of involvement. Evidence indicates that these dimensions operate differently and can have varying impacts on behavioral intentions and decisions to engage in conversation. As evidenced in previously studies, impression-relevant involvement failed to be a significant predictor or have a substantial role in influencing behavioral intentions. These results call into question the overall purpose and role of impression-relevant involvement. As such, the concept of impression-relevant involvement needs further examination, specifically in understanding under what conditions it will have an impact. If impression-relevant involvement fails to have a strong impact on behavior or strengthening attitudes (as seen in Pfau et al., 2010), it may not be necessary to include this dimension in future studies. Outcome and value-relevant involvement, on the other hand, appeared to be driving forces behind behavioral intentions and decisions to engage in discussion and were also increased by engaging is discussion. Thus, outcome- and value-relevant involvement are necessary factors to consider when understanding behavior.

Third, while the inoculation treatment did not facilitate discussion about evacuation behaviors, discussion still occurred and those discussions did have an impact on attitude strength, involvement, and ultimately behavioral intentions. This indicates that discussion does have an impact on psychological responses and behaviors. Processing of information is not just an intrapersonal process, it is also an interpersonal process, both of which can have significant impacts on the decisions individuals make. It is necessary to take both of these levels into

account in order to have a more complete understanding of an individual's decision making process and the overall impact of inoculation.

Fourth, the content of one's discussion does make a difference. Talk as advocacy and talk as reassurance had different impacts on attitude strength and involvement. Talk as reassurance increase attitude accessibility and value-relevant involvement, while talk as advocacy increased overall attitude certainty and outcome-relevant involvement. These differences may indicate that individuals process these conversations differently. These conversations may require different levels and types of processing and may reveal different types of information to the receiver; however, both types appear to be uniquely important in increasing attitude strength and intentions to engage in behavior.

Fifth, attitude correctness appeared to be a driving force behind both types of conversation and behavioral intentions to follow recommended evacuation procedures. If individuals believe the hold the correct attitude, they are more likely to talk about those attitudes, those attitudes are likely to become stronger through conversation, and those attitudes are likely to predict behavior. Attitude clarity, however, did not appear to have an impact. It is possible that attitude clarity is not important in this more public context as suggested by Petrocelli and colleagues (2007). As such, there is a need to further understand which dimensions are most effective in differing types of contests.

Finally, this study proposed a conceptual model (Figure 1). Overall, many of the links in this conceptual model were supported. It did appear that prior attitudes are an important covariate and consideration for inoculation theory and they have a significant relationship with many of the variables explored in this study. While several of the relationships were unexpected, outcome- and value-relevant involvement did predict discussion and were further increased

through those discussions. While the inoculation induction was not successful, attitude correctness did predict discussion in general. Individuals who experienced high levels of attitude correctness engaged in both talk as reassurance and talk as advocacy, indicating that attitude correctness drives both types of discussion. While dependent on the content of the discussion, discussion did increase attitude accessibility, attitude correctness, and outcome and value-relevant involvement. Ultimately, these increases in attitude correctness and outcome- and value-relevant involvement increased behavioral intentions. These findings suggest that the conceptual model is an accurate and fruitful starting point to further explore the process of discussion on increasing attitude strength, involvement and behavioral intentions.

Practical Implications

The findings and theoretical implications of this study can be translated into several important practical implications for emergency preparedness and response agencies. First, despite the unsuccessful inoculation induction, it is possible that inoculation may be effective in contexts where individuals do not have substantial past experience with the emergency response behavior such as earthquakes, floods, or fires. In these cases, individuals may not have formed expectations of their behaviors and the behaviors of those in their social network, thus may be more motivated and open to bolstering their attitudes. Emergency preparedness agencies need to make sure they are able to induce an appropriate level of threat in order to enhance the effectiveness of inoculation-types messages. Providing a list of preemptive refutations is not enough to bolter attitudes about emergency preparedness and response procedures.

Second, discussion is an important and vital outcome of emergency preparedness and response messages. As such, messages should aim to enhance attitude certainty and outcome- and value-relevant involvement to further facilitate discussion. It appears that both talk as

reassurance and talk as advocacy have different, yet complementary and substantial, impacts on attitude strength, involvement, and behavioral intentions. Thus, the type of conversation may not necessarily be important, but the act of engaging in discussion is important. Given this, it may also be beneficial to explicitly encourage the public to talk to others about emergency preparedness and response behaviors. However, this should be done with caution, as individuals could spread misinformation about the recommended behaviors. Future research should continue to explore the content of conversations about emergency preparedness and explore ways in which emergency preparedness individuals can make sure that the content of those conversations is accurate. We know that individuals talk about campaign messages and emergency preparedness and we know that those conversations can have an impact and attitude and behaviors, as such it is necessary to make sure that the correct information is being spread throughout the social network. Analyzing social media is one way this topic could be explored.

Third, it is possible that a demonstration of social proof rather than a focus on social norms may be better equipped to convince the public to engage in evacuation procedures. Simply stating that others in the social network want one to evacuate or will provide social pressure to evacuate may not be enough. Instead, demonstrating that others in one's social network, community leaders, and opinion leaders follow proper evacuation procedures may go far in encouraging others to evacuate. A purposeful combination of social proof and social norms may also be effective in encouraging evacuation behaviors.

Strengths, Limitations, and Future Research

There are several strengths and limitations to this study. One of the strengths of this study was its use of a sample drawn from the general public who were likely to experience a need for evacuation. The study also occurred shortly after Superstorm/Hurricane Sandy which could have

intensified the importance of the context in the eyes of the participants. Additionally, the study used a message that was professionally designed and modeled after other types of emergency preparedness messages. This likely increased the realism of the context for the participants, as the message could have been something they would see as part of an emergency preparedness campaign.

There are also several limitations of the study. First, the participants may have had too much experience with the context and the study occurred at the end of hurricane season. This could have limited the level of immediate susceptibility participants felt toward needing to engage in an evacuation. Additionally, the target behavior may have been too vague to get an accurate understanding attitudes and behaviors toward evacuation. The message did not allow a determination as to whether or not the participants actually knew the recommended evacuation procedure or just thought they knew the procedure, and it did not focus on specific evacuation behaviors.

Future research should continue to examine the role that interpersonal discussion has on attitudes and behaviors in emergency situations. Evidence from thus study suggests there is a relationship, but there are many nuances of this relationship that need future examination. Specifically, it is important to know what social phenomena drive evacuation behavior – social proof or social norms, as this could provide insight into the types of conversation that could or should occur. Additionally, it is necessary to continue to explore message features that could facilitate discussion, the content of those discussions, how the content of the discussion influence behavior, and how the content of the discussion can be managed and monitored for accuracy. Finally, more research is needed to examine the concepts of impression-relevant involvement and attitude clarity. Neither one of these concepts operated as expected in this study. Future

research should explore the nuances of these concepts and how they may operate in different contexts.

Conclusion

While many of the proposed relationships in this study were not supported, this study provides insight into the role that interpersonal discussion has on attitudes and involvement regarding evacuation behaviors. Interpersonal discussion increased attitude accessibility, attitude correctness, general attitude certainty, and outcome- and value-relevant involvement. As such, activating interpersonal discussion about emergency preparedness could go a long way in preparing individuals to respond appropriately during a disaster.

APPENDICES

Appendix A

Figures and Tables

Figure 1

Conceptual Model

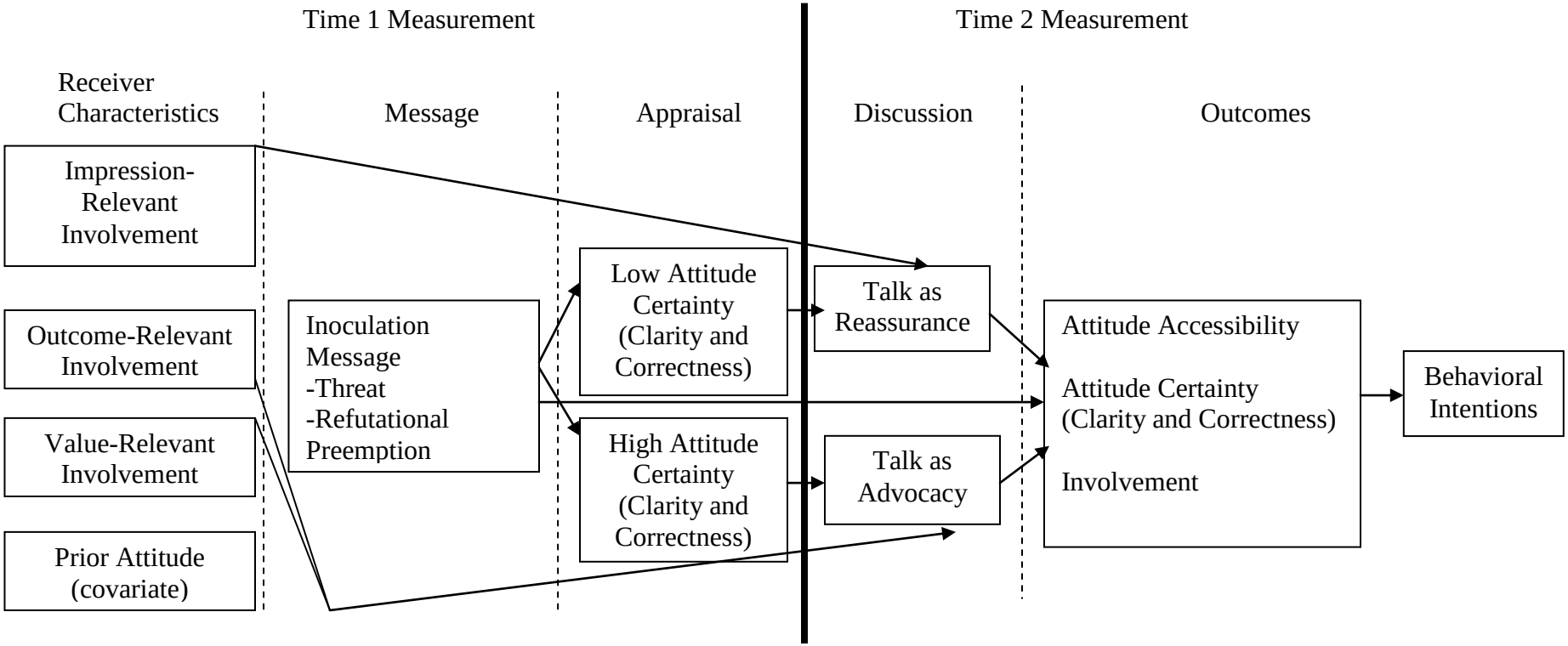

Figure 2

Inoculation Message

· Friends, family and neighbors may not believe it is necessary to follow recommended evacuation procedures during a hurricane.
· During an evacuation, they may provide persuasive arguments about why you should not follow evacuation procedures.
· They may convince you to put yourself in harm's way which leads to increased chance of injury or death.

There are many reasons why people will tell you not to follow recommended hurricane evacuation procedures:

Myth

Evacuating is not an effective way to protect yourself. You have more control over your safety and property when you stay home.

Fact

- Evacuating is considered the most effective way to prevent injury and death to you and your family.
- Staying in your home does not guarantee the safety of your property.
- Over 1,500 death and countless injuries from hurricanes have occurred in the past decade because people did not follow proper evacuation procedures.

Myth

The media over-hypes hurricanes and evacuations. It is better to wait to evacuate until you are sure the storm is coming and know how bad it is going to be.

Fact

- High-tech computers provide projections, but storms can still change quickly and be unpredictable.
- It is too late to evacuate once the storm hits.
- Injury and death are more likely to occur if you try to evacuate once the storm hits.

Follow recommended hurricane evacuation procedures to protect yourself and your family from injury and death.

Note. For interpretation of the references to color in this and all other figures, the reader is referred to the electronic version of this dissertation.

Table 1

Conceptual Definition of Key Constructs

	Definition
Current Attitude	The overall favorable or unfavorable evaluation one make toward a particular target.
Outcome-Relevant Involvement	The personal importance of the issue to achieving desired goals or outcomes.
Value-Relevant Involvement	The importance of the issue to one's values or core-self.
Impression-Relevant Involvement	The need to hold a socially acceptable attitude.
Attitude Accessibility	How quickly or easily one is able to retrieve an attitude from memory.
Attitude Certainty (Clarity and Correctness)	Attitude certainty refers to the amount of confidence an individual has about an attitude. Attitude certainty has two dimensions: ***Attitude clarity*** refers to whether individuals think their attitudes are a true representation of what they believe. ***Attitude correctness*** refers to whether individuals are confident their attitudes are valid and represent attitudes others should have.
Talk as Reassurance	Discussion that involves seeking others' opinions to find support and gain reassurance for one's beliefs.
Talk as Advocacy	Discussion that involves proselytizing or telling others about the campaign or message content.

Table 2

Correlations, Means, and Standard Deviations of Main Variables

	M (SD)	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***
1. CurrAttT1	6.14 (1.08)	(.95)								
2. CurrAttT2	6.14 (1.09)	.51**	(.96)							
3. AttAccT1	4.20 (1.76)	.29**	.33**	(.84)						
4. AttAccT2	3.89 (1.80)	.10	.29**	.59**	(.91)					
5. OutcomeT1	5.31 (1.00)	.38**	.37**	.31**	.27**	(.81)				
6. OutcomeT2	5.40 (1.20)	.24**	.40**	.32**	.35**	.62**	(.85)			
7. ValueT1	4.51 (1.58)	.16**	.15**	.39**	.29**	.35**	.28**	(.93)		
8. ValueT2	4.77 (1.49)	.05	.16**	.22**	.34**	.33**	.36**	.51**	(.93)	
9. ImpressionT1	3.78 (1.60)	.01	.05	.30**	.30**	.27**	.18**	.46**	.38**	(.80)
10. ImpressionT2	3.94 (1.55)	-.07	.06	.13*	.33**	.19**	.21**	.28**	.40**	.50**
11. ClarityT1	5.74 (1.23)	.31**	.38**	.21**	.11	.43**	.37**	.18**	.21**	-.02
12. ClarityT2	5.72 (1.08)	.28**	.40**	.19**	.12*	.35**	.45**	.17**	.34**	.01
13. CorrectT1	5.54 (1.19)	.45**	.52**	.45**	.31**	.51**	.44**	.25**	.28**	.09
14. CorrectT2	5.50 (1.10)	.37**	.57**	.39**	.35**	.50**	.55**	.27**	.40**	.14**
15. Reassurance	5.89 (1.08)	-.03	.15**	.33**	.44**	.22**	.24**	.20**	.29**	.25**
16. Advocacy	5.50 (1.22)	.00	.17**	.33**	.41**	.24**	.27**	.18**	.29**	.25**
17. BehIntT1	5.61 (1.40)	.52**	.55**	.42**	.32**	.53**	.47**	.25**	.25**	.14*
18. BehIntT1	5.78 (1.29)	.45**	.66**	.37**	.33**	.44**	.50**	.16**	.24**	.07

Table 2 (cont'd)

	10	***11***	***12***	***13***	***14***	***15***	***16***	***17***	***19***
10. ImpressionT2	(.84)								
11. ClarityT1	-.07	(.92)							
12. ClarityT2	-.01	.54**	(.91)						
13. CorrectT1	.04	.70**	.44**	(.69)					
14. CorrectT2	.11	.45**	.68**	.67**	(.68)				
15. Reassurance	.35**	.07	.06	.20**	.22**	(.81)			
16. Advocacy	.35**	.11	.07	.21**	.23**	.98**	(.88)		
17. BehIntT1	.07	.44**	.32**	.66**	.53**	.18**	.21**	1.00	
18. BehIntT1	.07	.39**	.43**	.60**	.66**	.20**	.25**	.71**	1.00

Note. * = $p > .05$, ** = $p > .01$, T1 = Time 1, T2 = Time 2, CurrAtt = Current Attitudes, AttAcc = Attitude Accessibility, Outcome = Outcome-Relevant Involvement, Value = Value-Relevant Involvement, Impression = Impression-Relevant Involvement, Clarity = Attitude Clarity, Correct = Attitude Correctness, Certainty = Attitude Certainty, Reassurance = Talk as Reassurance, Advocacy = Talk as Advocacy, BehInt = Behavioral Intentions

Table 3

Regression Coefficients for Attitude Accessibility and Behavioral Intentions

	Behavioral Intentions (Time 2)	
	Regression Coefficient	Standardized Regression Coefficient
Attitude Accessibility (Time 1)	.07	.10
Current Attitude (Time 1)	.16**	.14
Current Attitude (Time 2)	.62**	.53
Age	.00	.00
Emergency Preparedness	.01	.00
Natural Disasters	-.01	-.01
Evacuation	.03	.03
Attitude Accessibility (Time 2)	.07	.10
Constant	.37	
R^2	.48	
Adjusted R^2	.46	

Note. $^{**}p < .01$, $^{*}p < .05$, Emergency Preparedness = Occupation involves emergency preparedness, Natural Disasters = Number of natural disasters experienced in past five years, Evacuation = Number of evacuations experienced in past five years

Table 4

Regression Coefficients for Attitude Certainty and Behavioral Intentions

	Behavioral Intentions (Time 2)	
	Regression Coefficient	Standardized Regression Coefficient
Attitude Clarity (Time 1)	-.04	-.04
Attitude Correctness (Time 1)	.22**	.20
Current Attitude (Time 1)	.09	.08
Current Attitude (Time 2)	.42**	.36
Age	-.00	-.04
Emergency Preparedness	.08	.02
Natural Disasters	-.02	-.02
Evacuation	.03	.05
Attitude Clarity (Time 2)	-.00	-.01
Attitude Correctness (Time 2)	.22**	.31
Constant	-.19	
R^2	.58	
Adjusted R^2	.56	

Note. $^{**}p < .01$, $^{*}p < .05$, Emergency Preparedness = Occupation involves emergency preparedness, Natural Disasters = Number of natural disasters experienced in past five years, Evacuation = Number of evacuations experienced in past five years

Table 5

Regression Coefficients for Involvement and Behavioral Intentions

	Behavioral Intentions (Time 2)	
	Regression Coefficient	Standardized Regression Coefficient
Outcome (Time 1)	.08	.08
Value (Time 1)	-.04	-.05
Impression (Time 1)	-.02	-.03
Current Attitude (Time 1)	.15*	.13
Current Attitude (Time 2)	.56**	.47
Age	-.00	-.04
Emergency Preparedness	.01	.00
Natural Disasters	-.01	-.01
Evacuation	.04	.04
Outcome (Time 2)	.25**	.23
Value (Time 2)	.09*	.10
Impression (Time 2)	-.03	-.04
Constant	-.17	
R^2	.53	
Adjusted R^2	.51	

Note. $^{**}p < .01$, $^{*}p < .05$, Outcome = Outcome-relevant involvement, Value = Value-relevant involvement, Impression = Impression-relevant involvement, Emergency Preparedness = Occupation involves emergency preparedness, Natural Disasters = Number of natural disasters experienced in past five years, Evacuation = Number of evacuations experienced in past five years

Table 6

Regression Coefficients for Attitude Certainty and Talk as Reassurance

	Talk as Reassurance	
	Regression Coefficient	Standardized Regression Coefficient
Age	-.02	-.22
Emergency Preparedness	-.03	-.01
Natural Disasters	.12	.19
Evacuation	-.08	-.07
Attitude Clarity (Time 1)	-.06	-.06
Attitude Correctness (Time 1)	.47**	.42
Constant	3.73**	
R^2	.25	
Adjusted R^2	.19	

Note. $^{**}p < .01$, $^{*}p < .05$, Emergency Preparedness = Occupation involves emergency preparedness, Natural Disasters = Number of natural disasters experienced in past five years, Evacuation = number of evacuations experienced in past five years

Table 7

Regression Coefficients for Involvement and Talk as Reassurance

	Talk as Reassurance	
	Regression Coefficient	Standardized Regression Coefficient
Age	-.02*	-.25
Emergency Preparedness	-.35	-.12
Natural Disasters	.08	.12
Evacuation	-.11	-.10
Outcome (Time 1)	.36**	.34
Value (Time 1)	.26**	.33
Impression (Time 1)	-.05	-.07
Constant	3.31**	
R^2	.28	
Adjusted R^2	.22	

Note. ** $p < .01$, * $p < .05$, Outcome = Outcome-relevant involvement, Value = Value-relevant involvement, Impression = Impression-relevant involvement, Emergency Preparedness = Occupation involves emergency preparedness, Natural Disasters = Number of natural disasters experienced in past five years, Evacuation = Number of evacuations experienced in past five years

Table 8

Regression Coefficients for Attitude Certainty and Talk as Advocacy

	Talk as Advocacy	
	Regression Coefficient	Standardized Regression Coefficient
Age	-.00	-.04
Emergency Preparedness	.19	.07
Natural Disasters	.01	.01
Evacuation	.10	.09
Attitude Clarity (Time 1)	-.05	-.05
Attitude Correctness (Time 1)	.35*	.34
Constant	4.10**	
R^2	.11	
Adjusted R^2	.04	

Note. $^{**}p < .01$, $^{*}p < .05$, Emergency Preparedness = Occupation involves emergency preparedness, Natural Disasters = Number of natural disasters experienced in past five years, Evacuation = Number of evacuations experienced in past five years

Table 9

Regression Coefficients for Involvement and Talk as Advocacy

	Talk as Advocacy	
	Regression Coefficient	Standardized Regression Coefficient
Age	-.01	-.14
Emergency Preparedness	-.03	-.01
Natural Disasters	-.05	-.08
Evacuation	.05	.05
Outcome (Time 1)	.49**	.50
Value (Time 1)	.10	.13
Impression (Time 1)	-.03	-.05
Constant	3.24**	
R^2	.27	
Adjusted R^2	.21	

Note. ** $p < .01$, * $p < .05$, Outcome = Outcome-relevant involvement, Value = Value-relevant involvement, Impression = Impression-relevant involvement, Emergency Preparedness = Occupation involves emergency preparedness, Natural Disasters = Number of natural disasters experienced in past five years, Evacuation = Number of evacuations experienced in past five years

Table 10

Regression Coefficients for Discussion and Attitude Accessibility

	Attitude Accessibility (Time 2)	
	Regression Coefficient	Standardized Regression Coefficient
Age	-.01	-.06
Emergency Preparedness	-.49	-.14
Natural Disasters	-.05	-.06
Evacuation	-.05	-.04
Attitude Accessibility (Time 1)	.39**	.37
Talk as Reassurance	.49**	40
Talk as Advocacy	-.15	-.13
Frequency of Discussion	.17*	.20
Constant	1.63**	
R^2	.40	
Adjusted R^2	.34	

Note. ** $p < .01$, * $p < .05$, Emergency Preparedness = Occupation involves emergency preparedness, Natural Disasters = Number of natural disasters experienced in past five years. Evacuation = Number of evacuations experienced in past five years.

Table 11

Regression Coefficients for Discussion and Attitude Correctness

	Attitude Correctness	
	Regression Coefficient	Standardized Regression Coefficient
Age	.01	.15
Emergency Preparedness	-.02	-.01
Natural Disasters	.10*	.20
Evacuation	-.14	-.15
Attitude Correctness (Time 1)	.32**	.34
Talk as Reassurance	.15	.18
Talk as Advocacy	.24*	.26
Frequency of Discussion	-.09	-.15
Constant	1.51**	
R^2	.46	
Adjusted R^2	.41	

Note. ** $p < .01$, * $p < .05$, Emergency Preparedness = Occupation involves emergency preparedness, Natural Disasters = Number of natural disasters experienced in past five years, Evacuation = Number of evacuations experienced in past five years

Table 12

Regression Coefficients for Discussion and Outcome-Relevant Involvement

	Outcome-Relevant Involvement	
	Regression Coefficient	Standardized Regression Coefficient
Age	.01	.10
Emergency Preparedness	-.07	-.03
Natural Disasters	-.08	-.15
Evacuation	.07	08
Outcome (Time 1)	.36**	.43
Talk as Reassurance	.06	.08
Talk as Advocacy	.18*	.24
Frequency of Discussion	07	.12
Constant	1.95**	
R^2	.41	
Adjusted R^2	.35	

Note. $^{**}p < .01$, $^{*}p < .05$, Outcome = Outcome-relevant involvement, Emergency Preparedness = Occupation involves emergency preparedness, Natural Disasters = Number of natural disasters experienced in past five years, Evacuation = Number of evacuations experienced in past five years

Table 13

Regression Coefficients for Discussion and Value-Relevant Involvement

	Value-Relevant Involvement	
	Regression Coefficient	Standardized Regression Coefficient
Age	-.01	-.08
Emergency Preparedness	.05	.01
Natural Disasters	.08	.11
Evacuation	-.08	-.07
Value (Time 1)	.29**	.32
Talk as Reassurance	.32*	.28
Talk as Advocacy	.19	.16
Frequency of Discussion	-.01	-.01
Constant	1.25**	
R^2	.39	
Adjusted R2	.33	

Note. $^{**}p < .01$, $^{*}p < .05$, Value = Value-relevant involvement, Emergency Preparedness = Occupation involves emergency preparedness, Natural Disasters = Number of natural disasters experienced in past five years, Evacuation = Number of evacuations experienced in past five years

APPENDIX B

Phase One and Phase Two Surveys

Phase One Survey

Thank you for agreeing to participate in this survey about emergency preparedness. You will be asked to answer a few questions and then you will view a sample flier. You will be contacted again in two weeks to answer a series of follow-up questions.

First, you will need to create a unique identifier. In the space below please enter the first two letters of your mother's maiden name, the first three letters of your birth month, and the last 2 digits of your birth year. For example, if your mother's maiden name is Green, and you were born in March 1989, you would enter grmar89.

_____

Current Attitude (Burgoon, Cohen, Miller, & Montgomery, 1978).

What is your current opinion about following recommended evacuation procedures (1 = unfavorable attitude, 7 = favorable attitude)?

Following recommended evacuation procedures is:

Foolish/Wise (Removed)
Bad/ Good (Retained)
Unfavorable/ Favorable (Retained)
Wrong/Right (Retained)
Negative/Positive (Retained)

Attitude Accessibility (Krosnick, Boninger, Chaung, Berent, Carnot, 1993)

Compared to other issues, how often do you think about following recommended evacuation procedures (1 = not very often, 7 = not very often)?

Not very often/Very often (Retained)

Compared to other issues, how often do you discuss the issue of following recommended evacuation procedures with friends, family members, or others (1 = not very often, 7 = not very often)?

Not very often/Very often (Retained)

Involvement (Boninger, Krosnick, Berent, 1995)

Please rank the following statements on a scale of one to seven (1 = strongly disagree, 7 = strongly agree)

Outcome-relevant involvement

Whether or not I follow recommended evacuation procedures has little impact on my life. (Removed)
Following recommended evacuation procedures directly affects me. (Retained)
It is easy for me to think of ways following recommended evacuation procedures would affect my life. (Retained)
Following recommended evacuation procedures affects my ability to live the way I want to. (Removed)

Value-relevant involvement

My values determine my opinion about following recommended evacuation procedures. (Retained)
My opinion about following recommended evacuation procedures is based on my values. (Retained)
My opinion about following recommended evacuation procedures reflects who I am. (Removed)
Following recommended evacuation procedures has an impact on my values. (Removed)

Impression-relevant involvement

Following recommended evacuation procedures has little effect on what others think of me. (Removed)
The opinion that others have about me is affected when I talk about following recommended evacuation procedures. (Retained)
People may judge me based on my opinion about following recommended evacuation procedures. (Retained)
Following recommended evacuation procedures is important to people close to me. (Removed)

Behavioral Intentions

During the next major hurricane, please indicate how likely you are to (1 = very unlikely, 7 = very likely):

Follow recommended evacuation procedures. (Retained)

Participants will be exposed the message (if applicable)

Threat Induction Check (Pfau et al., 2010)

After viewing the flier, I believe that coming into contact with someone who will try to convince me to not follow recommended evacuation procedures is:

Susceptibility (1 = low, 7 = high)

Impossible/Possible (Retained)
Doubtful/Certain (Retained)
Improbable/Probable (Retained)
Unlikley/Likely (Retained)

Severity (1 = low, 7 = High)

Unintimidating/Intimidating (Removed)
Risky/ Not Risky (Removed)
Nonthreatening/Threatening (Retained)
Very Uncertain/Very Certain (Removed)
Not harmful/ Harmful (Removed)
Safe/Dangerous (Retained)
Not Worrisome/Worrisome (Retained)
Not Scary/Scary (Retained)
Not Severe/Severe (Removed)
Reassuring/Alarming (Removed)
Not Serious/Serious (Removed)
Not Upsetting/Upsetting (Removed)

Refutation Preemption Induction Check (created for this study)

The flier I just looked at had an argument about why I should not follow recommended evacuation procedures. True/False (Retained)

The flier I just looked at provided reasons about why I should not follow recommended evacuation procedures. True/False (Retained)

Attitude Certainty (Petrocelli, Tormala, & Rucker, 2007)

Attitude Clarity (1 = Very Unclear, 7 = Very Clear)

How certain are you that the attitude you expressed earlier in this survey about following recommended evacuation procedures is really the attitude you have? (Retained)

Very Uncertain/Very Certain

How certain are you that the attitude you have about following recommended evacuation procedures reflects your real feelings? (Retained)

Very Uncertain/ Very Certain

How clear in your mind is your attitude about following recommended evacuation procedures? (Removed)

Very Unclear/Very Clear

Attitude Correctness (1 = Very Uncertain, 7 = Very Certain)
How certain are you that your attitude about following recommended evacuation procedures is the correct attitude to have? (Retained)

Very Uncertain/Very Certain

To what extent do you think other people should have the same attitude as you about following recommended evacuation procedures? (Retained)

Very Unimportant/Very Important

How certain are you that of all of the possible attitudes you could have about following recommended evacuation procedures, your attitude is the right way to think and feel about the issue? (Removed)

Very Uncertain/Very Certain

Demographic Information

What is your sex?
- Male
- Female

What is your race/ethnicity?
- Caucasian
- African American
- Hispanic/Latino
- Asian/Pacific Islander
- Multiracial
- Other (Please list)_____

What is your age? ____

What is your marital status?
- Married
- Single
- Widowed
- Divorced/Separated

What is your occupation?
- Administrative
- Administrative Assistant
- Education
- Human and Social Services
- Government/Political
- Manufacturing
- Medical
- Military/Protective Services
- Retired
- Sales/Retail
- Stay at home provider
- Student
- Technology/Engineering
- Trade Worker
- Other (please describe)_____

Does your occupation involve emergency preparedness?
- Yes
- No

What is your level of education?

- Some high school
- High school
- Some college
- Technical school
- College degree
- Masters degree
- Doctorate

What is your average yearly income?

- Under $30,000
- $30,000-$59,999
- $60,000-$99,999
- $100,000-149,999
- $150,000-$199,999
- $200,000-$249,999
- $250,000 or more

How many children do you have who are 18 years old or younger? ____

How many children do you have over the age of 18? ____

Are you the caregiver of a child (18 years or younger) who primarily lives your home? Yes/No

Are you the caregiver of a disabled individual who primarily lives in your home? Yes/No

Are you the caregiver of an elderly individual who primarily lives in your home? Yes/No

What county do you live in? _____

Do you rent or own a home?

- Not Applicable
- Rent
- Own

How many natural disasters have you experienced in your lifetime? ____

How many natural disasters have you experienced in the last five years? _____

How many times have you had to engage in an emergency evacuation in the last five years?_____

How many times have you had to engage in an emergency evacuation in your lifetime?_____

What level of property damage have you or your family experienced due to a natural disaster?

Not Applicable
No property damage
Minor property damage
Moderate property damage
Major property damage

What level of personal injury have you or your family experienced due to a natural disaster?

Not Applicable
No injury
Minor injury
Moderate injury
Major injury

Phase 2 Survey

Thank you for agreeing to participate in this survey. You will be asked a few questions about your opinions and behaviors regarding following recommended evacuation procedures.

First, you will need to create a unique identifier. In the space below please enter the first two letters of your mother's maiden name, the first three letters of your birth month, and the last 2 digits of your birth year. For example, if your mother's maiden name is Green, and you were born in March 1989, you would enter grmar89.

_____

Interpersonal Discussion (created for this study)

In the past two week how many times did you talk to someone about following recommended evacuation procedures?

____times (Retained)

Talk as Reassurance (created for this study)

Please rank the following statements on a scale of one to seven (1 = strongly disagree, 7 = strongly agree)

I talked to others about following recommended evacuation procedures to learn their opinion. (Retained)
I talked to others about following recommended evacuation procedures to reduce my uncertainty. (Removed)
I talked to others about following recommended evacuation procedures to see what they think. (Retained)
I talked to others about following recommended evacuation procedures to reassure myself that my attitude was acceptable. (Retained)
I talked to others about following recommended evacuation procedures to feel more confident about my beliefs. (Removed)

Talk as Advocacy (created for this study)
Please rank the following statements on a scale of one to seven (1 = strongly disagree, 7 = strongly agree)

I talked to others about following recommended evacuation procedures to tell them how important it is. (Retained)
I talked to others about following recommended evacuation procedures to convince them to believe what I do. (Removed)
I talked to others about following recommended evacuation procedures to persuade them to follow evacuation procedures. (Removed)
I talked to others about following recommended evacuation procedures to get them to think about planning for an evacuation. (Retained)
I talked to others about following recommended evacuation procedures to protect them from harm in the future. (Retained)

Current Attitude (Burgoon, Cohen, Miller, & Montgomery, 1978).

What is your current opinion about following recommended evacuation procedures (1 = unfavorable attitude, 7 = favorable attitude)?

Following recommended evacuation procedures is:

Foolish/Wise (Removed)
Bad/ Good (Retained)
Unfavorable/ Favorable (Retained)
Wrong/Right (Retained)
Negative/Positive (Retained)

Attitude Accessibility (Krosnick, Boninger, Chaung, Berent, Carnot, 1993)

Compared to other issues, how often do you think about following recommended evacuation procedures (1 = not very often, 7 = not very often)?

Not very often/Very often (Retained)

Compared to other issues, how often do you discuss the issue of following recommended evacuation procedures with friends, family members, or others (1 = not very often, 7 = not very often)?

Not very often/Very often (Retained)

Attitude Certainty (Petrocelli, Tormala, & Rucker, 2007)

Attitude Clarity (1 = Very Unclear, 7 = Very Clear)

How certain are you that the attitude you expressed earlier in this survey about following recommended evacuation procedures is really the attitude you have? (Retained)

Very Uncertain/Very Certain

How certain are you that the attitude you have about following recommended evacuation procedures reflects your real feelings? (Retained)

Very Uncertain/ Very Certain

How clear in your mind is your attitude about following recommended evacuation procedures? (Removed)

Very Unclear/Very Clear

Attitude Correctness (1 = Very Uncertain, 7 = Very Certain)
How certain are you that your attitude about following recommended evacuation procedures is the correct attitude to have? (Retained)

Very Uncertain/Very Certain

To what extent do you think other people should have the same attitude as you about following recommended evacuation procedures? (Retained)

Very Unimportant/Very Important

How certain are you that of all of the possible attitudes you could have about following recommended evacuation procedures, your attitude is the right way to think and feel about the issue? (Removed)

Very Uncertain/Very Certain

Involvement (Boninger, Krosnick, Berent, 1995)

Please rank the following statements on a scale of one to seven (1 = strongly disagree, 7 = strongly agree)

Outcome-relevant involvement

Whether or not I follow recommended evacuation procedures has little impact on my life. (Removed)
Following recommended evacuation procedures directly affects me. (Retained)
It is easy for me to think of ways following recommended evacuation procedures would affect my life. (Retained)
Following recommended evacuation procedures affects my ability to live the way I want to. (Removed)

Value-relevant involvement

My values determine my opinion about following recommended evacuation procedures. (Retained)
My opinion about following recommended evacuation procedures is based on my values. (Retained)
My opinion about following recommended evacuation procedures reflects who I am. (Removed)
Following recommended evacuation procedures has an impact on my values. (Removed)

Impression-relevant involvement

Following recommended evacuation procedures has little effect on what others think of me. (Removed)
The opinion that others have about me is affected when I talk about following recommended evacuation procedures. (Retained)
People may judge me based on my opinion about following recommended evacuation procedures. (Retained)
Following recommended evacuation procedures is important to people close to me. (Removed)

Behavioral Intentions

During the next major hurricane, please indicate how likely you are to (1 = very unlikely, 7 = very likely):

Follow recommended evacuation procedures. (Retained)

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