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MEANING, RESILIENCE, AND TRAUMATIC STRESS FOLLOWING THE GULF OIL  
SPILL: A STUDY OF MISSISSIPPI COASTAL RESIDENTS SEEKING MENTAL HEALTH  
SERVICES

A Thesis  
presented in partial fulfillment of requirements  
for the degree of Master of Arts  
in the Department of Psychology  
The University of Mississippi

by

BETHANY J. AIENA

July 2014

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## **ABSTRACT**

In April of 2010, the Deepwater Horizon Oil Platform exploded, resulting in the release of millions of gallons of oil into the Gulf of Mexico over a period of three months. In addition to the ecological and economic impact of the disaster, the spill also had a significant impact on the psychological well-being of coastal residents. Following a disaster, not all affected people experience the same level of distress or long-term, negative psychological effects. Coping mechanisms such as resilience and perceived meaning in life are essential variables in understanding how people respond to a wide range of disasters. The present study examines the relationship between resilience, perceived meaning in life, and traumatic stress symptoms among coastal residents of Mississippi directly affected by the Gulf Oil Spill. The study was conducted as part of a larger project that assessed the impact of the Gulf Oil Spill on the mental health of individuals seeking therapeutic services ( $N = 1119$ ). It was predicted that meaning and resilience would be related to each other significantly and positively and that individuals with higher levels of resilience and/or perceived meaning in life would report significantly fewer symptoms of posttraumatic stress. After controlling for the impact of the spill, it was also predicted that both resilience and meaning would be significant predictors of posttraumatic stress symptoms and that adding meaning to the resilience model would make for a stronger model overall. Multiple hierarchical regression analysis was conducted to determine if resilience and perceived meaning are significant predictors of scores from a measure of posttraumatic stress. Meaning and resilience were found to be significantly and positive correlated. Higher levels of resilience and

meaning separately were both predictive of lower levels of posttraumatic stress scores, and resilience and meaning together were predictive of posttraumatic stress after controlling for the impact of the spill. Based on the analyses, it is apparent that resilience and perceived meaning in life are similarly strong, significant predictors of fewer posttraumatic stress symptoms and these two constructs are highly correlated. Implications for these data are discussed.

## LIST OF ABBREVIATIONS AND SYMBOLS

BP	British Petroleum
BRS	Brief Resilience Scale
CD-RISC	Connor-Davidson Resilience Scale
CES-D	Center for Epidemiologic Studies-Depression Scale
DASS-21	Depression, Anxiety and Stress Scales-21
MS DMH	Mississippi Department of Mental Health
MS-C	Mississippi Scale for PTSD, Civilian Version
PCL	PTSD Checklist
PCL-C	PTSD Checklist – Civilian Version
PCL-M	PTSD Checklist – Military Version
PCL-S	PTSD Checklist – Stressor Specific Version
PTSD	Post-Traumatic Stress Disorder
PIL	Purpose in Life Test
PIL-SF	Purpose in Life Test – Short Form
RS	Resilience Scale
RS-14	14-Item Resilience Scale
VIF	Variance Inflation Factor

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## I. INTRODUCTION

In April of 2010, the Deepwater Horizon Oil Platform exploded, killing 11 rig workers and eventually releasing nearly five million barrels of oil into the Gulf of Mexico over the course of three months (Robertson & Krauss, 2010). Since the spill, the negative ecological impacts have been demonstrated through an increase in the deaths of land and marine wildlife, with large peaks seen in adult and infant/fetal dolphins washing up on the shores of Mississippi and Alabama, coupled with a decrease in indigenous plant-life in coastal marshlands (Boxall, 2011). Biologists studying the coast predict that the full impact of the spill will not be known for years (Boxall). Many industries along the coast also experienced negative effects of the spill such as decreases in commercial and recreational fishing and tourism (Gill, Picou, & Ritchie, 2012). Consequently, many people in these industries lost their jobs. Both technological and natural disasters can have long-term, negative psychological impacts on those that are affected, and the broad impact of disasters leave whole communities struggling to return to normalcy.

The Gulf Oil Spill, according to Howard Osofsky, is distinct from other disasters because of its retraumatization of people living on the Gulf Coast, its population diversity of the affected area, and the history of the affected area (IOM, 2010). According to Osofsky, when the Gulf Oil Spill occurred, people on the coast were still in the process of recovering from Hurricanes Katrina, Rita, and Gustav; therefore, individuals that experienced trauma from the hurricanes were at an increased risk of psychological distress due to the cumulative effects of multiple traumas (i.e., retraumatization). Secondly, the Gulf Coast's diverse population is another unique

aspect of this disaster. People living along the coast affected by the spill may also be hesitant to participate in mental health treatment due to stigma (i.e., mental illness stigma is more prevalent in some populations in comparison to others, and is associated with decreased service-seeking behaviors). Thirdly, the unique history of the Gulf Coast (e.g., multiple generations losing their jobs as fishermen due to the spill) makes this disaster distinct from other disasters. A Gallup Poll conducted with residents of the Gulf Coast after the spill revealed an overall decline in emotional health, with increased sadness, depression, stress, and worry being particularly common (Witters, 2010). Yun, Lurie, and Hyde (2010) reported that following the spill, calls to mental health assistance hotlines increased significantly as many Gulf Coast residents experienced increased worries about their families' financial future.

### **The Impact of Disasters**

The most common psychological sequelae associated with disasters are generally anxiety, depression, and posttraumatic stress disorder (PTSD), along with increases in people seeking mental health services, the reporting of somatic complaints, and the experiencing of relationship problems (for reviews, see Fothergill, Maestas, & Darlington, 1999; Green & Lindy, 1994; and Norris et al., 2002). For instance, Weems and colleagues (2007) surveyed people living in regions affected by Hurricane Katrina in the months immediately following the storm and found that over half of the respondents reported at least one symptom of PTSD measured via an adapted version of the PTSD Checklist (Amaya-Jackson, McCarthy, Newman, & Cherney, 1995). While Green and Lindy (1994) reported that negative mental health effects usually last around two years after a disaster occurs, some research suggests that the mental health effects of a technological disaster can last much longer than a natural disaster (Baum & Fleming, 1993). For example, Palinkas, Petterson, Russell, and Downs (1993) saw an increase in PTSD,

generalized anxiety, and depression following the *Exxon Valdez* oil spill in 13 affected Alaskan communities. Additionally, Palinkas and colleagues found that the prevalence of PTSD one year after the spill was 9.4%, which is higher than the lifetime prevalence of PTSD reported in the National Comorbidity Survey (7.8%; Kessler et al., 1995). In addition to the ecological and economic impact of the Gulf Oil Spill, physical and psychological impacts were experienced by many as a result of the disaster (McCauley, 2010).

While disasters generally have a negative impact on those affected, research has shown that the more severely a person is affected, the more likely they are to experience posttraumatic stress. For instance, Brewin, Andrews, and Valentine (2000) found via a meta-analytic study an average weighted effect size of  $r = 0.23$  for the association between the severity of the trauma and the subsequent severity of PTSD response. Norris and colleagues (2002) reported that this relationship can be observed across cultures. Further, following the September 11<sup>th</sup> terrorist attacks, researchers found that proximity to the traumatic event generally predicted the prevalence rates of PTSD, with those closer to the location having higher prevalence rates (Galea et al., 2007; Schlenger et al., 2002). Another way of measuring degree of impact is by examining the actual physical impact that the event had on the individual. For example, survivors of the Oklahoma City bombing who received physical injuries had a higher risk of developing PTSD symptoms (Tucker, Pfefferbaum, Nixon, & Dickson, 2000).

Although a disaster affects large numbers of individuals, not all people affected experience the same level of distress or long-term, negative psychological effects. Effects can range from the long-term to the short-term, and involve a range of reactions, from clinical syndromes such as PTSD to short-term problems in daily functioning followed by a return to pre-disaster levels of functioning (Copeland, Keeler, Angold, & Costello, 2007; Williams,

McDevitt-Murphy, Fields, Weathers, & Flood, 2011). Numerous epidemiological studies have found that the majority of people (reportedly 60-80%) will experience at least one major traumatic event in their lifetime, and yet the lifetime prevalence of PTSD remains relatively low (approximately 8%) in comparison (Breslau, 2009; Halpern & Tramontin, 2007; Kessler et al., 1995; Norris, 1992; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993).

A number of explanations have been offered to explain such findings, such as the benefits of social support (Brewin, et al., 2000; Ozer, Best, Lipsey, & Weiss, 2003), self-efficacy (Hirschel & Schulenberg, 2009), optimism (Rauch, Defever, Oetting, Graham-Bermann, & Seng, 2013), resilience (Arnetz, Rofa, Arnetz, Ventimiglia, & Jamil, 2013), and perceived meaning (Owens, Steger, Whitesell, & Herrera, 2009). While some of these protective factors come from external sources such as social support, others come from within the individual. Such internal coping strategies are of interest to researchers as they may help assuage the effects of disasters like the Gulf Oil Spill. By way of a recent example, Doherty and Clayton (2011) proposed a model that states that coping mechanisms such as resilience and perceived meaning in life may serve to moderate the relationship between environmental changes, such as a disaster, and the subsequent psychological response. Along these lines, a number of theoretical and empirical advances have been increasingly evident in recent years, specifically focusing on concepts such as resilience and perceived meaning in life. Prior to discussing perceived meaning in life, a review is offered focusing on the importance of resilience.

## **Resilience**

Resilience is the ability to adapt to or withstand stressors and restore equilibrium to one's life after being confronted with a stressor (Bonanno, 2004; Wagnild & Young, 1993). Wong and Wong (2012) define it further as using available internal and environmental resources when

confronted with negative or adverse events. Resilient individuals may experience intrusive thoughts or memories about a traumatic event, but still continue to function at “normal” or routine levels (Bonanno & Mancini, 2012). Some researchers regard resilience as composed of multiple protective factors that work together (Herbert, Manjula, & Philip, 2013; Lyons, 1991; Rutter, 1985; Wagnild & Young, 1990). For example, Wagnild (2009b) described five characteristics that comprise the “Resilience Core”: perseverance, equanimity, meaningfulness, self-reliance, and existential aloneness. Perseverance is defined as the ability to continue on even in the face of setbacks. People who possess equanimity are characterized as having a stable view of life and their experiences and often have a sense of humor. Meaningfulness is when a person recognizes that their life has purpose and meaning. People who are self-reliant recognize their own personal strengths and can rely on those strengths to guide their actions. Finally, existential aloneness is the recognition that while some experiences can be shared with other people, one must be able to face and manage other experiences alone.

It has long been acknowledged that stressful, potentially traumatic life events can make a person more vulnerable to mental disorders (Garmezy & Rutter, 1985). For years, researchers have been interested in what makes people more resilient when faced with traumatic events, and therefore less likely to develop trauma-related mental disorders. While work in resilience is proliferating, and it is a concept that many researchers and practitioners consider to be essential to understanding trauma-related responses, it is still in the early stages as a science (Shahar, 2012). Research on this topic became prominent in the 1960s, gaining momentum in the late 80’s to early 90’s in studies of children (Garmezy, 1993; Rutter, 1987; Werner, 1984; Wong & Wong, 2012).

In 1964, Michael Rutter carried out epidemiological studies of educational, psychiatric, and physical disorders of children known as the Isle of Wight Studies (Rutter, 1976). He noticed that while stressors like parental marital conflict, parental mental illness, low socioeconomic status, parental delinquency, large family size/overcrowding, and placement into government care left children more vulnerable to mental illness, a significant number of these children were able to overcome these stressors and not experience long-term, negative mental health impacts (Rutter, 1979). Rutter also determined that the number of stressors had a significant impact on children's mental health, with more stressors being related to less likelihood of positive outcomes and children with one stressor being no more likely than the children with no stressors to develop a psychiatric disorder (Rutter, 1979). He concluded that there were certain protective factors that guard some children from succumbing to stressors, and that this was an area that needed to be investigated further (Rutter, 1979).

Garnezy, Masten, and Tellegen (1984) studied children from urban environments in the United States that had either experienced significant stressors (determined using the Life Events Questionnaire; Coddington, 1972), had early life stress due to life-threatening congenital heart defects, or were children with severe physical handicaps being transitioned into non-special education classrooms. Garnezy et al. used social competence as the measure of the child's outcome following the stress or negative experience, comprised of academic achievement, classroom behavioral competence, and interpersonal competence. Garnezy and colleagues described a three-model approach to stress resistance as the influence that one's own adversity and personal strengths/attributes have on one's level of adaptation, and it consisted of the compensatory, challenge, and protective factor models. The compensatory model was described as the interaction of stress and personal attributes being predictive of competence. If stress is

held constant, competence correlates positively with strength of adaptive attributes, and if attributes are held constant, competence would correlate negatively with stress level. In this model, it is a person's qualities of strength that offers protection from the impact of severe stress. In the challenge model, if the degree of stress is not extreme, it was thought that it could potentially boost or enhance competence. The relationship between stress and competence was described as curvilinear. In the protective factor model, the relationship between stress and personal attributes is described as conditional with respect to adaptation. Garmezy and colleagues argued that personal attributes modify the impact of stress by either inhibiting or amplifying it. In other words, when these protective factors are present, the level of stress has a lesser impact on the quality of a person's adaptation than when the protective factors are not present. This model is also known as the "immunity-versus-vulnerability" model. Those people with more protective factors (or better quality protective factors) are more immune to the effects of stress, whereas those with fewer protective factors (or lower quality protective factors) are more vulnerable to stress. Garmezy and colleagues used their work to demonstrate that more research is warranted with respect to understanding the relationships between protective factors, stress, and mental health.

The Kauai Longitudinal Study followed children from birth to 32 years of age and examined their vulnerability to negative developmental outcomes after being exposed to stressors early in life such as perinatal stress, poverty, parental mental illness, excessive conflict, and problems within the family (Werner, 1992). A major focus for Werner and colleagues was investigating the roots of resiliency in children that had successfully coped with these stressors and investigating the various protective factors that helped children to overcome adversity. Werner categorized a third of the children that had experienced multiple stressors as "high-risk"

and found that a third of the high-risk children went on to not only overcome the stressors, but were as or more successful than children in the low-risk group. Werner noted that certain protective factors seemed to predict successful adult adaptation in these high-risk children. These factors included the ability to easily elicit positive responses from caregivers due to temperament, the ability to efficiently capitalize on whatever skills and values they had, having parents with competent caregiving styles, and having supportive caregivers that fostered trust. This longitudinal study set the stage for many later intervention programs aimed at fostering resilience and promoting these protective factors in at-risk children, laying the foundation for the work that is being done on resilience today (Alvord & Grados, 2005; Zolkoski & Bullock, 2012).

In terms of more recent research, Christopher (2000) found that resilience was positively correlated with psychological well-being. In addition, research has found that resilience is positively correlated with optimism, self-esteem, gratitude, and positive affect and negatively correlated with posttraumatic stress, general psychological distress, and generalized anxiety (Arnetz et al., 2013; Baldwin, Jackson, Okoh, & Cannon, 2011; Fredrickson, Tugade, Waugh, & Larkin, 2003; Nishi, Uehara, Kondo, & Matsuoka, 2010; Scali et al., 2012; Tugade & Fredrickson, 2004).

Because research has demonstrated that resilience is a valuable construct that promotes psychological and physical well-being, it is becoming increasingly prevalent in the fields of both positive psychology and disaster psychology (e.g., Aiena, Baczwaski, Schulenberg, & Buchanan, 2013; Bonnano, 2004; Bonanno, Galea, Bucciarelli, & Vlahov, 2007; Doherty & Clayton, 2011; Herrman, 2012; Schulenberg, Drescher, & Baczwaski, 2014). Many researchers are aiming to find ways to foster and promote resilience to help individuals overcome significant stressors

(e.g., Consoli, Gonzales, & Lopez, 2012; Smith, Park, Ireland, Elwyn, & Thornberry, 2013; Stallard & Buck, 2013; Sun & Buys, 2012).

Today, interest in resilience continues to grow with both researchers and clinicians shifting their focus to what's right with an individual (as opposed to focusing exclusively on symptoms or diagnoses) and capitalizing on strengths to produce better long-term outcomes to stressors. For instance, with suicide rates in U.S. military reaching a record high in 2012 (Briggs, 2013), Youssef and colleagues (2013) found in a three-year, longitudinal study that higher levels of resilience at the initial point of assessment predicted lower levels of suicidality at follow-up. They proposed the need to increase resilience in current and future veterans as a means of promoting military members' psychological well-being. There is a clear need to study resilience, particularly with regard to clinical implications for prevention and therapeutic intervention efforts (Rutter, 2013).

While early resilience researchers primarily examined adjustment to chronic adversity in children, efforts have been expanded to better understand resilience as pertains to adjustment to more acute and broad traumatic events, such as natural or technological disasters, and examining the construct across the lifespan (Bonanno & Diminich, 2013). There is a need for resilience studies across a range of disasters, considering adults as well as children (Arnetz et al., 2013; Bonanno, 2004; Bonanno, Westphal, & Mancini, 2011; Bonanno & Diminich, 2013; Karlin, Marrow, Weil, Baum, & Spencer, 2012; Zakour, 2012).

In addition to resilience, researchers have shown a growing interest in perceived meaning in life, and how perceived meaning relates to resilience and disaster-related events. For example, when examining a proposed model of resilience, Smith, Epstein, Ortiz, Christopher, and Tooley (2013) found that a person's perceived purpose in life was a strong predictor of overall

resilience. In addition, Wagnild (2009b) theorized that life meaning (meaning in life or life purpose) is one of the most important characteristics of resilience because it provides a foundation for the other four resilience characteristics (i.e., perseverance, equanimity, self-reliance, and existential aloneness). According to Wong and Wong (2012), effective resilience-building efforts should be meaning-centered for two primary reasons, the first having to do with the multifaceted nature of the resilience construct, and the second having to do with the aims of a meaning-centered approach (e.g., development of character strengths, moral strength, compassion for others, and supportive social ecologies), which would lead to greater individual resilience. Undoubtedly, there is need to understand both resilience and perceived meaning in life individually, as well as how these concepts relate to one another. Understanding both concepts individually and collectively will enhance our understanding of the potential impact of disaster-related events. Prior to describing the purpose of the current study, the concept of perceived meaning in life is discussed in greater detail.

### **Perceived Meaning in Life**

Perceived meaning is defined as a person's belief that s/he is living her/his life in accordance with her/his own hierarchy of values (Frankl, 1959/2006; Schulenberg & Melton, 2010). Individuals with a high level of meaning have a sense of what is important in their lives. Perceived meaning in life (sometimes referred to as purpose in life or life purpose) rose to the forefront of psychology in the mid-20<sup>th</sup> century, with Viktor Frankl serving as a major leader in the field. Frankl developed the theory of logotherapy in the 1930's as a separation from then current, popular theories in psychology (Frankl, 1959/2006, 1986). Logotherapy focuses on the importance of meaning and purpose in life to the human condition (Schulenberg, Hutzell, Nassif, & Rogina, 2008). While Frankl's academic and clinical work with logotherapy was put on hold

in the 1940's due to the Holocaust, his experiences in the concentration camps allowed him to describe and validate first-hand how valuable a sense of meaning and purpose could be in traumatic situations (see Frankl, 1959/2006; Klingberg, 2001). For instance, Frankl was able to find the motivation and will to survive in several World War II concentration camps, over a period of years, because he had thoughts of one day being reunited with his wife.

Frankl developed logotherapy as a “will to meaning,” in contrast to Freud’s “will to pleasure” and Adler’s “will to power.” Frankl founded logotherapy on the belief that it is the search for one’s meaning in life that is the primary motivating force in humans (Frankl, 1959/2006). He emphasized that it was up to the individual to define and discover meaning in her or his life, devoting his work to describing principles that could guide individuals on the path to meaningful living (Wong, 2012). Three of the primary tenets of logotherapy include freedom of the will, will to meaning, and meaning in life (Frankl, 1959/2006; Melton & Schulenberg, 2008; Schulenberg et al., 2008). Freedom of the will refers to a person’s ability to choose how to respond to external circumstances, regardless of whether there is an apparent lack of freedom or how bleak these circumstances may be. Will to meaning refers to one’s drive to find meaning in life. This drive is a compelling force in a person’s existence. Meaning in life asserts that life has a purpose under all circumstances, even those that involve unavoidable suffering experiences. Such theoretical positions have clear implications for understanding the effects of a wide range of trauma-related events (Schulenberg, 2003; Schulenberg et al., 2008; Schulenberg et al., 2014). Today, the study of meaning has become an important aspect of both positive psychology and disaster mental health, and is most commonly referred to in the literature as meaning, perceived meaning, or meaning making (Halpern & Tramontin, 2007; Peterson, 2006; Peterson & Park, 2012; Schulenberg et al., 2008; Updegraff, Silver, & Holman, 2008).

In terms of coping with trauma, many theories have attempted to describe how people adapt to stressors, both emotionally and cognitively, and the toll that these stressors can have on people's views of themselves and the world around them (Janoff-Bulman, 1992; Neimeyer, 2001; Park, 2013; Silver & Updegraff, 2013; Steger & Park, 2012; Taylor, 1983; Thompson & Janigan, 1988). One way to conceptualize the adjustment of individuals during periods of trauma and stress is through meaning-making, which is defined as "the restoration of meaning in the context of highly stressful situations" (Park, 2010, p. 257). Meaning-making appears to play a central role with respect to disaster-related events, with different meaning-making theories tending to share four essential tenets (Silver & Updegraff, 2013). Specifically, (1) people have global belief systems that motivate and drive behavior and help them interpret ongoing experiences, (2) life experiences can challenge these belief systems, and people give meaning to these experiences, (3) people's distress is a function of how discrepant the meaning they give to a life experience is from their global belief systems, and (4) when distress occurs, people seek to reduce this discrepancy between their assessed meaning of the life experience and their belief system. By adjusting their global beliefs or assessed meaning of the experiences in order to reduce the discrepancy, distress should be lessened, with the person regaining a sense of order and coherence. Searching for meaning is not only a common response to trauma, but it can help one adjust to trauma in the long-term.

When confronted by disasters, people may lose their sense of security, becoming increasingly aware of life's fragility and their own vulnerability (Silver & Updegraff, 2013). For instance, in a study of individuals affected by a wildfire in California, Updegraff and colleagues (1996) found that those who had found meaning within two weeks after the fire reported significantly less distress over the following years. They also found that those who were able to

discover meaning in the disaster had a more rapid decrease in distress in the six months following the disaster than those who did not.

By way of another example, following the 9/11 terrorist attacks, Updegraff, Silver, and Holman (2008) longitudinally studied the effects that searching for meaning and finding meaning would have in a large, representative sample of Americans, both before and after the attacks. The authors determined that those who sought social support from others (e.g., by seeking advice) were more likely to find meaning in the terroristic attacks than those who either engaged in positive reframing (i.e., attempting to reconsider one's situation in a positive or optimistic way) or denial coping. The study demonstrated the importance of the social environment when searching for meaning (i.e., social support is essential to discovering meaning in such large-scale disasters). More importantly, the study provided some of the most important evidence that meaning-making in the context of the disaster is critically important in the long-term adjustment to a major disaster event. After controlling for pre-attack mental health, attack exposure, and early acute stress response, they found that meaning predicted posttraumatic stress symptoms. In other words, the more meaning people found in the months following the attack, the less posttraumatic stress symptoms they experienced over time. They explained that finding meaning led to adjustment by lessening fears about future terroristic attacks (Updegraff et al., 2008).

While perceived meaning helps people deal with symptoms of posttraumatic stress following a traumatic event, it has also been shown to be a significant factor in predicting strengths and positive psychological outcomes across a range of contexts and for a range of problems. Perceived meaning is related to positive psychological and physical health and a greater sense of well-being (Debats, Drost, & Hansen, 1995; Melton & Schulenberg, 2008; Steger, 2012; Zika & Chamberlain, 1992). Furthermore, a strong sense of meaning has been

shown to be positively related to life satisfaction, general self-efficacy, hope, and happiness (Bronk, Hill, Lapsley, Talib, & Finch, 2009; Byron & Miller-Perrin, 2009; Dogra, Basu, & Das, 2011; Drescher et al., 2012; Wnuk, Marcinkowski, & Fobair, 2012). Perceived meaning in life is also negatively correlated with alcohol use, depression, internalized stigma to one's own mental illness, general psychological distress, and suicidal ideation (Dogra et al.; Ehrlich-Ben Or et al., 2012; Schnetzer, Schulenberg, & Buchanan, 2013; Schulenberg, Schnetzer, & Buchanan, 2011). Additionally, perceived meaning has been shown to predict life satisfaction post-trauma in both adolescents and adults (Halama & Dedova, 2007; Triplett, Tedeschi, Cann, Calhoun, & Reeve, 2011). Following the Gulf Oil Spill, perceived meaning in life was a stronger predictor of life satisfaction than both self-efficacy and the perceived impact of the spill (Drescher et al., 2012).

As noted previously, some have asserted or described the importance of perceived meaning in relation to resilience (Park, 2013; Steger & Park, 2012; Wagnild, 2009b). However, there are few studies that actually examine the potential contributions that meaning may offer in relation to resilience, in a rigorous or systematic way, with many studies overlooking perceived meaning's influence completely (e.g., Lee, Sudom, & Zamorski, 2013). Research that has looked at both constructs appears to inadequately measure either construct by either using one question about meaning from a larger scale to account for one's perceived meaning in life or using a random battery of positive variable scales of the researcher's choosing (e.g., psychological well-being, social network, and positive affect) and labeling the amalgamated outcome as the indicator of resilience (Heisel & Flett, 2008; Pan, 2011). Consequently, resilience researchers may be overlooking a key aspect of what makes an individual resilient, thus not fully measuring respondents' current and actual level of resilience. Further, these researchers may possibly be missing a core area to be strengthened during resilience-building exercises. Research is needed to

clarify the nature of these constructs in relation to one another. Clarification needs to be made as to the distinctiveness or likeness of each construct in order to more clearly study these variables in the future. For instance, some researchers conceptualize the concepts as being separate but related, while others conceptualize meaning as part of a larger definition of resilience. Many studies have independently examined the effect that resilience and meaning have on traumatic stressors, but these concepts have yet to be examined in conjunction with one another.

### **Present Study**

The present study investigated the relationship between resilience, perceived meaning in life, and posttraumatic stress symptoms among Mississippi coastal residents directly affected by the Gulf Oil Spill. Previous studies have accessed this data set in order to examine different empirical questions. Specifically, studies have investigated the negative psychological impact of the spill (Drescher, Schulenberg, & Smith, 2014); the impact of the Gulf Oil Spill and Hurricane Katrina on environmental attitudes and action (Walters et al., 2013); the role that perceived meaning in life, self-efficacy, and perceived spill impact had on life satisfaction (Drescher et al., 2012); and the systematic study of the psychometric properties of the 14-item Resilience Scale (Aiena, Baczwaski, Schulenberg, & Buchanan, 2013). A major goal of the current study was to use these data to better understand not only the negative psychological effects that can be caused by a technological disaster such as the Gulf Oil Spill, but also the protective factors that help people recover from these types of wide-spread disasters. This study adds to the body of existing literature by concurrently examining resilience and perceived meaning in life in relation to symptoms of posttraumatic stress. The hypotheses examined were as follows:

1. Meaning and resilience will be related to one another significantly and positively.

2. Individuals with higher levels of resilience and/or perceived meaning in life will report significantly fewer symptoms of posttraumatic stress.
3. Both resilience and meaning will be significant predictors of posttraumatic stress symptoms when controlling for the impact of the Gulf Oil Spill.
4. After controlling for the impact of the Gulf Oil Spill, resilience will be a significant predictor of posttraumatic stress, with the incorporation of meaning to the equation making for a stronger model.

## II. METHODS

### Participants

Participants in the present study consisted of 1119 adults ( $M_{\text{age}} = 38.76$ ,  $SD_{\text{age}} = 12.77$ ) that were seeking mental health services at treatment facilities along the coast of Mississippi in the months following the Gulf Oil Spill. Because this study was part of a larger series of studies, participants completed a battery of questionnaires (procedures are described below). Over half the sample was female ( $n = 613$ , 54.8%). Males comprised 43.9% of the sample ( $n = 491$ ). The sample was predominantly White/non-Hispanic ( $n = 765$ , 68.4%). African Americans ( $n = 236$ ) comprised 21.1% of the sample, while the remainder of the sample was comprised of Hispanic/Latino ( $n = 19$ , 1.7%) individuals, Asian American individuals ( $n = 18$ , 1.6%), or individuals who identified as “multiracial” ( $n = 27$ , 2.4%).

The majority of the sample reported an annual income below \$19,999 ( $n = 833$ , 74.4%). The second largest group of participants reported an annual income in the \$20,000 to \$39,000 range ( $n = 163$ , 14.6%), followed by 39 (3.5%) individuals reporting an income of \$40,000 to \$59,000. The rest of the sample ( $n = 41$ , 3.6%) reported an annual income of \$60,000 or higher. With regard to education, 511 participants (45.7%) reported achieving some college credit or higher (including associate’s, bachelor’s, master’s, professional, and doctoral degrees). Three hundred and forty-three participants (30.7%) reported achieving a high school diploma or GED, 166 participants (14.8%) reported some high school, 79 participants (7.1%) reported achieving

between a kindergarten and high school education, and 6 participants (.5%) reported receiving no formal schooling.

## **Measures**

**Perceived impact of the Gulf Oil Spill.** Perceived impact of the spill was assessed through three questions that were developed specifically for this project. The questions measured how the Gulf Oil Spill had changed the participants' financial situation, social relationships, and physical health. The general format of the questions was "How has the Gulf Oil Spill affected your financial situation (or social relationships or physical health)?" The questions utilized a 7-point, Likert-type scale with anchors ranging from 1 (greatly worsened) to 7 (greatly improved). The 7-point scale was used for the regression analyses, and the three items were averaged to create a single impact score. For descriptive analyses, ratings were collapsed into three categories: worsening (scores of 3 or less), no change (score of 4), and improvement (scores of 5 or more).

**PTSD Checklist-Specific Version.** The PTSD Checklist (PCL; Appendix A) is a measure of symptoms of posttraumatic stress disorder. There are three different, interchangeable versions that can be used in military settings (PCL-M), civilian settings (PCL-C), and settings in which there is a specific, identifiable stressful experience (PCL-S; Weathers, Huska, & Keane, 1991; Weathers, Litz, Herman, Huska, & Keane, 1993; Weathers, Litz, Huska, & Keane, 1994). The PCL-S, which was the version used in this study, prompts individuals to respond to a specific stressful experience (e.g., an oil spill). For this reason, the PCL-S is a useful measure to administer when the intent is to collect information about a specific event.

The PCL-S is a 17-item self-report scale designed to measure PTSD diagnostic criteria B, C, and D as outlined in the *DSM-IV* and subsequently the *DSM-IV-TR* (American Psychiatric

Association, 1994, 2000). Criterion B refers to intrusive recollections, for instance, re-experiencing the traumatic event through recurrent thoughts, images, or dreams (APA, 2000). Criterion C refers to avoidance/numbing symptoms, as may be evident through a person's attempts to avoid places, people, and conversations associated with the traumatic event. Symptoms also refer to a numbing of general affect that was not present prior to the traumatic event (APA, 2000). Criterion D refers to symptoms of hyper-arousal, such as being easily startled, trouble sleeping, irritability, and anger. For symptoms to meet criteria for PTSD, they must persist for more than one month and cause functional impairment in important areas of life, such as one's occupation or one's social context (APA, 2000).

The PCL-S utilizes a 5-point Likert-type response format with options ranging from 1 (not at all) to 5 (extremely). Scores on the PCL range from 17 (no endorsed symptoms of posttraumatic stress) to 85 (endorsing all posttraumatic stress symptoms listed as extremely bothersome). While many cutoff scores have been suggested over the years, a cutoff of 44 was used as a measure of clinical significance in conjunction with Ruggiero, Del Ben, Scotti, and Rabalais' (2003) paper on the psychometric properties of the PCL, as well as Hirschel and Schulenberg's (2009) paper on PTSD and self-efficacy in Hurricane Katrina survivors. This cutoff score was also found to have the best diagnostic efficiency (.90; Blanchard, Jones-Alexander, Buckley, & Forneris, 1996).

Cronbach's alpha coefficients in studies using versions of the PCL often range from the mid .80s to the high .90s, suggesting good to excellent internal consistency reliability of scores (Adkins, Weathers, McDevitt-Murphy, & Daniels, 2008; Blanchard et al., 1996; Bollinger, Vuevas, Vielhauer, Morgan, & Keane, 2008; Hirschel & Schulenberg, 2009; Ruggiero et al., 2003; Weathers, Litz, Herman, Huska, & Keane, 1993). A new study, one that accesses the

present data, albeit to address different empirical questions, reported excellent reliability support, specifically, a Cronbach's  $\alpha$  coefficient of .97 (Drescher et al., 2014). Drescher and colleagues (2014) also reported a mean score of 40.90 ( $SD = 19.21$ ; specific version; see Table 1) and 437 participants (39.1% of the sample) met or surpassed the clinical cutoff of 44 suggested by Blanchard and colleagues (1996). Ruggiero and colleagues (2003) found a mean score of 29.4 ( $SD = 12.9$ ; civilian version) in a sample of college students, and Weathers and colleagues (1993) found a mean score of 63.6 ( $SD = 14.1$ ; military version) in a sample of Vietnam veterans who met diagnostic criteria for PTSD. In a sample of Hurricane Katrina survivors, the mean score was 33.85 ( $SD = 15.68$ ; Hirschel & Schulenberg).

Weathers and colleagues (1993) demonstrated the convergent validity of PCL scores by correlating them with other measures of PTSD such as the Mississippi Scale for Combat-Related PTSD ( $r = .93$ ; Keane, Caddell, & Taylor, 1988), the Impact of Event Scale ( $r = .90$ ; Horowitz, Wilner, & Alvarez, 1979), the PK scale of the MMPI-2 ( $r = .77$ ; Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989), and the Combat Exposure Scale ( $r = .46$ ; Keane, Fairbank, Caddell, Zimering, Taylor, & Mora, 1989). Ruggiero and colleagues reported that the PCL demonstrated good discriminant validity because it correlated more highly with the Mississippi Scale for PTSD, Civilian version (MS-C; Vreven, Gudanowski, King, & King, 1995), a scale also designed to measure posttraumatic stress disorder, than it did with the Center for Epidemiologic Studies-Depression scale (CES-D; Radloff, 1977, 2013), a measure designed to assess depression symptoms. In a study that used the same data to investigate different empirical questions (Drescher et al., 2014), the PCL-S correlated significantly and positively with depression ( $r = .47$ ), anxiety ( $r = .50$ ), and stress ( $r = .49$ ) scores as measured by the Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1995). The PCL-S was chosen for use

because it is brief and straightforward to administer. Moreover, the measure possesses ample psychometric support and affords the opportunity to inquire specifically about the effects of the Gulf Oil Spill.

**14-Item Resilience Scale.** The 14-item Resilience Scale (RS-14; Wagnild, 2009b) was developed as a short form of the original 25-item Resilience Scale (RS; Wagnild & Young, 1993). Wagnild and Young developed the RS as a direct measure of resilience and based the items on a qualitative study of older women who had effectively overcome a major, negative life event (Wagnild, 2009a). According to Wagnild, the RS-14 was created with the idea of reducing completion time and burden on the respondent. RS-14 items were chosen because they had the highest inter-item correlations with the original RS, and also to measure the five characteristics of resilience discussed above (i.e., perseverance, equanimity, meaningfulness, self-reliance, and existential aloneness; Wagnild, 2009b). The RS-14 utilizes a 7-point Likert-type response format, and item scores are summed to determine overall level of resilience. Scores range from 14 to 98, and higher scores are suggestive of greater perceived resilience. The following scoring guidelines are provided by Wagnild (2009b): Very Low (14-56), Low (57-64), On the Low End (65-73), Moderate (74-81), Moderately High (82-90), and High (91-98). Individuals with scores that fall in the Very Low range are characterized as feeling isolated or alone, lacking energy and motivation, and possibly having difficulty finding meaning (Wagnild, 2009b). Those in the Low range are characterized as possibly feeling anxious, depressed or dissatisfied about their lives, feeling pessimistic in general, and may be feeling the need to make some changes (Wagnild, 2009b). Those who score in the range that is characterized as On the Low End often report some anxiety and depression. In addition, they may be experiencing some problems in their lives that they are trying to resolve, and may have trouble letting things go that they have no control over.

Wagnild (2009b) characterizes those in the Moderate range as having neither high nor low resilience, but possessing many characteristics of resilience that can be built on and strengthened. Those in the Moderately High range are characterized as individuals who are doing well, possessing the characteristics of resilient individuals (with room to grow, however). These individuals are likely to perceive life as being meaningful, and have a balanced and realistic life perspective. Finally, those in the High range are characterized as doing very well resilience-wise. They are rarely depressed or anxious. They tend to be optimistic and are able to return to routine levels of functioning, regaining their equilibrium when faced with life's difficulties. With regard to scores that are typically seen in studies, the mean score in the standardization sample of community-dwelling adults was 76.16 ( $SD = 13.9$ ), which places these individuals overall in the Moderate range (Wagnild, 2009b). In a recent study of the psychometric properties of the RS-14, a study involving both clinical and college student samples, Aiena et al. (2013) reported that the mean score for the college student sample ( $N = 1765$ ) was 74.88 ( $SD = 17.05$ ), while the mean score of the clinical sample (the current study accesses these same data, see Table 1) was 63.11 ( $SD = 19.87$ ; Aiena et al., 2013). Overall, these data place the student sample in the Moderate range and the clinical sample in the Low range.

With regard to the reliability of RS-14 scores, Wagnild (2009b) reported that the measure yields coefficient alphas of .90 and higher. In Aiena et al.'s (2013) analysis of the RS-14's psychometric properties, coefficient alphas ranged from .93 (clinical sample, see Table 1) to .96 (college student sample). As for validity of RS-14 scores, Wagnild's research demonstrated that the RS-14 is highly correlated with the original RS ( $r = .97, p < .001$ ). RS-14 scores are significantly and negatively correlated with measures of depression, disability, anxiety, stress, and PTSD (Aiena, Baczwaski, Buchanan, & Schulenberg, 2012; Nishi et al., 2010).

Alternatively, RS-14 scores are significantly and positively correlated with measures of self-esteem, social support, perceived meaning in life, and self-reported good health (Aiena et al., 2012; Nishi et al., 2010; Wagnild, 2009b). Such studies are supportive of the measure's construct validity. With regard to the measure's factor structure, principal components analyses with direct oblimin rotation supported a single-factor solution, with item factor loadings greater than .40 (Wagnild, 2009b). Additionally, Aiena and colleagues (2013) employed exploratory and confirmatory factor-analytic procedures in both clinical and college student samples, documenting support for the one-factor model with all items loading cleanly (>.30) onto the single factor. The one-factor model explained 53.2% of the variance in the clinical sample and 67.6% of the variance in the college student sample.

**The Purpose in Life Test-Short Form.** The Purpose in Life Test – Short Form (PIL-SF; Schulenberg, Schnetzer, & Buchanan, 2011; Appendix B) is a four-item version of the original, 20-item Purpose in Life test (PIL; Crumbaugh & Maholick, 1964, 1969). Like the PIL, it is used to assess perceived meaning and purpose in life, but it requires less time and respondent effort. While the PIL (and subsequently the PIL-SF) was originally derived from Frankl's logotherapy paradigm, it has been shown to have increased utility in the measurement of general meaning across a range of studies, regardless of theoretical perspective (Crumbaugh & Maholick; Schulenberg & Melton, 2010; Schulenberg et al., 2011; Schnetzer, Schulenberg, & Buchanan, 2013). The PIL-SF was developed based on factor-analytic studies of the PIL that demonstrated the presence of two distinct factors, exciting life and purposeful life (Schulenberg & Melton, 2010; Schulenberg et al., 2011). The PIL-SF was derived on the basis of the purposeful life factor with the inclusion of an additional PIL item that inquired directly about the presence of perceived meaning and purpose in life. The PIL-SF was developed to be a parsimonious, "purer"

measure of meaning than the original PIL, which had received criticism in recent years questioning the dimensionality of the scale (Schulenberg et al., 2011). Each of the four items employs a 7-point Likert-type scale with different anchors for each item. An example of an item is: I have discovered... 1 (no mission or purpose in life) to 7 (clear-cut goals and a satisfying life purpose). Scores on the PIL-SF range from 4 to 28, and a higher score is indicative of greater perceived meaning and purpose in life. Studies using the PIL-SF in samples of college students found mean scores of 22.67 ( $SD = 2.64$ ; Schulenberg et al., 2011) and 22.66 ( $SD = 2.64$ ; Schnetzer et al., 2013). In a study investigating how perceived meaning in life, self-efficacy, and posttraumatic stress influence life satisfaction in individuals affected by the Gulf Oil Spill, the mean of the PIL-SF was 19.32 ( $SD = 5.47$ ) (Drescher et al., 2012). Drescher and colleagues (2012) determined that PIL-SF scores were a better predictor of life satisfaction than self-efficacy and perceived effects of the spill. Their study accessed a subset of the data used in the present study. The mean, standard deviation, and reliability coefficient for the entire sample of adults seeking mental health services following the Gulf Oil Spill is presented in Table 1.

The PIL-SF possesses encouraging psychometric support across a growing number of empirical studies, and is a promising alternative to the original form (Bronk, 2014). Cronbach's  $\alpha$  coefficients of PIL-SF scores typically range from .79 to .86 (Schnetzer et al., 2013; Schulenberg et al., 2011). Further, in the published study, the investigation involving a subset of the current data, it was found that PIL-SF scores were reliable with a Cronbach's  $\alpha$  of .86 (Drescher et al., 2012). In addition, PIL-SF scores demonstrate good convergent and discriminant validity, positively correlating with other measures of life satisfaction and perceived meaning and negatively correlating with measures of depression, anxiety, stress, alcohol use, and boredom

proneness (Baczowski et al., 2012; Schulenberg et al., 2011; Schulenberg, Baczowski, & Buchanan, 2013).

## **Procedures**

Data accessed for the current study were part of a larger project consisting of many different agencies and organizations (Drescher et al., 2012; Drescher et al., 2014). Following the Deepwater Horizon Oil Spill (or Gulf Oil Spill), British Petroleum (BP) issued funds to state departments of mental health for the Gulf Coast states directly affected by the spill. The funds were to be used to provide mental health services to affected residents. The Mississippi Department of Mental Health (MS DMH) used the funds received to create the BP Behavioral Health Grant program, providing funds to 19 mental health organizations along the coast. These organizations offered a range of services, such as therapeutic interventions, mental health training programs, and community outreach efforts. MS DMH subsequently established a contract with Dr. Stefan E. Schulenberg (of The University of Mississippi's Department of Psychology), with a primary goal being to evaluate the impact of the spill on the mental health of individuals receiving services from the agencies funded under the grant. Dr. Schulenberg formed a university-based team comprised of graduate students and faculty in order to carry out these efforts.

Of the 19 different mental health facilities that participated in this study, 10 provided direct therapeutic services (e.g., psychotherapy, medication management). The organizations consisted of four private counseling centers, two mental health centers, one women's shelter, one Vietnamese community organization, one school-based counseling service, and one in-patient mental health hospital. Participants came into the facilities seeking services, and staff determined if they were affected by the Gulf Oil Spill. Those affected were then asked to complete a battery

of several questionnaires that included the PCL-S, the RS-14, and the PIL-SF, among many other measures of psychological distress, as well as well-being. Informed consent was obtained, and individuals had the opportunity to decline at any point in the study, for any reason. Oversight was provided by both MS DMH and The University of Mississippi Institutional Review Boards.

With regard to survey administration, both paper-and-pencil and computerized surveys were available. Participants completed the paper batteries individually, and any participants expressing difficulty in understanding the battery were given the opportunity to have a facility staff member read the questionnaire to them. Once paper batteries were completed, mental health facility staff sealed the batteries and mailed them (informed consent sheets sent separately) to The University of Mississippi for data entry and analysis. Sites that had internet capabilities were given links to the computer-administered battery created through Qualtrics. Data entered through this link were automatically entered and sent to the data team at The University of Mississippi. If the site was able to employ both methods of administration, trained test administrators were instructed to let respondents choose which format they would prefer. On the basis of previously-conducted research with regard to equivalence across paper-and-pencil and computerized formats, statistically significant and clinically-meaningful differences between paper-and-pencil and computerized tests were not anticipated (Schulenberg & Yutrzenka, 1999, 2001).

### **Statistical Analyses**

Data were entered and checked by trained graduate research assistants. If any participant data for the scales examined were missing or incomplete, they were dropped from the analyses. Standardized scores and Mahalanobis distance were used to check for univariate and multivariate outliers, respectively. Three participants were found to be univariate outliers (i.e., more than three standard deviations away from the mean), but analysis of their scores revealed that their

responses were within the normal range of responses as dictated by each measure's published acceptable range of responses. In other words, while the responses of these individuals were extreme, they were not outside of the realm of possibility (e.g., scoring a 3 on the PIL-SF). Therefore, the participants were subsequently left in the analyses (Kline, 2010).

Correlational analysis was conducted to examine the relationship between posttraumatic stress symptoms, the impact of the spill, resilience, and perceived meaning. It was predicted that when examining the bivariate correlation, resilience and perceived meaning would be related to each other significantly and positively. It was also predicted that individuals with higher levels of resilience and/or perceived meaning would report significantly fewer symptoms of posttraumatic stress. Hierarchical multiple regression was used in multiple instances. In the first case, the procedure was used to determine if higher levels of resilience were predictive of lower levels of posttraumatic stress symptoms, controlling for the effects of the Gulf Oil Spill. In the second case, hierarchical multiple regression was used to determine if higher levels of perceived meaning were predictive of fewer posttraumatic stress symptoms, again controlling for the effects of the Gulf Oil Spill. In the third case, hierarchical multiple regression was used to evaluate the extent that meaning influenced the relationship between resilience and posttraumatic stress. The perceived effects of the Gulf Oil Spill were entered into the first step in all three cases to account for its effect on symptoms of posttraumatic stress. In the third case (resilience + meaning), the second step of the regression analysis included resilience (RS-14 scores) and the third step included perceived meaning in life (PIL-SF scores).<sup>1</sup>

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<sup>1</sup> To this point, resilience has had a much larger presence in the field of disaster mental health which is why it was entered first into the regression equation to better understand the statistical role meaning played in the prediction of posttraumatic stress symptoms above and beyond individual resilience.

### III. RESULTS

**Descriptive analyses.** Descriptive statistics for each measure, including minimum, maximum, mean, standard deviation, and coefficient alpha values are presented in Table 1. In terms of the Gulf Oil Spill's impact on finances, relationships, and physical health, 410 respondents (36.6%) reported a worsened financial situation, 264 (23.6%) reported worsened social relationships, and 272 (24.3%) reported worsened physical health. Overall, 534 individuals (47.8%) reported that the spill had caused at least one of the three areas to become worse, and 134 (12.0%) reported that the spill worsened each of these three life areas (Drescher et al., 2014).

While it is not advisable to make a diagnosis in the absence of a comprehensive assessment that includes a clinical interview, 39.1% of the sample met the suggested clinical cutoff of 44 (Drescher et al., 2014; Ruggiero et al., 2003) for PTSD, with a mean PCL-S score of 40.90 ( $SD = 19.21$ ) for the entire sample. The mean score for the RS-14 was 63.11 ( $SD = 19.87$ ), which falls in the Low range as outlined in the measure's manual (Wagnild, 2009b). The mean score for individuals on the PIL-SF was 18.83 ( $SD = 5.45$ ), which is lower than what has been reported in college students samples. Coefficient alphas for the PCL-S, RS-14, and PIL-SF ranged from respectable to very good by interpretive standards (see DeVellis, 2012). The Gulf Oil Spill impact questions also had respectable internal consistency reliability.

**Hypothesis Testing.** Correlational analyses were conducted to determine the relationship between Gulf Oil Spill impact, resilience, perceived meaning, and posttraumatic stress symptoms

(see Table 2). Meaning and resilience were significantly and positively correlated with one another, suggesting that they are related, albeit distinct concepts (consistent with Hypothesis 1). In addition, individuals with more self-described resilience reported significantly fewer symptoms of posttraumatic stress, and individuals with higher levels of perceived meaning in life reported significantly fewer symptoms of posttraumatic stress. Both findings are supportive of Hypothesis 2. As expected, those who reported being more negatively impacted by the spill had higher levels of posttraumatic stress and lower levels of resilience and perceived meaning.

The third hypothesis stated that both resilience and meaning would be statistically significant predictors of posttraumatic stress symptoms when controlling for the impact of the Gulf Oil Spill. Hierarchical multiple regression was used to examine the relationship between posttraumatic stress, and resilience and meaning, separately. In the first step of both models, Gulf Oil Spill impact (i.e., the average of the three oil spill impact questions pertaining to the areas of finances, social relationships, and physical health) was entered to control for its effects on respondents. The model was a significant predictor of posttraumatic stress symptoms ( $F_{1,889} = 153.88, p < .001$ ) and accounted for approximately 15% of the variance in posttraumatic stress symptoms ( $R^2 = .15$ ). In step two of the resilience model, the RS-14 was added and was a significant predictor ( $F_{change\ 1,851} = 54.75, p < .001$ ), accounting for approximately 20% of the variance in posttraumatic stress symptoms ( $R^2 = .20$ ), adding 5.1% of predictive capacity ( $R^2_{change} = .05$ ). In step two of the meaning model, PIL-SF scores were added, with meaning a significant predictor of posttraumatic stress symptoms ( $F_{change\ 1,832} = 58.67, p < .001$ ), similarly accounting for approximately 20% of the variance ( $R^2 = .20$ ), adding 5.6% of predictive capacity ( $R^2_{change} = .06$ ). The standardized beta coefficients for each model ( $\beta_{resilience} = -.23, \beta_{meaning} = -.24$ ) indicate that both resilience and meaning are similar, significant contributors to each

respective regression equation. See Tables 3 and 4 for beta weights for each model. The findings of these analyses are supportive of hypothesis three.

The fourth hypothesis indicated that after controlling for the impact of the Gulf Oil Spill, resilience would be a significant predictor of posttraumatic stress, and incorporating meaning into the equation would make for a stronger model overall. A hierarchical multiple regression was conducted. In step one of the model, Gulf Oil Spill impact was entered to control for its effects. The model was a significant predictor of posttraumatic stress symptoms ( $F_{1,802} = 140.75$ ,  $p < .001$ ), accounting for approximately 15% of the variance in posttraumatic stress symptoms ( $R^2 = .15$ ). In step two of the model, RS-14 scores were added. RS-14 scores were a statistically significant predictor ( $F_{change\ 1,801} = 53.70$ ,  $p < .001$ ), accounting for approximately 20% of the variance in posttraumatic stress symptoms ( $R^2 = .20$ ), adding 5.3% of predictive capacity ( $R^2_{change} = .05$ ). In step three of the model, PIL-SF scores were added. This model also significantly predicted posttraumatic stress symptoms ( $F_{change\ 1,800} = 11.22$ ,  $p < .01$ ), accounting for approximately 21% of the variance in posttraumatic stress symptoms ( $R^2 = .21$ ). Adding meaning to the model provided an additional 1.1% predictive capacity ( $R^2_{change} = .01$ ). These findings are supportive of hypothesis four.

Further relating to hypothesis four, when examining the variables at the individual predictor level, both RS-14 and PIL-SF scores were significant (see Table 5). The standardized beta coefficients for each model ( $\beta_{resilience} = -.141$ ,  $\beta_{meaning} = -.139$ ) indicate that both resilience and meaning are roughly comparable contributors to the regression equation. Further, the semipartial correlations of RS-14 and PIL-SF scores were examined along with PCL-S scores to determine the relative importance of each predictor. When comparing the semipartial correlation of the RS-14 scores to the PCL-S scores (-.106), and the PIL-SF scores to the PCL-S scores (-

.105), it appears that both measures are of relatively equal importance in terms of predicting posttraumatic stress symptoms.

#### IV. DISCUSSION

The purpose of this study was to examine the predictive power of meaning and resilience for posttraumatic stress symptoms in a clinical sample of 1119 adults receiving services from 10 mental health agencies along the Gulf Coast of Mississippi following the Gulf Oil Spill. Measures used to assess these constructs included the PCL-S, RS-14, and PIL-SF. Correlational analyses demonstrated that meaning and resilience were related to each other both significantly and positively (hypothesis 1). In addition, those in the sample with higher levels of resilience and/or perceived meaning in life reported significantly fewer symptoms of posttraumatic stress (hypothesis 2). Further, when examined independently, both resilience and meaning were significant predictors of posttraumatic stress after controlling for the impact of the Gulf Oil Spill (hypothesis 3). Finally, in a more elaborate model that included Gulf Oil Spill impact (step one), resilience (step two), and meaning (step three), it was apparent that incorporating meaning resulted in a stronger model overall (hypothesis 4). Based on the analyses, it is evident that resilience and perceived meaning in life are similarly strong, significant predictors of fewer posttraumatic stress symptoms. Additionally, resilience and perceived meaning together significantly predict fewer symptoms of posttraumatic stress. However, adding perceived meaning to the regression model resulted in a small, albeit statistically significant, contribution to the overall model. This finding is discussed in detail below.

One notable finding from this research was the magnitude of the correlation between RS-14 and PIL-SF scores, and their similar statistical contributions when predicting posttraumatic

stress symptoms. According to Tabachnick and Fidell (2012), independent variables correlated at .70 and above should not be used in multiple regression analyses as they are too collinear. Additionally, tolerance and the variance inflation factor (VIF) are used as indicators of multicollinearity, and all variables were found to be well below the recommended cutoff for usage in statistical analyses (Hair, Anderson, Tatham, & Black, 1995; Kennedy, 1992). Therefore, while these two scales are significantly related, they are distinct to the extent that both may be included in regression models (i.e., although 45% of the variance is shared, 55% of the variance is not). The analyses overall suggested that the two measures were nearly interchangeable in the regression model, thus both clearly are important when considering posttraumatic stress symptoms in this context. However, in our case while adding meaning to resilience resulted in statistically significant improvement in predicting fewer posttraumatic stress symptoms, the improvement may not be clinically meaningful. Moreover, in a follow-up analysis, whereby meaning was entered into the equation prior to resilience, the results were nearly identical. Similarly, while resilience added significantly to meaning in the prediction of fewer posttraumatic stress symptoms, the results may not be clinically meaningful.

To better understand the relationship between meaning and resilience, one can examine more deeply the potential reasons for such a significant relationship. One explanation is that meaning may be as important as resilience in terms of its ability to predict posttraumatic stress symptoms following a disaster. Another possible explanation involves the similarities in the way that some researchers conceptualize these concepts (and therefore these similarities filter into the measures designed to assess the concepts). Finally, having meaning could be an essential aspect of what makes a person resilient.

Firstly, the strong, significant correlation between resilience and meaning, coupled with the approximately equal contributions to the regression equation, may be due to meaning being a similarly important protective factor in relation to resilience. While these constructs are clearly closely associated and share some similarities, they are distinctly different in that they, by definition, have different functions. Resilience is often regarded as the experiencing of a positive outcome (e.g., recovery, posttraumatic growth) in a type of situation that may lead to negative outcomes (e.g., psychopathology) by effectively using available personal and ecological resources (Luthar, Cicchetti, & Becker, 2000; Ungar, Brown, Liebenberg, Cheung, & Levine, 2008; Wong & Wong, 2012). Meaning, alternatively, is a driving force. If a person is aware of her/his values, and are making decisions and living her/his life consistently with those values, then life is likely going to be perceived as meaningful. As a driving or motivational force, it is what compels us to make sense of our world and to imbue us with a sense of purpose. Simply, it is what helps us to get out of bed in the morning and live with a sense of appreciation and mindfulness. Comparatively speaking, resilience is a characteristic while meaning is a prime motivator. Both concepts have large, independent bodies of research dedicated to their understanding and utilization as protective factors. With respect to disaster mental health, historically resilience has received greater attention. In light of the present findings, meaning is an equally strong predictor that demands comparable consideration, particularly with regard to disaster mental health. Meaning is held in high regard in positive psychology, with extensive research support as a protective factor against a range of psychological concerns. Yet, meaning is not as widely researched as resilience in relation to disaster events. There is some recent evidence, however, that this trend may be changing, with researchers demonstrating the

importance of meaning in terms of recovery from disasters (Drescher et al., 2012; Steger & Park, 2012; Updegraff, Silver, & Holman, 2008).

An additional explanation as to the magnitude of the correlation between RS-14 scores and PIL-SF scores lies in the fact that the RS-14 was meaning-based in its conception (Wagnild, 2009b). Both measures draw heavily on the work of Viktor Frankl and the RS-14 itself specifically addresses meaningful living in one of its items (item 13 - “My life has meaning”) and addresses logotherapy-related principles in other items (goal completion, item 2 - “I feel proud that I have accomplished things in life” and exciting life, item 9 - “I keep interested in things”; Schulenberg & Melton, 2010). While the magnitude of the correlation is particularly strong between the two measures, tolerance levels and variance inflation factors were well-within acceptable levels, so effects of multicollinearity can be ruled out. Essentially, while the scales are highly correlated, they are not functioning as identical scales. However, because of the correlation between the two scales and similar theoretical backgrounds, it is likely that the RS-14 is assessing a concept similar to meaning as measured by the PIL-SF, which was specifically designed to parsimoniously assess meaning/purpose in life. This would explain meaning’s contributing such a small amount to the overall regression model (and its subsequent small effect size,  $f^2 = .01$ ; Cohen, 1988), their similar importance in predictive capacity, and the nearly identical regression equations when the variables were reversed. Further, while both resilience and meaning have been defined in the literature, they are often conceptualized in various ways. As a result of various conceptualizations, there are multiple measures available to assess each concept. In the present case, because the RS-14 specifically addresses meaning in several items (items 2, 9, and 13) and was meaning-based in its construction in that Wagnild based a large portion of the RS-14 core foundation on Frankl’s logotherapy, it is unclear whether this scale

measures resilience in a “pure” fashion (Frankl, 1959/2006; Wagnild, 2009). In other words, the RS-14 may represent a blending of the two concepts and would be more aptly defined as a scale that measures both meaning and resilience rather than merely resilience. Research comparing the RS-14 to other resilience scales such as the Brief Resilience Scale (BRS; Smith et al., 2008) or the Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003) would clarify this issue. More broadly, and as mentioned earlier, many researchers are using their own combinations of questions or measures to assess respondent level of resilience, but these inadequate measurement habits may be leading to inaccurate conclusions. Therefore, it is important to either determine which measure is the most precise measure of resilience (i.e., the gold standard), if one exists, or whether it is necessary to develop a new measure of resilience that is psychometrically superior to current, available measures.

A third explanation of the magnitude of association between resilience and meaning is the idea that meaning may be an essential facet of what makes a person resilient. As discussed earlier, the “Resilience Core” is comprised of many pillars, and the RS-14 was meaning-based in its conception. Wagnild (2009b) stated that having a purposeful life is “probably the most important characteristic of resilience” because one’s purpose is the foundation for the other four characteristics in the core (p. 15). Wagnild further described purpose as what drives people forward even in the face of adversity. Theoretically, and coupled with the data from the present study, meaning may serve as an essential building block of resilience. In the way that Wagnild defines resilience, it appears that resilience is the broader, umbrella-term that encompasses these five characteristics (i.e., life purpose, perseverance, equanimity, self-reliance, and existential aloneness), and by this definition, to measure resilience, one needs to assess whether the individual perceives meaning. For example, Damon (2008) demonstrated that a key component

of helping young people respond resiliently to adversity is when they develop a sense of purpose and meaning that helps them to transcend self-interest. In addition, Frankl and meaning researchers describe how living a life that has meaning gives people a reason to bounce back from setbacks and adversities (Frankl, 1959/2006; Wong, 2010). If this is the case, researchers studying resilience without taking meaning into account may be excluding a significant contributing factor of what makes a person resilient. Furthermore, researchers examining resilience-building programs could be neglecting an important factor that, when bolstered, helps participants to recover more quickly from disasters.

Given that there are multiple potential reasons for the magnitude of correlation between meaning and resilience, what may be concluded from the present findings? Through an analysis of the results of this study, as well as an examination of the available research, it is apparent that meaning and resilience are related, albeit distinct, significant protective factors against symptoms of posttraumatic stress following a technological disaster. Nonetheless, there is probable measurement overlap within the RS-14 in that it may be measuring a blend of resilience and meaning rather than “pure” resilience. For these reasons, future research should aim to clarify the definitions of these concepts as well as refining how they are measured. Subsequent studies of both resilience and meaning should be conducted using clearly defined, agreed upon definitions, as well as precise and pure measures.

### **Strengths, Limitations, and Research Directions**

The results of this investigation are useful in a number of ways. The study examines two constructs, one more established in the field of disaster mental health than the other, and demonstrated their importance as protective factors against symptoms of posttraumatic stress. This study and previous ones using the existing data set (e.g., Drescher et al., 2014) demonstrate

the strong, negative impact that events like the Gulf Oil Spill can have on those affected.

Therefore, future studies should examine which interventions are most effective, as well as under what circumstances. Researchers are encouraged to examine intervention techniques pre and post disaster. Moreover, the relationship between symptoms of posttraumatic stress, resilience, and meaning has yet to be examined in a single study, or in a sample of adults seeking mental health services following a disaster. Finally, this study illuminates potential measurement issues with the RS-14 and with the construct of resilience in general.

While there are a number of strengths to the study, there are also a number of limitations, including the homogeneity of the sample, the correlational nature of the study, and the study's use of self-report data. The sample was predominantly White. Other racial/ethnic groups were underrepresented, perhaps in part due to racial and ethnic minorities being less likely to seek mental health services (Alvidrez, 1999; Dinwiddie, Gaskin, Chan, Norrington, & McCleary, 2013; Padgett, Patrick, Burns, & Schlesinger, 1994). This issue is important because risk for development of posttraumatic stress disorder varies on the basis of race/ethnicity. For example, African Americans have the highest lifetime prevalence rate (8.7%), followed by White and Hispanic/Latino individuals (7.4% and 7.0%, respectively), with Asian Americans having the lowest lifetime prevalence (4.0%; Roberts, Gilman, Breslau, Breslau, & Koenen, 2011). Further, research has shown that lower SES can lead to more distress in the aftermath of a disaster (Norris et al., 2002). The majority of the present sample (66%) reported an income of \$14,999 and below which could mean that the sample is reporting higher distress levels than individuals with a higher SES. In fact, when splitting this sample in another study, Drescher and colleagues (2014) found that lower income individuals did report significantly higher levels of overall distress following the Gulf Oil Spill. Future studies should examine the relationship between resilience,

meaning, and symptoms of posttraumatic stress in a more diverse sample to see if findings vary on the basis of culture and socioeconomic status.

Another limitation to the current study relates to its correlational nature and posttest-only design, as well as the lack of baseline data for purposes of comparison. As the study is correlational, causal inferences may not be made. Relatedly, due to the data being collected after the disaster (as opposed to before and after the event), the lack of information regarding pre-Gulf Oil Spill treatment and diagnostic histories is another limitation of this study (Drescher et al., 2014). This, however, is a common design flaw in disaster research as it is hard to predict a disaster's occurrence (Drescher et al., 2014; Galea, Maxwell, & Norris, 2008). While causal inferences may not be drawn from the current findings, these data can be used for comparison purposes for future studies of a similar nature. Future researchers are encouraged to examine these constructs using a longitudinal design to better understand the relationship and relative importance of resilience and perceived meaning as protective factors against symptoms of posttraumatic stress. Examples of questions that could be studied include the following: Is it resilience that leads an individual to discover meaning or is it the discovery of meaning in a disaster-related context that leads an individual to be resilient? In what disaster-related contexts do resilience and meaning co-occur? Are there disaster-related contexts where meaning would be present without resilience, and vice versa? Do the same factors that lead to resilience in a disaster-related context also lead to meaning, and vice versa? Along these lines, factors such as social support, hardiness, spirituality, locus of control, and formation of identity as a survivor contribute to resilience (Agaibi & Wilson, 2005; Escolas, Pitts, Safer, & Bartone, 2013; Whealin, Stotzer, Nelson, Li, Liu-Tom, & Pietrzak, 2013; Wilson, 1995; Wilson & Raphael, 1993), but one would also expect these factors to lead to the perception of meaning as well.

Studying individuals affected by disasters longitudinally will better illuminate the progression of their distress and eventual recovery, uncovering areas that would be the best targets for interventions. Although disaster research usually involves a post-only design, Galea and colleagues (2008) reported that using designs such as matched control groups can aid in increasing inferential power. Such studies may be particularly informative for future research in this area. In addition to studying clinical samples, the relationship between resilience, meaning, and symptoms of posttraumatic stress should also be examined in non-disaster affected, community samples to assess whether similar relationships can be found.

Longitudinal designs would also help to inform our understanding of the cumulative effects of multiple disasters. Many individuals in the sample used for this study were likely still recovering from weather-related events such as Hurricane Katrina, and were thus at an increased risk of psychological distress due to the cumulative effects of experiencing multiple disasters (IOM, 2010; Picou & Hudson, 2010). The experience of previous disasters could have exacerbated a posttraumatic stress response to the Gulf Oil Spill. Without baseline data or information on the psychological state of these individuals prior to the spill, it is not possible to determine the exact nature of the cumulative effects that multiple disasters could have had on these individuals (as compared to people who were not affected by these events). Future studies examining these constructs in samples affected by different types of disasters, as well as considering multiple disasters over a period of time, would be useful additions to the empirical literature in this area.

Another limitation of this study is the use of self-report measures. Multiple methods of data collection can help increase reliability and help researchers to account for potential biases that may influence individuals' responses to self-report measures. Due to logistical and financial

constraints, self-report data was the only feasible option for the present study. For such reasons, future studies should consider multiple sources of data, including structured or semi-structured interviews, as well as data from other sources (e.g., government damage reports). Using a comprehensive, multi-modal approach will enhance the understanding of the extent that individuals were affected by a given disaster.

As for additional directions for research, the findings from the current study further support the examination of resilience and meaning in conjunction with one another. With resilience-based interventions becoming increasingly prevalent in the literature, the results of this study demonstrate the need to incorporate meaning into such intervention efforts. With the incorporation of meaning into resilience-based interventions, the systematic benefits of this combination can be better studied and understood. Research on resilience-building programs, such as the Penn Resiliency Program, have become increasingly widespread (Brunwasser, Gillham, & Kim, 2009). The Penn Resiliency Program is a 12 to 24 session group intervention that teaches cognitive-behavioral and social problem-solving skills. Researchers could readily include modules on meaning-making and purposeful living. It would be expected that meaning-based interventions would enhance resilience-based interventions, and would conceivably help program participants with cultivating and maintaining positive short- and long-term benefits. In support of this rationale, case studies concerning the use of logotherapy as an adjunctive treatment to increase resilience in veterans with chronic PTSD found that incorporating meaning allows important psychological issues to be addressed, issues that are often neglected with more traditional therapy techniques like Trauma-Focused Cognitive-Behavioral Therapy (Southwick, Gilmartin, McDonough, & Morrissey, 2006; Southwick & Charney, 2012). By helping these individuals find meaning in their experiences through social action, they were able to use what

they learned to help others grow from similar experiences by doing things like volunteering with other veterans and educating the public on these issues. Thus, there is merit in the integration of meaning and resilience-based interventions.

An additional area of empirical inquiry in disaster mental health relates to preparedness. Rather than just responding to a disaster after it happens, researchers are examining how to better prepare people before a disaster occurs. Disaster preparedness efforts often focus on concrete aspects of preparedness, such as having enough supplies or knowing where to go and who to turn to for instruction in the event of a disaster. Many researchers are beginning to examine how best to mentally prepare people for disaster situations as a means of helping them to recover more quickly after an event has occurred. Programs like Stress Inoculation Training and/or resilience training aim to assist individuals cope more effectively with stressful events, enhancing their recovery (Wolmer, Hamiel, & Laor, 2011). Meaning-centered approaches to building resilience aim to help individuals determine what is important in their lives so that they can identify realistic, concrete goals that are in line with their perceived purpose or direction in life (Wong & Wong, 2012). Future research should examine the effect that meaning-based interventions may have on disaster preparedness efforts. Individuals who are goal-oriented and aware of their values would be expected to demonstrate greater preparedness. Such studies are essential, as the practical applications have the potential to save lives.

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Table 1.

*Descriptive statistics for impact questions, PCL-S, RS-14, and PIL-SF (N = 1119).*

Measure	Minimum	Maximum	<i>M</i>	<i>SD</i>	<i>α</i>
Impact	1.67	7.00	4.58	.86	.73
PCL-S	17	85	40.90	19.21	.97
RS-14	14	98	63.11	19.87	.93
PIL-SF	4	28	18.83	5.45	.88

Note: PCL-S = PTSD Checklist – Stressor Specific version; RS-14 = 14-Item Resilience Scale; PIL-SF = Purpose in Life Test – Short Form.

Table 2.

*Correlation Matrix for Variables Included in Regression Model (N = 1119).*

	Impact	PCL-S	Resilience	Meaning
Impact	-	.38***	-.12***	-.07*
PCL-S		-	-.25***	-.24***
Resilience			-	.67***
Meaning				-

Note: For all tables \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; PCL-S = PTSD Checklist – Stressor Specific version; RS-14 = 14-Item Resilience Scale; PIL-SF=Purpose in Life Test – Short Form.

Table 3.

*Resilience as a Predictor of Posttraumatic Stress Symptoms After Controlling for the Impact of the Gulf Oil Spill (N = 1119).*

Resilience Model			
Variable	<i>B</i>	<i>SE</i> of <i>B</i>	$\beta$
Impact	8.10	.68	.37***
Resilience	-.22	.03	-.23***
<i>R</i> <sup>2</sup> / <i>R</i> <sup>2</sup> Change		.20/.05	

Note: For all tables \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; PCL-S = PTSD Checklist – Stressor Specific version; RS-14 = 14-Item Resilience Scale; PIL-SF = Purpose in Life Test – Short Form.

Table 4.

*Meaning as a Predictor of Posttraumatic Stress Symptoms After Controlling for the Impact of the Gulf Oil Spill (N = 1119).*

Meaning Model			
Variable	<i>B</i>	<i>SE</i> of <i>B</i>	$\beta$
Impact	8.32	.70	.37***
Resilience	-.85	.11	-.24***
$R^2$ / $R^2$ Change		.20/.06	

Note: For all tables \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; PCL-S = PTSD Checklist – Stressor Specific version; RS-14 = 14-Item Resilience Scale; PIL-SF = Purpose in Life Test – Short Form.

Table 5.

*Gulf Oil Spill Impact, Resilience, and Meaning Predicting Posttraumatic Stress Symptoms (N = 1119).*

	Model 1			Model 2			Model 3		
Variable	<i>B</i>	<i>SE of B</i>	$\beta$	<i>B</i>	<i>SE of B</i>	$\beta$	<i>B</i>	<i>SE of B</i>	$\beta$
Impact	8.66	.73	.37***	8.27	.71	.37***	8.25	.70	.37***
RS-14				-.23	.03	-.23***	-.14	.04	-.14**
PIL-SF							-.50	.15	-.14**
<i>R</i> <sup>2</sup>		.15			.20			.21	

Note: For all tables \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; PCL-S = PTSD Checklist – Stressor Specific version; RS-14 = 14-Item Resilience Scale; PIL-SF = Purpose in Life Test – Short Form.

## LIST OF APPENDICES

## VITA

**Bethany J. Aiena, M.A.**  
Email: [bjaiena@go.olemiss.edu](mailto:bjaiena@go.olemiss.edu)

### ***Education***

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#### Master of Arts

University of Mississippi, August 2014  
Clinical Psychology  
Advisor: Stefan E. Schulenberg, Ph. D.

#### Bachelor of Science, Honors Graduate

Lamar University, Beaumont, TX, May 2011  
Major: Psychology  
Minor: Biology  
Advisor: Jeremy Shelton, Ph. D.

### ***Clinical/Research Experience***

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#### North Mississippi Regional Center, Oxford, Mississippi (2013-2014)

- Graduate therapist at state home for adults with intellectual and developmental disabilities. Duties include providing individual therapy, functional assessments, social skills training, comprehensive intellectual assessments for determination of ICF/IID and HCBS services, composing behavior plans, and updating and composing yearly treatment plans.

#### International Programs, University of Mississippi (2012-2014)

- Co-leader of Cultural Connections Club (C3) supervised by Laura Johnson, Ph.D. Conducted a weekly group for international students to meet to connect with other international students, discuss issues transitioning to the United States, and learn about cultures and diversity. The focus of the group depended on the needs of the members from week to week and it was a hybrid of support group and group therapy.

#### UM Clinical Disaster Research Center, University of Mississippi (2011-2013)

- Graduate Research Assistant and Data team member for the Gulf Oil Spill Behavioral Health Grant under the supervision of Stefan Schulenberg, Ph. D. and the Mississippi Department of Mental Health. Duties included entering, analyzing, and interpreting data; managing all outreach data turning in by state mental health agencies funded by the grant; preparing data for quarterly reports; and assisting in development of research articles concerning the clinical population served by the mental health agencies. Current projects

include researching disaster preparedness at the University of Mississippi and assisting UM Incident Response Team in developing research-informed preparedness procedures.

Meaning in Life Research Lab, University of Mississippi (2011-Present)

- Graduate Research Assistant under the supervision of Stefan Schulenberg, Ph. D. Duties include entering, analyzing, and interpreting data collected from projects pertaining to meaning/purpose in life, PTSD, suicidality, and disasters; supervising undergraduates in presentations/honor's theses; and providing ad hoc reviews of literature including book chapters and journal articles in the fields of conduct disorder, assessment, telehealth, and computer-based therapy

Psychological Services Center, University of Mississippi (Summer 2012-Present)

- Graduate therapist under the supervision of Scott Gustafson, Ph.D., Stefan Schulenberg, Ph.D., and John Young, Ph. D. Duties include conducting intake assessments, developing treatment plans, providing therapy, and preparing client process notes and reports.

Lamar University Psychology Department Research Assistant (2008-2011)

- Includes researching experiment topics, data entry for statistical analyses, coding results, running experiments for my research advisor & conducting experiments of my own. Supervised by Dr. Jeremy Shelton, Ph.D.

### **Professional Publications**

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**Aiena, B. J.**, Baczwaski, B. J., Schulenberg, S. E., & Buchanan, E. M. (in press). Measuring Resilience with the RS-14: A Tale of Two Samples. *Journal of Personality Assessment*.

Walters, B. A., Drescher, C. F., Baczwaski, B. J., **Aiena, B. J.**, Darden, M. C., Johnson, L. R., Buchanan, E. M., & Schulenberg, S. E. (2013). Getting active in the Gulf: Environmental attitudes and action following two Mississippi coastal disasters. *Social Indicators Research*.

**Aiena, B. J.**, & Baczwaski, B. J. (2012). A measure of interest to logotherapy researchers: The 14-Item Resilience Scale. *The International Forum for Logotherapy*, 35, 109-110

Schulenberg, S. E., Baczwaski, B. J., & **Aiena, B. J.** (2012). Advancing logotherapy as a science: A research imperative – Part one. *The International Forum for Logotherapy*, 35, 65-72.

Drescher, C. F., Baczwaski, B. J., Walters, A. B., **Aiena, B. J.**, Schulenberg, S. E., & Johnson, L. R. (2012). Coping with an ecological disaster: The role of perceived meaning in life and self-efficacy following the Gulf Oil Spill. *Ecopsychology*, 4, 56-63.

### **Presentations**

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**Aiena, B. J.**, Schulenberg, S. E., & Smith, C. V. (2013, November). *Perceived Meaning, Resilience, and Traumatic Stress Following the Gulf Oil Spill: A Study of Mississippi Coastal Residents Seeking Mental Health Services*. Poster presented at the 47th annual meeting of the Association for Behavioral and Cognitive Therapies, Nashville, TN.

Baczwaski, B. J., **Aiena, B. J.**, Florez, I. A., Tkachuck, M., Smith, C. V., Schulenberg, S. E. (2013, November). *Informing disaster preparedness efforts on a college campus*. Poster presented at the 47th annual meeting of the Association for Behavioral and Cognitive Therapies, Nashville, TN.

**Aiena, B. J.**, Baczwaski, B. J., Buchanan, E. M., & Schulenberg, S. E. (2012, August). *The psychometric properties of the 14-item Resilience Scale (RS-14)*. Poster session to be presented at the 120<sup>th</sup> annual meeting of the American Psychological Association, Orlando, FL.

**Aiena, B. J.**, & Schulenberg, S. E. (2012, September). *The PTSD Checklist: Psychometric properties and considerations with Vietnamese populations*. Poster session to be presented at the annual convention of the Mississippi Psychological Association, Biloxi, MS.

Baczwaski, B. J., Schultz, K. V., **Aiena, B. J.**, Smith, C. V., & Schulenberg, S. E. (2012, August). *Depression, anxiety, stress, and meaning in life among those impacted by the Gulf Oil Spill*. Poster session to be presented at the 120<sup>th</sup> annual meeting of the American Psychological Association, Orlando, FL.

**Aiena, B. J.** (2012, August). Discussant, *Film program and discussion: The Descendants — APA ad hoc Committee on Films and Other Media*. Presented at the annual meeting of the American Psychological Association, Orlando, FL.

**Aiena, B. J.** & Schulenberg, S. E. (2012, February). *Perceived meaning in life as a moderator between posttraumatic stress and suicidality*. Paper presented at the annual meeting of the Mississippi Academy of Science, Hattiesburg, MS.

**Aiena, B. J.**, Jordan, L., & LaFleur, A. (2010, October) *Effects of Socioeconomic Status Mindset on Attractiveness of Potential Mates*. Paper presented at the annual meeting of the Lamar University Student Research Symposium.

### ***Professional Activities***

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Abstract reviewer for APA Division 17: Positive Psychology April 2014

Ad hoc reviewer *Social Indicators Research* 2013

Ad hoc reviewer *Computers in Human Behavior* 2011, 2012

Ad hoc reviewer *Professional Psychology: Research and Practice* 2012, 2013

Ad hoc reviewer *Journal of Clinical Psychology* 2012

Edited three textbook chapters for Jerome Sattler, Ph. D.

### ***Special Training***

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**Vietnamese Cross Cultural Training** – Completion Certification

Supervisor: Genia Crane, Mississippi Coast Interfaith Disaster Task Force

Trained in counseling Vietnamese refugees and Vietnamese Americans.

May, 2012: 3 hours

**American Red Cross Disaster Training in Psychological First Aid** – Completion Certification  
Supervisor: Northwest Mississippi Chapter, Stefan E. Schulenberg, Ph. D.  
Trained in counseling individuals in the immediate aftermath of a disaster  
September, 2011: 6 hours

### ***Service Work***

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- **American Foundation for Suicide Prevention Out of the Darkness Walk Committee Member, Fundraising Co-Chair** (Fall, 2011, 2012, 2013)-Assisted in walk planning, preparation, fundraising, and running the event on the day of the walk
- **Homer Drive Elementary** (2001-2011)-read to and assisted in conducting activities for Preschool Program for Children with Disabilities class

### ***Academic Memberships***

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- **American Psychological Association** (2012-Present) – Student Affiliate
- **Phi Kappa Phi** – Student Vice President (Fall '10-Spring '11) and member
- **Psi Chi** (Psychology Honors Society) – Vice President, President (Spring '09-Spring '11)

### ***Honors and Awards***

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- Ann Shaw Outstanding Student Leader Award, 2010 – competitive award given to one student each year
- President's List – Fall '08-Fall '10; Dean's List – Fall '07-Fall '10

### ***References***

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\*Available upon request.