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## Natural Disasters and Attachment Quality: The Mediating Roles of Self-Compassion and Positive Mental Health

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NATURAL DISASTERS AND ATTACHMENT QUALITY: THE MEDIATING  
ROLES OF SELF-COMPASSION AND POSITIVE MENTAL HEALTH

by

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A Dissertation  
Submitted to the Graduate School,  
the College of Education and Human Sciences  
and the School of Psychology  
at The University of Southern Mississippi  
in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Philosophy

Approved by:

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## ABSTRACT

Emerging adults exposed to natural disasters may develop posttraumatic stress symptoms, mood disorders, and anxiety disorders. Attachment quality has been found to be negatively associated with psychopathology in emerging adult hurricane survivors; however, the mechanisms by which this occurs have not yet been explored fully. Self-compassion may act as a protective factor against developing psychopathology while potentially promoting positive mental health outcomes following hurricane exposure. Furthermore, positive mental health has been identified as a potential resilience resource and may be impacted by attachment quality and self-compassion. The present study investigated the relationships between attachment quality, self-compassion, positive mental health, posttraumatic stress symptoms, emotional distress, and hurricane exposure severity in a sample of emerging adult hurricane survivors ( $N = 453$ ). Participants completed an online questionnaire including a demographic survey, along with measures of hurricane exposure severity, attachment quality, self-compassion, positive mental health, posttraumatic stress symptoms, and emotional distress. Parent-child attachment quality was positively associated with positive mental health and negatively associated with both posttraumatic stress symptoms and emotional distress. These relationships were partially mediated by self-compassion. Self-compassion and positive mental health were found to be serial partial mediators in the relationship between parent-child attachment quality and posttraumatic stress symptoms and emotional distress. Hurricane exposure severity moderated all the mediations. These findings suggest self-compassion and positive mental health may be mechanisms by which the relationship between attachment quality and psychopathology is explained in emerging adult hurricane survivors.

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## DEDICATION

This dissertation is dedicated to my parents, Judy and Bill Teller, and my sister, Britta Teller, who have provided me with endless encouragement and support throughout my education and in the pursuit of my career aspirations. I also wish to extend my gratitude to my friends and mentors who have been a tremendous source of inspiration and motivation.

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## CHAPTER I - INTRODUCTION

The trauma experienced by the survivors of natural disasters can be severe and may also be accompanied by enduring psychopathology (King, Polatin, Hogan, Downs, & North, 2015). Seven catastrophic hurricanes ranging in severity from category 4 to category 5 occurred between August 2017 and October 2019 (Issa et al., 2018; Shao, Gardezi, & Xian, 2018). The survivors of these hurricanes experienced internal stress reactions in addition to immense physical and environmental damages (Shah, Valles, Banu, Storch & Goodman, 2018). Emerging adults exposed to natural disasters may develop psychological problems including Posttraumatic Stress Disorder (PTSD), mood disorders, and anxiety disorders (Davis, Grills-Taquechel, & Ollendick, 2010). Although the exposure to a natural disaster elevates the risk for psychological disorders, not every individual exposed develops psychopathology (McGloin & Widom, 2001). Also, there is variability in the severity and duration of the negative psychological symptoms experienced by emerging adults exposed to natural disasters (Lang, Goulet, & Amsel, 2004). These variations in the psychological impact of traumatic experiences have been found to be related to resilience factors (Peterson & Toler, 1986; Weisz, McCabe, & Dennig, 1994). However, little is currently known as to why some emerging adults appear more resilient than others following natural disaster exposure (Proctor, Fauchier, Oliver, Ramos, & Margolin, 2007).

After a natural disaster, social support systems are disrupted by the displacement of survivors and the family unit becomes the most stable component of the survivors' lives (Baggerly & Exum, 2008; Hovee et al., 2012). Parent-child attachment quality has

been posited as a potential factor that may impact the development and persistence of psychopathology symptoms in emerging adults exposed to traumatic events (Andretta et al., 2015; Hovee et al., 2012). There is substantial evidence to suggest that attachment quality is associated with psychosocial outcomes in emerging adults; however, the mechanisms by which this occurs have not yet been explored fully. One study conducted by Teller (2018), investigating the attachment quality of emerging adult survivors of Hurricane Katrina, found attachment quality to be negatively associated with psychopathology and that these relationships were mediated by maladaptive coping strategies. While adaptive coping was not found to be uniquely associated with attachment quality or psychopathology (Teller, 2018), other more specific adaptive coping strategies, such as self-compassion, may better explain the association between attachment quality and psychological outcomes following a natural disaster. Self-compassion has been found to be independently associated with lower levels of psychopathology in emerging adults and could potentially promote positive mental health outcomes of survivors of natural disasters (Maheux & Price, 2015). Furthermore, positive mental health (i.e., overall well-being) has been posited as a potential resilience resource and may be impacted by attachment quality and self-compassion (Keyes, 2005; Trompetter, Kleine, & Bohlmeijer, 2017). Therefore, the present study investigated self-compassion and positive mental health as potential mediators in the relationships between parental attachment quality and posttraumatic stress symptoms and emotional distress in a sample of emerging adult hurricane survivors. Additionally, hurricane exposure severity was explored as a moderator in the mediations. Increasing the understanding of effective

coping strategies and resilience factors will hopefully inform future intervention efforts for emerging adult hurricane survivors.

### Natural Disasters

Natural disasters are defined as large-scale events involving natural forces resulting in catastrophic and disruptive consequences for individuals and communities (Schulenberg, 2016). There are several types of natural disasters, such as hurricanes, floods, tornadoes, tsunamis, typhoons, fires, and earthquakes (Schulenberg, 2016). The occurrence of natural disasters on earth increased 56% from 1994 and 2005, with an estimated 255 million people being impacted by natural disasters each year between 1992 and 2003 (Baggerly, 2007). Furthermore, over the past few years natural disasters have been occurring around the world at an accelerating frequency (Shultz & Galea, 2017). Studies suggest that 13 to 30 percent of the population of the United States will be exposed to at least one natural disaster in their lifetime (Briere & Elliott, 2000). The psychological and physical impacts of natural disasters have been found to vary depending on the type of natural disaster.

The natural disasters that will be investigated in the proposed study are hurricanes. In addition to strong winds, hurricanes often involve torrential rainfall, tornadoes, and coastal storm surges (Cloos & Ridde, 2018). Hurricanes damage hundreds of thousands of homes, displacing thousands of survivors (Blake & Zelinsky, 2018). In addition to many storm-related fatalities, numerous physical injuries also occur, including abrasions, fractures, lacerations, and insect bites (Blake & Zelinsky, 2018; Shultz & Galea, 2017). Many survivors are exposed to floodwaters contaminated with sewage and other hazardous contaminants (Shultz & Galea, 2017). The presentation and impact of

hurricanes are often complex with prolonged exposure to the disaster increasing the potential for traumatization of the survivors (Shah, Valles, Banu, Storch & Goodman, 2018).

Seven destructive hurricanes ranging in severity from category 4 to category 5 occurred between August 2017 and October 2019, including Hurricane Harvey, Hurricane Irma, Hurricane Maria, Hurricane Florence, Hurricane Michael, Hurricane Dorian, and Hurricane Lorenzo (Issa et al., 2018; Shao, Gardezi, & Xian, 2018). Similar to other hurricanes, the survivors of these seven hurricanes experienced internal stress reactions in addition to the physical and environmental damages (Paek, Niess, Padilla, & Olson, 2018). Due to the recency of these hurricanes, little investigation of the psychological impact of these disasters on the survivors has been conducted (Blake & Fry-Bowers, 2018). Furthermore, few studies have examined psychological impacts of hurricane exposure and potential protective factors that promote resilience in hurricane survivors in the unique developmental stage of emerging adulthood (White et al., 2013). Since these emerging adults are not yet fully autonomous individuals, they may differ in how they experience and react to natural disasters (White et al., 2013). Emerging adulthood has been identified as a developmental period occurring between 18-years to 25-years of age in industrialized societies, during which individuals are transitioning from adolescence to adulthood (Arnett, 2000). During emerging adulthood, these individuals have been described as balancing their search for autonomy with looking to parents for support and comfort (O’Conner, Allen, Bell, Hauser, 1996). These individuals are often living away from their parents for the first time, while they also are likely to still be reliant on their parents for financial and emotional support (White, Carper, Scott,

Middleton, Renk, & Grills-Taquechel, 2014). The experiences occurring during the developmental period of emerging adulthood differ from those experienced by adolescents, who generally reside at their parents' home, and also differs from the experiences of adults, who typically have created their own immediate family and are more established in the community (White et al., 2013; White et al., 2014). Given that millions of emerging adults have been impacted by hurricanes and the frequency and intensity of these natural disasters seems to be increasing, additional knowledge about the psychological consequences of hurricanes on this specific section of the population and potential protective factors is needed. This information could inform future psychological treatment services and aid in the development of effective resiliency promoting interventions for emerging adult hurricane survivors.

#### Impact of Natural Disasters on Psychopathology

Exposure to natural disasters has been consistently found to be associated with the development of psychopathology (David et al., 1996; Galea, Tracy, Norris, & Coffey, 2008; Ironson et al., 1997). Post-Traumatic Stress Disorder (PTSD) has been found to be one of the most prevalent mental health outcomes of natural disasters (Briere & Elliott, 2000). PTSD is described as the presentation of several trauma-related symptoms triggered by a life-threatening experience (Pistoia et al., 2018). Diagnostic criteria for PTSD as identified in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) includes exposure to a traumatic event, occurrence of behavior related to avoidance of trauma-related stimuli, existence of at least one of five intrusion symptoms, negative influences on cognitions and mood, and heightened arousal and reactivity (American Psychiatric Association, 2013). These symptoms must be experienced for a period

exceeding one month (American Psychiatric Association, 2013). Approximately 15% of populations which experience a natural disaster meet the diagnostic criteria for PTSD (Pistoia et al., 2018). Hurricane survivors have been found to experience PTSD-related symptoms of hyperarousal, avoidance, and intrusion (Green et al., 1991; Lowe, Manove, & Rhodes, 2013).

The characteristics and severity of the disaster experience have been found to increase the risk for developing PTSD (Galea et al., 2005). Experiencing physical injury, witnessing the injury or death of another person, perceiving a threat to life, and property damage and loss have been associated with more severe and persistent mental health problems following a natural disaster (Jacobs & Harville, 2015). The Conservation of Resources Theory (Hobfoll, 1989) has been used as a theoretical framework for investigating and understanding the impact of natural disasters on survivors' psychopathology and positive mental health outcomes (Palgi, Shrira, Goodwin, Kaniasty, & Ben-Ezra, 2015). Natural disasters cause significant damage to housing, transportation, social support systems, health, and numerous other important resources. According to the Conservation of Resources Theory, individuals are driven to acquire and protect their resources at all times. Resources include objects (i.e., house), energy (i.e., relationships), conditions (i.e., health), and personal characteristics (i.e., coping strategies) that possess value outright or are valued because of the role they play in acquiring and maintain possession of other resources (Hobfoll, 1989). When these resources are perceived to be threatened, are used, or lost, stress is experienced. The Conservation of Resources Theory posits that as the amount of resources lost by an individual as a result of trauma increases, the ability for the individual to successfully adjust decreases (Hamama-Raz, Palgi, Shrira,

Goodwin, Kaniasty, & Ben-Ezra, 2015; Hobfoll, 1989). This decrease in adjustment ability in response to trauma is likely related to the individual needing to use other resources in an effort to reacquire the resources they lost (Hamama-Raz et al., 2015). Several studies have found the loss of resources through a traumatic experience, including hurricanes, earthquakes, and floods, to be predictive of psychological distress (Brown et al., 2013; Hanama-Raz, Palgi, Leshem, Ben-Ezra, & Lavenda, 2017; Sattler et al., 2002).

A study involving survivors of Hurricane Ike found that those with more severe exposure (i.e., experiencing life-threatening circumstances, hurricane-related stressors) reported increased PTSD symptoms (Tracy et al., 2011). A metaanalysis of studies involving survivors of Hurricane Katrina found the experience of fear to be predictive of PTSD development (Chan & Rhodes, 2014). Additionally, loss of a pet, death of a close person, lack of necessary resources (e.g., food, water, clothing), and lack of medical assistance were found to be predictive of psychological distress (Chan & Rhodes, 2014). These results suggest that disaster exposure severity should be taken into consideration when investigating the effects of natural disasters (Jacobs & Harville, 2015).

Posttraumatic stress disorder has been found to be the most frequently experienced psychological disorder following these disaster events; however, PTSD rates and other reported psychopathology differ across studies (Smith & North, 1993). These variations may be due to differences in assessments used, length of time passed since disaster exposure when data collection occurs, or characteristics related to each disaster (David, Mellman, Mendoza, Kulick-Bell, Ironson, & Schneiderman, 1996).

Research studies specifically focused on hurricanes have identified commonly experienced mental health issues following exposure, including depression, anxiety, and posttraumatic stress symptoms (Davis, Grills-Taquechel, & Ollendick, 2010). Following Hurricane Andrew, previously mentally healthy adults reported symptoms related to mental distress at 6 to 12 months following exposure to the natural disaster (David et al., 1996). Half of the sample were found to then meet the criteria for a newly developed psychological disorder, specifically 36% reported PTSD symptoms, 30% experienced major depressive disorder, and 20% reported anxiety-related symptoms. Furthermore, over half of these subjects reported mental health symptoms persisted beyond 6 months after the hurricane (David et al., 1996). Natural disaster survivors who experience posttraumatic stress symptoms also have been found to often report anxiety and depression-related symptomology (Davidson & Foa, 1991; Roberts, Mitchell, Witman, & Taffaro, 2010). The frequent anxiety-related symptoms experienced by emerging adults following natural disaster exposure include excessive anxiety and worry, muscle tension, difficulty concentrating, and restlessness (Vernburg & Varela, 2001). Disaster-exposed emerging adults have been found to report symptoms of depression, including depressed mood, fatigue, feelings of worthlessness, and significant changes in appetite and body weight (Roberts, Mitchell, Witman, & Taffaro, 2010). For example, a study conducted by Kar and Barista (2006) found 39% of the emerging adults who were exposed to a super-cyclone in India experienced anxiety and depression with co-occurring posttraumatic stress symptoms.

Psychopathology may endure for months to years after natural disaster exposure, with emerging adult survivors often experiencing long-term emotional, behavioral, and

academic difficulties (Roberts et al., 2010). Studies have found the long-term continuation of posttraumatic stress symptoms, along with other psychopathology-related symptoms, in emerging adults exposed to natural disasters, including hurricanes (Chan, Lowe, Weber, & Rhodes, 2015), tornadoes (Adams et al., 2014; Adams et al., 2016; Paul et al., 2015; Price, Yuen, Davidson, Hubel, & Ruggiero, 2015), floods (Felton, Cole, & Martin, 2012; Martin, Felton, & Cole, 2015), earthquakes (Derivois, Mersier, Cenat, & Castelot, 2014; Hizil, Taskintuna, Isikli, Kilic, and Zileli, 2009; Pynoos et al., 1998; Zhang et al., 2010), rain storms (Zhen, Quan, Yao, & Zhou, 2016), tsunamis (Pityaratstian, Piyasil, Ketumarn, & Sitdhiraksa, 2015; Vastfjall, Peters, & Slovic, 2014; Wu, 2014), and fires (Braun-Lewensohn, 2014).

Research has identified several factors that have been found to increase the risk of emerging adults developing psychopathology, including severe trauma exposure (Weems et al., 2007), negative affect (Weems et al., 2007), trait anxiety (Lonigan et al., 1994), gender (Shannon et al., 1994; Weems et al., 2007), and coping (Tural et al., 2004). Recently, interest has increased in investigating and identifying protective factors that may promote resilient outcomes in emerging adults. A nurturing and stable relationship with parents has been identified as a protective factor for children and adolescents, with higher parental attachment quality being associated with improved psychological outcomes in youth (Bannink, Broeren, van de Looij–Jansen, & Raat, 2013). A study conducted by Teller (2018) found attachment quality to be related to psychological outcomes of emerging adults. Furthermore, parent-child attachment quality has been posited as a potential factor that may impact the development and persistence of

psychopathology symptoms in emerging adults exposed to traumatic events (Andretta et al., 2015; Hovee et al., 2012; Teller, 2018).

### Attachment

Attachment theory (Bowlby, 1969, 1973) is commonly used to conceptualize the development of relationships between a caregiver and their child (Mikulincer & Orbach, 1995). Furthermore, Bowlby's theory provides a framework for understanding the impact attachment has on an individual's ability to regulate distress (Mikulincer & Orbach, 1995). Bowlby theorized the proximity-seeking behavior exhibited by infants towards their parents is driven by their desire for protection and survival (Bowlby, 1969). When parents are available and responsive to their distressed infant during stressful or threatening experiences, the infant perceives the parents to be a secure and safe base and thus increases the infant's trust in support-seeking as a strategy for regulating their distress (Mikulincer & Shaver, 2005). This secure base also allows the infant to express and process negative emotional states. However, if parents are not reliably providing support to their infant during times of distress, then strategies other than proximity seeking are developed by the infant to assist with their emotional regulation. These secondary attachment strategies often involve avoidance and anxiety.

The infant then uses initial life experiences with their parent to aid in the development of personalized internal working models (IWMs), or representations of their attachment system (Simmons, Gooty, Nelson, & Little, 2009). These inner working models are then used to develop an individual's attachment style, which has been defined as an individual's pattern of expectations of and reactions to others, along with their behaviors and emotional responses to distressing situations (Mikulincer & Shaver, 2005).

The attachment style develops into either secure or insecure depending upon parental caretaking behaviors. Secure attachment style refers to a child whose parents are nurturing and responsive in providing care to them and will then view their parents as dependable during times of distress and develop a self-perception of being deserving of loving care (Ainsworth, Blehar, Waters, & Wall's, 1978; Duchesne & Larose, 2007). The insecure attachment style is categorized as either anxious-ambivalent or avoidant. Anxious-ambivalent attachment style is described as being uncertain of other's responses and having a strong desire for intimacy accompanied by an intense fear of rejection, which develops in response to having parents who vacillate between being attentive and emotionally unavailable (Duchesne & Larose, 2007). Avoidant attachment style is characterized as being distrusting of the intentions of others, while attempting to maintain emotional distance and develops when parents are distant and emotionally unavailable (Duchesne & Larose, 2007). In comparison to individuals with insecure attachment styles, individuals with secure attachment style have been found to be more capable of developing effective coping strategies and building social support systems (Ainsworth et al., 1978; Jones, Cassidy, & Shaver, 2015). While attachment styles are utilized to categorize and understand attachment relationships between parents and young children, the quality of parent-child attachment can be examined throughout lifespan development.

#### *Attachment Quality*

Attachment quality is utilized as a descriptor of the parent-child attachment relationship over the course of development from child to adult (Einav, 2014; O'Connor & Elklit, 2008). Attachment quality refers to the affective and cognitive aspects of the parent-child relationship and the degree to which the child perceives the parent to be a

source of psychological security (Okello, Nakimuli-Mpungu, Musisi, Broekaert, & Derluyn, 2014). Attachment quality is conceptualized in terms of three dimensions, including trust, communication, and alienation (Andretta et al., 2015; Armsden & Greenberg, 1987). The dimension of trust is described as the degree the child perceives respect as being mutual in the relationship with their parent. The communication dimension assesses the amount of comfort that exists with regard to discussing their personal life with their parent. The alienation dimension examines feelings of anger towards and detachment from the parent. Utilizing these three dimensions, high quality parent-child attachment is characterized by high levels of trust, effective communication, and minimal alienation (Hale et al., 2006). In comparison, poor quality attachment is typified by low levels of trust, poor communication, and strong feelings of alienation (Hale et al., 2006). High levels of attachment quality have been found to be associated with lower emotional distress in emerging adults, while lower levels of attachment quality have been associated with depression, anxiety, and stress (Teller, 2018). This finding held for both trauma and non-trauma samples (Teller, 2018).

Evidence has been found that the dimensions of attachment quality significantly affect the socio-emotional functioning of emerging adults (Andretta et al., 2015; Bannink, Broeren, van de Looij-Jansen, & Raat, 2013; Hovee et al., 2012; Milan & Acker, 2014). For example, attachment quality has been found to affect how emerging adults experience empathy, relate to others, and perceive and process social information (Dykas & Cassidy, 2011; Labile et al., 2004). Emerging adults reporting high attachment quality have been found to report more frequently seeking out social support, increased satisfaction with life, and experiencing less distress in response to life events, in

comparison to those with low attachment quality (Armsden & Greenberg, 1987).

Furthermore, high-quality attachment has been associated with improved emotional and academic adjustment (Rice, Fitzgerald, Whaley, & Gibbs, 1995; Vivona, 2000).

As an adolescent, attachment quality is thought to impact both current mental health and the probability of future development of psychopathology (Bannink, Broeren, van de Looij–Jansen, & Raat, 2013). Poorer quality attachment with parents has been found to be associated with greater severity of anxiety symptoms (Hale et al., 2006). Andretta et al. (2015) found that fewer symptoms of depression and anxiety were reported by adolescents and emerging adults with better attachment quality when compared with those with lower quality. Additionally, attachment quality has been found to remain influential during emerging adulthood (Hoeve et al., 2012). For emerging adults, attachment quality has been found to be related to current psychopathology, the probability of development of psychopathology in the future, and functioning in several life domains (Dykas & Cassidy, 2011; Hale et al., 2006). Moderate to high levels of attachment quality have been associated with an increased tendency towards and amounts of prosocial behavior, while lower attachment quality has been linked with increases in internalizing behaviors, defiant behavior, and aggression (Andretta et al., 2015; Diamond & Siqueland, 1995). Furthermore, poor quality has been found to be positively correlated with delinquency and oppositional defiance (Andretta et al., 2015; Hoeve et al., 2012). A more favorable and positive attachment quality with parents has been theorized to act as a protective factor against children and adolescents developing psychopathology (Philbrook & Teti, 2016).

The studies conducted thus far that have investigated the relationship between attachment quality and psychopathology development of individuals impacted by trauma have generally focused on sexual trauma (Stubenbort, Greeno, Mannarino, & Cohen, 2002) or trauma experienced as a result of war (Okello, Nakimuli-Mpungu, Musisi, & Broekaert, 2014). The results from these studies indicate poorer attachment quality is predictive of children and adolescents' development of psychopathology following the traumatic experience (Okello et al., 2014; Stubenbort, Greeno, Mannarino, & Cohen, 2002). One study conducted by Teller (2018), investigated the attachment quality of emerging adult survivors of Hurricane Katrina. This study found attachment quality to be associated with psychopathology-related symptoms, such that low attachment quality was found to be associated with higher levels of depression, anxiety, stress, and posttraumatic stress symptoms.

There is substantial evidence to suggest that attachment quality is associated with psychosocial outcomes in emerging adults; however, the mechanisms by which this occurs have not yet been explored fully. Furthermore, this relationship has only minimally been investigated within the context of natural disaster-related trauma. One mechanism, maladaptive coping, was found to partially mediate the relationship between attachment quality and emotional distress and posttraumatic stress symptoms, suggesting the negative relationship between attachment quality and maladaptive coping may be one mechanism by which the relationship between attachment quality and psychopathology is explained (Teller, 2018). These findings indicate the less communication and trust and more alienation that exists between the emerging adult and their caregiver, the more frequently the emerging adult will use maladaptive coping (Teller, 2018). While

adaptive coping was not found to be uniquely associated with attachment quality or psychopathology (Teller, 2018), other more specific adaptive coping strategies, such as self-compassion, may better explain the association between attachment quality and psychological outcomes following a natural disaster. Furthermore, positive mental health (i.e., overall well-being) has been posited as a potential resilience resource and may be impacted by attachment quality and self-compassion (Keyes, 2005; Trompetter, Kleine, & Bohlmeijer, 2017). Therefore, the present study examined self-compassion and positive mental health as potential mediators in the relationship between attachment quality and posttraumatic stress symptoms and emotional distress outcomes in a sample of emerging adult hurricane survivors.

### Self-Compassion

While the concept of self-compassion has recently been gaining popularity in the field of psychology, it has long been embedded in Eastern spirituality, especially Buddhism (Neff, 2003). Based on Buddhist literature, self-compassion has been defined as the ability to recognize one's own suffering and alleviate these painful feelings in a non-judgmental way through the use of kindness towards oneself (Gilbert & Procter, 2006; Neff, 2003, 2009, 2012). The construct of self-compassion consists of three dimensions including self-kindness, common humanity, and mindfulness (Neff, 2003). The dimension of self-kindness involves the use of a caring understanding attitude when dealing with difficulties, inadequacy, and failures in contrast to being judgmental and self-critical (Castilho, Pinto-Gouveia, & Duarte, 2015). Common humanity refers to the recognition all humans encounter challenges in life and are imperfect, which increases feelings of interconnectedness with others instead of feeling isolated (Neff, 2003).

Mindfulness is described as a receptive state of mind where thoughts and feelings are perceived as they arise as opposed to avoidance or repression (Neff, 2003). A mindful perspective also allows for an individual to be more objective about negative experiences, in contrast to overidentification which refers to becoming overwhelmed and entrenched by subjective views of negative emotions and thoughts (Neff, 2003; Castilho, Pinto-Gouveia, & Duarte, 2015). The three components of self-compassion have a reciprocal relationship in that they enhance one another (Castilho, Pinto-Gouveia, & Duarte, 2015). The interconnections of the components are demonstrated during difficult times involving suffering and distress (Neff, 2003). Self-kindness allows for one to be understanding towards the self, while also remaining open to the suffering one is experiencing. This awareness allows one to accept their suffering and recognize it as part of the human condition, which in turn allows one to be mindful of their painful emotions and thoughts and maintain a nonjudgmental awareness of the experienced suffering (Neff, 2003).

Self-compassion has been found to be positively associated with the personality characteristics of optimism, extraversion, conscientiousness, and positive affect (Neff, Kirkpatrick, & Rude, 2007; Pinto-Gouveia, Duarte, Matos, & Fraguas, 2013). Furthermore, self-compassion has been negatively associated with negative affect and neuroticism (MacBeth & Gumley, 2012). The broaden-and-build theory (Fredrickson, 1998) posits that the negative emotions that accompany a depressed affect restrict an individual's ability to problem solve and take action, while the positive emotions of a positive affect improves cognition and promotes adaptive coping strategies. Self-compassion has been theorized as being an attribute that fosters resilience, as it may

increase adaptive cognition and facilitate additional positive coping strategies (Fredrickson, 2001).

There has been a large variation in how researchers have defined resilience, however its presence has been examined in two main ways. Some researchers have investigated the presence of resilience as the absence of psychopathology (Bradley et al., 2013); however, this approach has been criticized for its lack of providing specific evidence that traits of resilience are the cause for the lack of psychological symptomology (Bannink, Broeren, Van de Looij-Jansen, & Raat, 2013). Additionally, this approach may be excluding some essential aspects of resilience (Bradley et al, 2013). A different approach for investigating resilience has been to examine the presence of effective coping strategies and positive personal traits that have been identified as resilience characteristics in that they moderate posttraumatic symptoms in response to trauma and adversity (Bradley et al., 2013). Resiliency factors have been found to decrease the risk of developing psychological problems following traumatic events (Lang, Goulet, & Amsel, 2004). Hardiness, self-efficacy, and spirituality are a few of the resiliency factors investigated thus far and evidence seems to support self-compassion as an additional resiliency factor (Neff, 2003).

Self-compassion appears to be a resilience factor that works as an adaptive emotion-regulation strategy to improve well-being through the reduction of self-criticism, feeling isolated, avoidance, and rumination (Neff, 2003). A meta-analysis found higher levels of self-compassion to be associated with fewer psychological problems (MacBeth & Gumley, 2012), while lower levels of self-compassion have been found to be associated with recurrent depressive episodes (Ehret, Joormann, & Berking, 2014). Self-

compassion has been found to be associated with decreased anxiety, rumination, and depression (Neff, 2003). In a study conducted by Fong and Loi (2016), self-compassion was found to be associated with a sample of college students' reports of better social and psychological well-being and lower emotional distress. This study also found self-compassion functioned as a mediator in the relationships between daily stress and depression and between negative affect and depression for emerging adults (Loi, 2016).

Self-compassion has been theorized to assist in trauma recovery by promoting self-care behaviors and utilization of social support (Neff, 2003), allowing for the experience of painful emotions and thoughts following trauma exposure so they can be effectively processed (Thompson & Waltz, 2008), decreasing self-criticism and rumination (Gilbert & Proctor, 2006), and allowing for the experience of traumatic memories from a self-distanced perspective (Korss & Ayduk, 2011). Self-compassion has been found to be associated with lower levels of PTSD avoidance symptoms following trauma exposure (Thompson & Waltz, 2008). Adolescent victims of abuse with lower levels of self-compassion were found to have increased likelihood of experiencing psychological distress, substance abuse problems, and suicide attempts (Tanaka et al., 2011). Additionally, self-compassion was found to mediate the relationship between childhood abuse and future emotional dysregulation in adolescents (Vettese et al., 2011). A study conducted by Kaurin, Schonfelder, and Wessa (2018) found self-compassion moderated the relationship between self-criticism and depression for firefighters who had experienced numerous potentially traumatic events. These results provided evidence supporting that self-compassion may act as a protective resilience factor against the

development of psychopathology following trauma exposure; however, there is a paucity of research examining this relationship in the context of natural disaster-related trauma.

### *Self-Compassion and Natural Disasters*

Following exposure to a natural disaster, individuals have been found to develop posttraumatic stress symptoms that vary in severity and duration (Fu & Gil-Rivas, 2010). While some individuals quickly recover with minimal impact on their daily functioning, others are debilitated by their symptoms and may never fully recover (Lang, Goulet, & Amsel, 2004). These variations in the psychological impact of traumatic experiences have been found to be related to resilience factors demonstrated through coping behaviors (Peterson & Toler, 1986; Weisz, McCabe, & Dennig, 1994). In order for an individual to efficiently navigate and adapt to their environment and reduce possible psychopathology development, they must utilize effective coping mechanisms (McEwen, 1999; Nielson, 2003). Adaptive coping strategies are thought to neutralize the negative effects of stress, while also fostering psychological well-being (Lazarus & Folkman, 1996). Those who possess a high level of resilience factors have been found to have a better ability to cope with traumatic life events (Bradley et al., 2013).

Self-compassion has been described as an adaptive coping mechanism which could be a potential resilience factor against PTSD following a traumatic experience (Maheux & Price, 2015). Thus far, only one published study has investigated self-compassion in the context of natural disaster exposure (Zellar, Yuval, Nitzan-Assayag, and Bernstein, 2015). Zellar, Yuval, Nitzan-Assayag, and Bernstein (2015) conducted a study which investigated the relationship between self-compassion and posttraumatic stress symptoms in adolescents who experienced the Mount Carmel Forest fire natural

disaster. Self-compassion was found to be predictive of lower levels of posttraumatic stress symptoms at 30 days, three months, and six months following the disaster. These findings provide evidence suggesting self-compassion may be a protective factor against psychopathology related to natural disaster exposure. Zeller et al. (2015) proposed that self-compassion may be protective against trauma related stress because individuals who demonstrate more self-compassion may be more likely to recognize the need for and engage in self-care, facilitate the processing of trauma-related emotions and thoughts, engage in less self-blame, and remember the traumatic experience from a more decentered perspective. The relationship between self-compassion and psychopathology needs to be further clarified through investigating the variables in other trauma exposed samples. Self-compassion has yet to be investigated in the context of hurricane exposure. As natural disasters differ in their impacts, the potential protective function of self-compassion needs to be investigated for hurricane specific trauma exposure.

#### *Self-Compassion and Attachment*

While several studies have found relationships between self-compassion and psychological outcomes, little investigation into the origins of self-compassion has occurred (Pepping, Davis, Donovan, & Pal, 2015). It has been theorized that self-compassion originates from early parent-child interactions (Gilbert & Proctor, 2006). Attachment theory has been proposed as a potential framework for conceptualizing the development of self-compassion (Neff & McGeehee, 2010). Neff (2011) hypothesized that parents' ability to be responsive and supportive aids in a child's development of abilities to exhibit self-compassion and self-soothe when distressed. In contrast, it was posited that children who experience their parents as unreliable or rejecting may be more

likely to be self-critical and less self-compassionate (Neff & McGeehee, 2010). In support of these hypotheses, recollections of a generally positively functioning family and supportive mother were found to be associated with more self-compassion (Neff & McGeehee, 2010). Additionally, those who reported memories of overprotective and rejecting parents were found to be more self-critical when compared to individuals who reported experiencing warm parents (Irons, Gilbert, Baldwin, Baccus, & Palmer, 2006). Support and warmth are indicative of attachment quality, and this may be involved in shaping self-compassion (Mikulincer & Shaver, 2007; Neff, 2011). In a potentially similar process, an insecure attachment style has been found to be associated with reduced self-compassion (Raque-Bogdan, Ericson, Jackson, Martin, & Bryan, 2011).

The emotional availability characteristic of parents with high attachment quality may assist in children developing self-compassion, while the emotional distance often exhibited by parents with low attachment quality may hinder self-compassion development and instead encourage children to be more self-critical (Neff & McGee, 2010). To date, the only published study specifically investigating the connection between parent-child attachment quality and self-compassion found that adolescents with higher attachment quality reported higher levels of self-compassion, in comparison to those with poorer attachment quality (Jiang, You, Zheng, & Lin, 2017). Considering the potential benefits of self-compassion, the relationship between attachment quality and self-compassion needs to be examined for emerging adults and in relation to natural disasters. While the current study anticipated that parent-child attachment quality would be related to self-compassion in emerging adult hurricane survivors, hurricane exposure severity was hypothesized to influence this relationship. The Conservation of Resources

Theory (Hobfoll, 1989) along with previous findings that increased loss of resources and severity of exposure to a natural disaster to be predictive of psychological distress, seem to indicate that disaster exposure severity should be taken into consideration when investigating the effects of natural disasters (Chan & Rhodes, 2014; Sattler et al., 2002). The loss and threat to resources resulting from hurricane exposure may significantly hinder an individual's ability to utilize self-compassion. Furthermore, more severe hurricane exposure may disrupt the relationship between parent and child and thus decrease attachment quality (Jones, Cassidy, & Shaver, 2015; Sherman et al., 2016). Therefore, the present study predicted that hurricane exposure severity, including resource threat and loss, would moderate the relationship between parent-child attachment quality and self-compassion in emerging adult hurricane survivors, such that those who experienced higher hurricane exposure severity would have a weaker connection between attachment quality and self-compassion.

Additionally, self-compassion may be a mechanism through which attachment quality impacts the development and maintenance of the potential resilience factor, positive mental health.

### Positive Mental Health

While mental health has been viewed in the past as the absence of psychopathology, over the past several years there has been growing support for defining mental health as a positive state that goes beyond the mere absence of emotional disorders (Westerhof & Keyes, 2010). Mental health has been defined by the World Health Organization as “a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and

fruitfully, and is able to make a contribution to his or her community” (World Health Organization, 2005, p.2). There have been two main areas in the research of well-being, which are the hedonic and eudaimonic traditions. The hedonic tradition, corresponding with emotional well-being, describes well-being as involving feelings related to happiness or positive affect, satisfaction with life, and interest in life (Keyes, 2007; Lamers, Glas, Westerhof, & Bohlmeijer, 2012). The eudaimonic tradition, which encompasses psychological well-being and social well-being, includes elements involved in optimal psychological and social functioning and striving to realize one’s utmost potential (Westerhof & Keyes, 2010). Psychological well-being, consisting of the individual components of the eudaimonic tradition, focuses on optimal intrapersonal functioning (Ryff, 1989). Psychological well-being has been theorized to comprise six dimensions, including self-acceptance (i.e., accepting attitude toward self in the past and present), autonomy (i.e., guiding self by one’s internal standards), purpose in life (i.e., goals and beliefs that provide a meaning and direction in one’s life), personal growth (i.e., insight into one’s self-development potential), environmental mastery (i.e., capacity to navigate the environment based on one’s needs), and positive relations with others (i.e., possessing satisfying personal relationships involving the expression of empathy and intimacy) (Ryff, 1989; Westerhof & Keyes, 2010). Social well-being, consisting of the interpersonal aspects of the eudaimonic tradition, focuses on optimal functioning within a community (Keyes, 1998). Social well-being includes the five dimensions theoretically necessary for one to prosper socially: social coherence (i.e., ability to understand what is occurring in society), social actualization (i.e., belief in the potential of the community to evolve positively), social acceptance (i.e., possessing a positive

attitude towards others and the acknowledgement of their difficulties), social contribution (i.e., feeling one's actions assist and are valued by community), and social integration (i.e., feeling one belongs to a community) (Keyes, 1998).

Positive mental health has been conceptualized as a combination of emotional well-being, psychological well-being, and social well-being (Keyes, 2002; Lamers, Westerhof, Kovacs, & Bohlmeijer, 2012). Keyes (2002) developed a mental health continuum which includes the three mental health categories of flourishing, languishing, and moderately mentally healthy (Keyes, 2002). Flourishing refers to complete positive mental health, and is described as high levels of emotional, psychological, and social well-being (Keyes, 2002). Languishing, or incomplete positive mental health, is characterized by low levels of emotional, psychological, and social well-being (Keyes, 2002). Moderately mentally healthy describes individuals who are neither flourishing nor languishing (Keyes, 2002).

Researchers have found evidence that positive mental health and psychopathology function on two distinct yet related continua, with one continuum indicating the presence or absence of mental health and a second continuum indicating the presence or absence of psychopathology (Keyes, 2002; Keyes, 2005; Lamers et al., 2011; Westerhof & Keyes, 2009). This two continua model of mental health was investigated by Keyes (2005) through the use of data from the research study on Midlife Development in the United States (MIDUS). The MIDUS study included data from 3,032 adults ranging in age from 25 to 74-years-old. Keyes (2005) found a confirmatory factor model with the two related factors of positive mental health and psychopathology to be a superior fit in comparison to a single-factor model. The two continua model of mental health has been replicated in

several studies involving participants with varying demographics (Keyes, 2006; Keyes et al., 2008; Suldo & Shaffer, 2008). Keyes (2005) also found there were some participants who reported psychopathology and a moderate level of positive mental health.

Furthermore, the study found that individuals with low positive mental health did not always experience psychopathology (Keyes, 2005). These findings support the two continua model of mental health and indicate positive mental health and psychopathology do not exist as exact opposites. Thus, individuals with psychopathology may possess varying levels of positive mental health (Keyes et al., 2008; Lamers et al., 2012).

Increased positive mental health has been posited as a potential protective factor against the incidence of mood and anxiety disorders (Schotanus-Dijkstra et al., 2017). Higher levels of positive mental health have been found to be associated with reduced occurrence of depressive and anxiety disorders over the course of ten years (Schotanus-Dijkstra et al., 2017). Three studies involving a female only sample found positive mental health to be the most influential predictor of recovery from an anxiety disorder (Lukat et al., 2017; Trumpf et al., 2009; Vriends et al., 2007). Keyes, Dhingra, and Simoes (2010) found improvement in positive mental health to be predictive of decreases in psychopathology, while declines in positive mental health predicted increases in psychopathology.

Additionally, positive mental health has been posited as a potential resilience resource (Keyes, 2005). Several studies have consistently found that adults and adolescents exhibiting anything less than complete mental health (i.e., high positive mental health without psychopathology) report increased physical disease, lower work productivity, and poorer psychosocial functioning (Keyes, 2002, 2004, 2005, 2006,

2007). The level of positive mental health has been found to be predictive of the psychosocial functioning level of adults with psychopathology, such that individuals with high positive mental health who experience psychopathology symptoms have been found to have better psychosocial functioning in comparison to those with moderate positive mental health, who in turn demonstrate better psychosocial functioning than individuals with poor positive mental health and psychopathological symptoms (Keyes, 2007). Additionally, combined diagnoses of both positive mental health and psychopathology have been found to be more predictive of psychosocial functioning in comparison to a single diagnosis, thus supporting that positive mental health and psychopathology are complementary (Keyes, 2002, 2005; Keyes & Grzywacz, 2005; Lamers et al., 2011). These findings indicate the importance of including an assessment of positive mental health when assessing for psychopathology (Lamers et al., 2011).

#### *Positive Mental Health and Natural Disasters*

As discussed earlier, the Conservation of Resources Theory (Hobfoll, 1989) has been used as a theoretical framework for investigating and understanding the impact of natural disasters on survivors' positive mental health outcomes (Palgi, Shrira, Goodwin, Kaniasty, & Ben-Ezra, 2015). The Conservation of Resources Theory posits that as the amount of resources lost as a result of trauma increases, the individual's ability to successfully adjust decreases (Hobfoll, 1989; Hamama-Raz, Palgi, Shrira, Goodwin, Kaniasty, & Ben-Ezra, 2015). Evidence for this theory was provided by a study investigating the impact of resource loss on the subjective well-being of survivors of Super Typhoon Haiyan, which found subjective well-being to be significantly predicted by resource loss (Hamama-Raz, Palgi, Leshem, Ben-Ezra, & Lavenda, 2017). While the

subjective well-being measure used in the study did not examine all three types of well-being encompassed by positive mental health, it is plausible that these same findings may apply to the resource loss resulting from hurricanes. Therefore, the loss and threat to resources resulting from hurricane exposure may significantly negatively impact an individual's positive mental health.

### *Positive Mental Health and Self-Compassion*

Identified factors that have been found to predict positive mental health include social support (Keyes, Myers, & Kendler, 2010), demographic characteristics (i.e., gender, age, and marriage; Lim, Go, Shin, & Cho, 2013), and personality traits (Joshanloo & Nosratabadi, 2009). Additionally, self-compassion has been proposed to play a role in the development and maintenance of positive mental health. Research has found self-compassion to be positively associated with several factors related to positive mental health, including optimism, positive affect, life satisfaction, personal initiative, and happiness (Barnard & Curry, 2011; Neff et al., 2007; Zessin et al., 2015). With self-compassion involving kindness towards self, feelings of inter-connectedness with others, and a balanced awareness and outlook, self-compassion has been found to contribute to the development of positive mental health resources, including self-acceptance, positive social interactions, environmental mastery, and positive emotions (Keyes, 2005; Neff et al., 2007; Trompetter, Kleine, & Bohlmeijer, 2017).

It has been theorized that the development of positive mental health is a process of balancing the positive and negative experiences encountered in life (Diener & Ryan, 2009). The evaluations of life experiences are thought to determine levels of positive mental health, such that positive mental health is increased by positive circumstances and

decreased by negative experiences (Zessin, Dickhauser, & Garbade, 2015). The self-compassion components of self-kindness, common humanity, and mindfulness may assist in lessening the effects of negative experience evaluations (Zessin, Dickhauser, & Garbade, 2015). This potential decrease in the impact of negative experiences facilitated by self-compassion may enable a more positive outlook and evaluation of life, which may increase positive mental health. Furthermore, self-compassion could act as a protective factor against negative events through cognitive emotional reframing (Zessin, Dickhauser, & Garbade, 2015). The relationship between self-compassion and positive mental health needs further examination, particularly in the context of natural disaster-related trauma.

#### *Positive Mental Health, Self-Compassion, and Attachment*

Several studies have found good family functioning, attachment security, and maternal support to be associated with positive mental health (Barber & Harmon, 2002; Cooper, Shaver, & Collins, 1998; Crittenden, Claussen, & Sugarman, 1994; Steinberg, 1990). Self-compassion may be a mechanism through which familial aspects impact well-being. Healthy relationships with family members may reflect an individual relating to themselves in a more positive manner (i.e., self-compassion), which may in turn influence positive mental health. Securely attached adolescents with healthy family dynamics have been found to possess higher levels of self-compassion than those with more problematic family environments (Neff & McGee, 2010). Therefore, supportive relationships with parents may impact positive mental health by fostering self-compassion, while dysfunctional relationships with parents may negatively impact mental health by promoting self-criticism (Neff & McGee, 2010).

The interactions between natural disaster exposure, attachment quality, self-compassion, and positive mental health have yet to be investigated. Therefore, the current study investigated the possible mediating role of self-compassion in the relationship between attachment quality and positive mental health for emerging adult hurricane survivors. Furthermore, it was hypothesized that self-compassion and positive mental health would act as serial mediators in the relationship between attachment quality and the outcomes of posttraumatic stress symptoms and emotional distress.

### Present Study

Seven catastrophic hurricanes ranging in severity from category 4 to category 5 occurred between August 2017 and October 2019. The survivors of these hurricanes experienced internal stress reactions in addition to the immense physical and environmental damages (Shah, Valles, Banu, Storch & Goodman, 2018). Due to the recency of these hurricanes, little investigation of the psychological impact of these disasters on the survivors has been conducted (Blake & Fry-Bowers, 2018). Furthermore, few studies have examined psychological impacts of hurricane exposure and potential protective factors that promote resilience in hurricane survivors in the unique developmental stage of emerging adulthood (White et al., 2013). Considering the high prevalence of emerging adults impacted by hurricanes and that the frequency and intensity of these natural disasters seems to be increasing, additional knowledge about the psychological consequences of hurricanes and potential protective factors for emerging adults is needed. Similar to adult and adolescent populations, emerging adults exposed to natural disasters may develop psychopathology including posttraumatic stress symptoms, depression, and anxiety (Davis, Grills-Taquechel, & Ollendick, 2010); however, there is

variability in the severity and duration of the negative psychological symptoms experienced (Lang, Goulet, & Amsel, 2004). These variations in the psychological impact of traumatic experiences have been found to be related to resilience factors (Peterson & Toler, 1986; Weisz, McCabe, & Dennig, 1994); however, little is currently known as to why some emerging adults appear more resilient than others following natural disaster exposure (Proctor, Fauchier, Oliver, Ramos, & Margolin, 2007).

Parent-child attachment quality has also been posited as a potential factor that may impact the development and persistence of psychopathology symptoms in emerging adult natural disaster survivors (Maheux & Price, 2015). Higher parental attachment quality was found to be associated with improved psychological outcomes in emerging adult survivors of Hurricane Katrina (Teller, 2018), but has not yet been studied in emerging adult survivors of other, more recent hurricanes. There is substantial evidence to suggest that attachment quality is associated with psychosocial outcomes in emerging adults; however, the mechanisms by which this occurs have not yet been explored fully. One possible mechanism is self-compassion which has been found to be independently associated with attachment and a decreased risk of psychopathology in emerging adults (Maheux & Price, 2015); however, the relationship between these variables needs clarification through further investigation. Additionally, it is also unclear the extent to which self-compassion may mediate the relationship between attachment quality and psychopathology. Also, positive mental health (i.e., overall well-being) has been identified as a potential resilience resource and may be impacted by attachment quality and self-compassion (Keyes, 2005; Trompetter, Kleine, & Bohlmeijer, 2017) and which can exist independent of or in conjunction with psychopathology (Keyes, 2002).

Furthermore, evidence has been found that higher positive mental health is associated with lower occurrence of anxiety and depressive disorders and that positive mental health can positively impact recovery from anxiety disorders (Keyes et al., 2010; Schotanus-Dijkstra, Keyes, de Graaf, & ten Have, 2019; Schotanus-Dijkstra et al., 2017). It was hypothesized in the present study that a high-quality parent-child attachment may promote the use of self-compassion by the emerging adult child, which would in turn promote positive mental health.

The relationships between parent-child attachment quality, self-compassion, positive mental health, posttraumatic stress symptoms, and emotional distress have only been minimally investigated and have yet to be fully explored in a sample of participants who have experienced a natural disaster. Based on previous findings that attachment quality is positively associated with several resilience factors (Mikulincer & Shaver, 2007; Neff, 2011), it was hypothesized that attachment quality would be positively correlated with self-compassion and positive mental health. Considering past research results finding self-compassion is negatively associated with psychopathology (Pepping et al., 2015), it was posited that self-compassion would be negatively correlated with emotional distress and posttraumatic stress symptoms and positively correlated with positive mental health. Furthermore, the present study investigated self-compassion as a mediator in the relationship between parental attachment quality and positive mental health, posttraumatic stress symptoms, and emotional distress in a sample of emerging adult hurricane survivors. Additionally, self-compassion and positive mental health were examined as possible serial mediators in the relationship between parent-child attachment quality and posttraumatic stress symptoms and emotional distress. Finally, it was

hypothesized that hurricane exposure severity would moderate the relationship between attachment quality and self-compassion, along with the mediation analyses in a sample of emerging adult hurricane survivors.

#### Research Questions and Hypotheses

*Question 1:* Is parent-child attachment quality related to self-compassion in emerging adult hurricane survivors?

*Hypothesis 1:* It is hypothesized that parent-child attachment quality will be positively associated with self-compassion in emerging adult hurricane survivors.

*Question 2:* Does self-compassion partially mediate the relationships between parent-child attachment quality and the outcome variables of emotional distress and posttraumatic stress symptoms in emerging adult hurricane survivors?

*Hypothesis 2:* It is hypothesized that self-compassion will partially mediate the relationship between parent-child attachment quality and the outcome variables of emotional distress and posttraumatic stress symptoms in emerging adult hurricane survivors, such that better parent-child attachment quality will be positively associated with self-compassion, which will in turn be negatively associated with both emotional distress and posttraumatic stress symptoms.

*Question 3:* Is parent-child attachment quality related to positive mental health in emerging adult hurricane survivors?

*Hypothesis 3:* It is hypothesized that parent-child attachment quality will be positively associated with positive mental health in emerging adult hurricane survivors.

*Question 4:* Is self-compassion related to positive mental health in emerging adult hurricane survivors?

*Hypothesis 4:* It is hypothesized that self-compassion will be positively associated with positive mental health in emerging adult hurricane survivors.

*Question 5:* Does self-compassion partially mediate the relationship between parent-child attachment quality and positive mental health in emerging adult hurricane survivors?

*Hypothesis 5:* It is hypothesized that self-compassion will partially mediate the relationship between parent-child attachment quality and positive mental health in emerging adult hurricane survivors, such that better parent-child attachment quality will be positively associated with self-compassion, which will in turn be positively associated with positive mental health.

*Question 6:* Will self-compassion and positive mental health serially mediate the relationships between parent-child attachment quality and the outcomes variables of emotional distress and posttraumatic stress symptoms in emerging adult hurricane survivors?

*Hypothesis 6:* It is hypothesized that self-compassion and positive mental health will serially mediate the relationships between parent-child attachment quality and the outcome variables of emotional distress and posttraumatic stress symptoms in emerging adult hurricane survivors, such that better parent-child attachment quality will be positively associated with self-compassion, which will in turn be positively associated with positive mental health, which will then be negatively associated with both emotional distress and posttraumatic stress symptoms.

*Question 7:* Does hurricane exposure severity moderate the relationship between parent-child attachment quality and self-compassion in emerging adult hurricane survivors?

*Hypothesis 7:* It is hypothesized that hurricane exposure severity will moderate the relationship between parent-child attachment quality and self-compassion in emerging adult hurricane survivors, such that the relationship between parent-child attachment quality and self-compassion will be weaker for emerging adults who reported higher severity of hurricane exposure in comparison to those who report lower severity of exposure.

*Question 8:* Does hurricane exposure severity moderate the mediation relationships involving parent-child attachment quality as the predictor, self-compassion as the mediator, and the outcome variables of emotional distress, posttraumatic stress symptoms and positive mental health in emerging adult hurricane survivors?

*Hypothesis 8:* It is hypothesized that hurricane exposure severity will moderate the mediation relationships, such that the relationship between parent-child attachment quality and self-compassion, along with the mediation relationships will be weaker for emerging adults who reported higher severity of hurricane exposure in comparison to those who report lower severity of exposure.

*Question 9:* Does hurricane exposure severity moderate the serial mediation relationships involving parent-child attachment quality as the predictor, self-compassion and positive mental health as the serial mediators, and the outcome variables of emotional distress and posttraumatic stress symptoms in emerging adult hurricane survivors?

*Hypothesis 9:* It is hypothesized that hurricane exposure severity will moderate the sequential mediation relationships, such that the relationship between parent-

child attachment quality and self-compassion, along with the serial mediation will be weaker for emerging adults who reported higher severity of hurricane exposure in comparison to those who report lower severity of exposure.

## CHAPTER II - METHODS

### Participants

Four hundred fifty-three emerging adults who were directly impacted by a category 4 or 5 hurricane occurring between August 2017 and October 2019 participated in the present study. The sample included 228 male and 225 female emerging adults, ranging in age from 18 to 25 years old ( $M = 23.52$ ,  $SD = 1.59$ ). A little under half of participants identified their race as Asian-American (45.3%), 40.6% identified as White/non-Hispanic, 7.5% identified as Black/African American, 3.3% identified as Native American, and 3.3% identified as Other. At the time of the survey, most of the participants identified as employed (82.3%), with the remaining participants identifying as unemployed (4.0%), a freshman college student (2.2%), sophomore college student (2%), junior college student (2.9%), senior college student (5.3%), or graduate student (1.3%). Two hundred eighty-eight participants indicated their mother as their primary caregiver (63.6%), 122 identified their father (26.9%), 28 identified their grandfather or other male family member (6.2%), 10 identified their grandmother or other female family member (2.2%), and five selected “other” (1.1%). Over half of the participants described their primary family structure as including married biological parents during their childhood (59.2%).

Participants reported being directly impacted by one or more of the seven category 4 or 5 hurricanes that occurred in the three years prior to data collection, including Hurricane Florence (17%; impacted southeastern US), Hurricane Michael (12.4%; impacted Gulf Coast), Hurricane Harvey (24.5%; impacted southern US), Hurricane Irma (20.3%; impacted southeast US and Caribbean islands), Hurricane Maria

(15.2%; impacted Puerto Rico, Dominican Republic, Dominica, southeastern US), Hurricane Dorian (8.2%; impacted The Bahamas, Puerto Rico, eastern US, Eastern Canada), and Hurricane Lorenzo (2%; impacted France, Cape Verde, West Africa, British Isles). The majority of participants indicated they evacuated the area impacted by the hurricane prior to the hurricane making landfall (67.8%), while the remaining participants (32.2%) reported they did not evacuate. The average rating of how severely the participants were impacted by the hurricane on a continuous scale ranged from 1 to 100 was 60.88 ( $SD = 23.94$ ). The majority of participants reported being slightly to moderately impacted by the hurricane (70%), while 15.2% indicated being severely impacted and 14.8% being minimally impacted. Most participants (72%) endorsed the HURTE perceived life threat item “At any time during the hurricane, did you think that you might die?” Regarding previous exposure to potentially traumatic experiences beyond hurricane exposure, 48 participants endorsed experiencing a fire or explosion, 93 experienced a transportation accident, 55 experienced a serious accident, 48 were exposed to a toxic substance, 83 experienced physical assault, 49 experienced assault with a weapon, 61 experienced sexual assault, 60 experienced an “other unwanted sexual experience”, 53 experienced combat, 42 experienced captivity, 63 experienced life-threatening illness or injury, 52 experienced “severe human suffering”, 53 experienced sudden, violent death, 93 experienced sudden, unexpected death of someone close, 69 experienced serious injury or death of someone close, and 97 experienced “any other very stressful experience”.

## Procedures

Following approval from the University of Southern Mississippi's Institutional Review Board (approval letter located in Appendix A, renewal located in Appendix B), participants were recruited through Amazon's Mechanical Turk (MTurk), which is a web-based participant recruitment system that has been consistently found to gather diverse samples and produce quality data for psychometric measures (Buhrmester, Kwang, & Gosling, 2011; Kees, Berry, Burton, & Sheehan, 2017; Thomas, Lund, & Bradley, 2015). Through MTurk, a link was made available for participants to the Qualtrics secured website containing the informed consent form and questionnaires. Upon reaching the Qualtrics survey the participants were prompted to read and electronically sign an online informed consent form (Appendix C). After providing consent for participation in the study, participants completed the demographic questionnaire, which also included one item inquiring which of the hurricanes they experienced, along with two items inquiring about the participants' degree of hurricane exposure. Due to the overrepresentation of male participants in the initial data collection, a second round of data collection was conducted to recruit additional female subjects. A total of 2,166 participants responded to the online questionnaire. The 611 participants that did not meet the stated age requirements, along with the 228 participants who endorsed that they were not exposed to one of the listed hurricanes and/or an exposure severity of 0 ("not at all impacted"), were diverted to the end of the survey and not compensated as they did not meet the stated required criteria for study participation. Participants who indicated that they were exposed to one of the listed hurricanes and endorsed the severity of their exposure to the hurricane was at least a "1" on a 5-point Likert scale (e.g. 0 ("not

impacted at all”) to 4 (“Severely Impacted”), were diverted to the HURTE questionnaire followed by the six other measures. The six measures following the HURTE were presented in a randomized order in an effort to control for possible order effects. Quality assurance checks included two directed response items that required a specified answer (e.g. Answer “Definitely Not”) and the recording of survey completion time to assist in identifying participants who may have been responding randomly or carelessly. A total of 874 of the participants answered either one or both of the validity indicators incorrectly and were diverted to the end of the survey, did not complete the entire questionnaire, or completed the survey too quickly. In an effort to preclude respondents from completing the survey multiple times, subjects were unable to complete the survey more than once from each IP address. The participants who completed the entire survey received the designated incentive of 25 cents through the MTurk website, which is consistent with typical MTurk compensation (Buhrmester, Kwang, & Gosling, 2011). Therefore, data from only the remaining 453 participants were included in the data analyses.

## Measures

### *Demographic Questionnaire*

The researcher created a self-report demographic form to be utilized for the present study that gathered basic demographic information about the participants as well as their current living situations, marital status, highest level of education achieved, family income, and basic demographic information about their family. Additionally, items were included which inquired about which hurricane the participants directly experienced and the severity of their exposure to the hurricane.

### *Hurricane Exposure*

Since variability has been found in the amount and type of trauma exposure that was experienced by hurricane survivors and because trauma exposure can be related to mental health outcomes (Jones, Cassidy, & Shaver, 2015), the Hurricane-related Traumatic Experiences (HURTE; Vernberg et al., 1996) questionnaire was utilized to assess the participants' hurricane-related traumatic experiences. A potential experience is described in each of the items and participants endorse or deny if they had the experience by answering "Yes" or "No." The HURTE includes the three sections of life threat, immediate loss and disruption, and ongoing loss and life disruption. The life threat section includes 7-items containing content related to life-threatening events that may have occurred during the hurricane (e.g. "Did you get hit by anything falling or flying during the hurricane?"). This section yields a Perceived Life Threat score, ranging from 0 to 1, from the item "At any time during the hurricane, did you think you might die?", along with an Actual Life Threat score calculated from responses to six of the items and ranging from 0 to 6. The immediate loss and disruption section includes 10-items, which evaluates loss and disruption following the hurricane (e.g. "Was your home damaged badly or destroyed by the hurricane?"), and yields an Immediate Loss/Disruption total score ranging from 0 to 10. The ongoing loss and life disruption section contains 6-items assessing loss and disruption related to the hurricane (e.g. "Is there any damage to your house or property from the hurricane that still needs to be fixed?"), and yields an Ongoing Loss and Disruption total score ranging from 0 to 6. The HURTE has been used in multiple studies investigating hurricane exposure (La Greca, Lai, Llabre, Silverman, Vernberg, & Prinstein, 2013; Weems et al., 2010; Yelland et al., 2010). In a recent study,

internal consistency for the measure was found to be adequate with an alpha coefficient of .73 (Teller, 2018). For the current study, the internal consistency coefficient was .88. The HURTE total score was investigated as a potential moderator in the mediation analyses for the present study.

#### *Inventory of Parent and Peer Attachment*

Parent-child attachment quality was evaluated using the Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987). The participants only responded to the parent attachment section of the IPPA, which assesses the communication, trust, and alienation aspects of the participant's attachment to their primary caretaker. This method of administering solely the parent attachment section of the IPPA has been utilized in several studies of parent-child relationships (Otis, Huebner, & Hills, 2016; Eijck, Branje, Hale, & Meeus, 2012). The measure's items are rated on a 5-point Likert scale ranging from 1 (almost never true) to 5 (almost always true). The IPPA contains three subscales, including communication, trust, and alienation and yields a total score, along with three subscale scores. The quality of parent-child attachment is based on the total score, with higher scores indicating a more favorable and secure attachment. All scores were included in the statistical analyses of the present study. The IPPA has been found to be valid and reliable in several studies (Eijck et al., 2012; Vivona, 2000), with one recent study finding reliability coefficients ranging from .93 to .94 (Teller, 2018). For the present study, the internal consistency coefficient for the total score was .89 and the consistency coefficients for the subscales of trust, communication, and alienation were .88, .87, and .80 respectively.

### *Mental Health Continuum-Short Form*

Positive mental health was assessed using the Mental Health Continuum-Short Form (MHC-SF; Keyes et al., 2006), which contains 14-items rated on a 6-point Likert scale ranging from 0 (never) to 5 (every day). The measure contains three subscales, each with items related to a specific type of well-being, which when combined together determine positive mental health. The subscale of emotional well-being contains three items (e.g., How often during the past month did you feel happy), the subscale of psychological well-being contains six items (e.g., How often during the past month did you feel good at managing the responsibilities of your daily life), and the subscale of social well-being contains five items (e.g., How often during the past month did you feel that people are basically good). Responses are calculated into a score for each of the three subscales and a total score for positive mental health. The total score was included in the analyses. A recent study conducted by Trompetter et al. (2017) found adequate internal consistency for the overall MHC-SF ( $\alpha = .90$ ). For the present study, the internal consistency coefficient was .94.

### *Self-Compassion Scale*

Self-compassion was assessed using the Self-Compassion Scale (SCS; Neff, 2003), which includes 26-items assessing self-compassion rated on a 5-point Likert scale ranging from 1 (Almost never) to 5 (Almost always), based on how often the participant typically acts toward themselves as described by each item. The measure contains 6 scales, each with items related to a specific aspect of self-compassion. Three scales are considered positive components of self-compassion, including Self-Kindness (e.g., I'm kind to myself when I'm experiencing suffering), Common Humanity (e.g., When things

are going badly for me, I see the difficulties as part of life that everyone goes through), and Mindfulness (e.g., When something upsets me I try to keep my emotions in balance). The remaining three scales evaluate negative components related to self-criticism, including Self-Judgment (e.g., I'm disapproving and judgmental about my own flaws and inadequacies), Isolation (e.g., When I fail at something that's important to me, I tend to feel alone in my failure), and Over-Identification (e.g., When something upsets me I get carried away with my feelings). The items for the negative scales of Self-Judgment, Isolation, and Over-Identification are reverse scored prior to being added to the total score. Responses are calculated into a score for each of the 6 scales and a total score for self-compassion. All scores were included in the analyses. A recent study involving college students conducted by Pepping et al. (2015) found adequate internal consistency for the SCS ( $\alpha = .93$ ). For the current study, the internal consistency coefficient was .93.

#### *Posttraumatic Stress Disorder Checklist*

Posttraumatic stress symptoms were evaluated utilizing the Posttraumatic Stress Disorder Checklist (PCL-5; Weathers et al., 2013), which includes 20-items that assess Posttraumatic Stress Disorder-related symptoms corresponding to the DSM-5 specified criteria for PTSD. Each item asks about the participant to indicate the degree they have been bothered by a specific symptom over the past month using a 5-point Likert scale ranging from 0 (Not at all) to 4 (Extremely). Responses are calculated into a total severity score and four subscale severity scores, including intrusion, avoidance, cognition and mood alternations, and arousal and reactivity. The total score was included in the analyses for the present study. Recent PCL-5 norms for college student participants were derived from a study conducted by Blevins, Weathers, Davis, Witte, and Domino in

2015, which found adequate internal consistency ( $\alpha = .94$ ), test-retest reliability over the course of one week ( $r = .82$ ), discriminant validity ( $r$ 's ranging from .31 to .60), and convergent validity ( $r$ 's ranging from .74 to .85). In a recent study, internal consistency coefficient for the measure was found to be .95 (Teller, 2018). For the present study, the internal consistency coefficient was .96.

#### *Depression Anxiety Stress Scales-21*

Emotional distress was assessed utilizing the Depression Anxiety Stress Scale-21 (DASS-21; Lovibond & Lovibond, 1995), which measures levels of depression, anxiety, and stress. Participants rate items on a 4-point Likert scale ranging from 0 (Did not apply to me at all) to 3 (Applied to me very much, or most of the time) indicating the severity of symptoms experienced in the previous week. Responses are calculated into three subscale scores for depression, stress, and anxiety, with higher scores indicating increased severity of symptoms. Items include “I felt that life was meaningless” for depression, “I felt I was close to panic” for anxiety, and “I found myself getting agitated” for stress. Several studies of the psychometric properties of the DASS-21 have found that combining the three subscales creates one total score that accurately represents overall emotional distress (Osman, Wong, Bagge, Freedenthal, Gutierrez, & Lozano, 2012). Both the total score and three subscale scores were included in the analyses in the current study. Concurrent validity has been examined through comparisons to related scores from instruments including the Beck Anxiety Inventory (BAI; Beck & Steer, 1990), Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996), and the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983), with reliability coefficients of .69, .80, and .73, respectively (Osman et al., 2012). In a recent study involving emerging adult

participants, internal consistency coefficients for the measure ranged from .92 to .93 (Teller, 2018). For the present study, the internal consistency coefficient for the total score was .95 and the consistency coefficients for the subscales of depression, anxiety, and stress were .88, .88, and .87, respectively.

#### *Life Events Checklist*

The Life Events Checklist (LEC), initially created as a part of the Clinician Administered PTSD Scale (CAPS; Blake et al., 1995), is comprised on 17-items inquiring about previous exposure to potentially traumatic events during the participant's life. Some of the potentially traumatic experiences included are natural disasters, transportation accidents, physical and sexual assault, and combat exposure. For each of the 17 potentially traumatic life events the participant indicates their type of exposure to the experience from the following choices: "It happened to me", "I witnessed it", "I learned about it", "I'm not sure", and "Doesn't apply to me." The information collected from the LEC was used for descriptive statistics.

## CHAPTER III - RESULTS

The Cronbach's alphas calculated to examine the internal consistency of each measure and bivariate correlations conducted to assess the relationships between each variable of interest are presented along with the means and standard deviations for all measures in Table 1. Parent-child attachment quality, self-compassion, and positive mental health were all significantly positively correlated. These findings confirm the first, third, and fourth hypotheses of the current study regarding significant positive associations between attachment quality and self-compassion, attachment quality and positive mental health, and self-compassion and positive mental health. Additional bivariate correlations were conducted between parent-child attachment quality and each of the six facets of self-compassion. Two of the three facets considered to be representative of the positive components of self-compassion were found to be significantly positively correlated with attachment quality, including self-kindness ( $r = .12, p = .006$ ) and mindfulness ( $r = .13, p = .003$ ). All three self-compassion facets that evaluate the negative components related to self-criticism were found to be significantly negatively correlated with attachment quality, including self-judgment ( $r = -.40, p < .001$ ), isolation ( $r = -.39, p < .001$ ), and over-identification ( $r = -.38, p < .001$ ). Positive mental health was found to be significantly positively associated with self-kindness ( $r = .37, p < .001$ ), common humanity ( $r = .29, p < .001$ ), and mindfulness ( $r = .33, p < .001$ ), along with being significantly negatively correlated with self-judgment ( $r = -.15, p = .001$ ), isolation ( $r = -.16, p < .001$ ), and over-identification ( $r = -.14, p = .001$ ). Both Parent-child attachment quality and self-compassion were significantly negatively correlated with emotional distress, posttraumatic stress symptoms, and hurricane

exposure severity. Positive mental health was significantly negatively correlated with posttraumatic stress symptoms but was not associated with emotional distress or hurricane exposure severity.

Table 1 *Means, Standard Deviations, Alpha Coefficients, and Bivariate Correlations for Study Measures*

Measure	M (SD)	$\alpha$	1	2	3	4	5	6
1. IPPA	83.98 (14.86)	.89	-	.50**	.49**	-.38**	-.45**	-.28**
2. SCS Total	18.33 (2.50)	.93	-	-	.46**	-.41**	-.38**	-.14**
3. MHC-SF	41.50 (13.75)	.94	-	-	-	-.03	-.15**	-.06
4. DASS-21 Total	28.86 (14.59)	.95	-	-	-	-	.72**	.48**
5. PCL-5	41.10 (18.64)	.96	-	-	-	-	-	.56**
6. HURTE	13.01 (5.84)	.88	-	-	-	-	-	-

*Note.* IPPA = Inventory of Parent and Peer Attachment; SCS = Self-Compassion Scale; MHC-SF = Mental Health Continuum-Short Form; DASS-21 = Depression Anxiety Stress Scales- 21-item version; PCL-5 = Posttraumatic Stress Disorder Checklist; HURTE = Hurricane-Related Traumatic Experiences; \* $p < .05$ , \*\* $p < .01$

### Mediation Analyses

Structural equation modeling was used to examine the relationships between parent-child attachment quality, self-compassion, positive mental health, posttraumatic distress, and emotional distress. Each model was built and analyzed using SPSS AMOS software with maximum likelihood estimation. Model fit was determined through examination of the chi-square, Root Mean Square Error of Approximation (RMSEA),

Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI). The significance of each mediation was determined using 10,000 bootstrapped cases which provided confidence intervals for total, direct, and indirect effects for each model. In order for significance to be achieved, the confidence intervals for total, direct, and indirect effects could include zero between the lower-limit confidence intervals (LLCI) and upper-limit confidence intervals (ULCI).

The first mediation model examined the mediating role of self-compassion in the relationship between parent-child attachment quality and both posttraumatic stress symptoms and emotional distress (Figure 1). The model fit yielded a significant chi-square ( $\chi^2(1, 453) = 31.795, p < .001$ ). The RMSEA provided an estimate of 0.09, with 90 percent confidence the RMSEA value falls between 0.066 to 0.132. The model had a sufficient CFI (.986) and an adequate TLI (.966). The small chi-square value, RMSEA value, CFI and TLI scores signify that this model is an adequate fit. In this model, the total effect of parent-child attachment quality was found to be significant for both posttraumatic stress symptoms ( $\beta = -.45, SE = .05, p < .001, 95\% CI [-.54, -.36]$ ) and emotional distress ( $\beta = -.38, SE = .05, p < .001, 95\% CI [-.47, -.29]$ ). Parent-child attachment quality was found to significantly predict self-compassion ( $\beta = .50, SE = .06, p < .001, 95\% CI [.38, .60]$ ) and self-compassion significantly predicted both posttraumatic stress symptoms ( $\beta = -.20, SE = .05, p < .001, 95\% CI [-.31, -.09]$ ) and emotional distress ( $\beta = -.29, SE = .05, p < .001, 95\% CI [-.38, -.20]$ ). Furthermore, significant direct effects were found between parent-child attachment quality and both posttraumatic stress symptoms ( $\beta = -.35, SE = .05, p < .001, 95\% CI [-.45, -.24]$ ) and emotional distress ( $\beta = -.24, SE = .05, p < .001, 95\% CI [-.34, -.13]$ ). The indirect effect

from parent-child attachment quality through self-compassion to posttraumatic stress symptoms was also found to be significant ( $\beta = -.10$ ,  $SE = .03$ ,  $p < .001$ , 95% CI [-.17, -.04]). Additionally, the indirect effect from parent-child attachment quality through self-compassion to emotional distress was also found to be significant ( $\beta = -.14$ ,  $SE = .03$ ,  $p < .001$ , 95% CI [-.22, -.09]). The relationships between parent-child attachment quality and both posttraumatic stress symptoms and emotional distress were significantly reduced with the inclusion of self-compassion as a mediator; therefore, the assumptions of partial mediation were met, confirming hypothesis two.

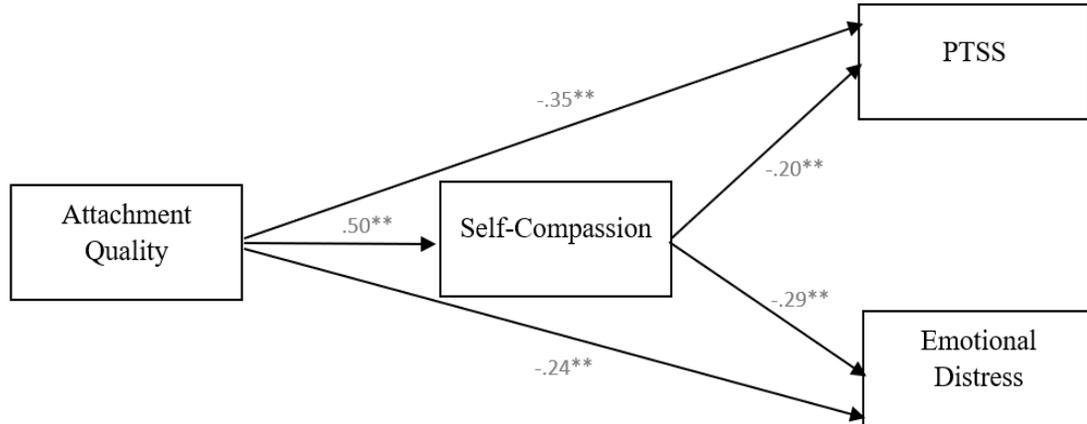


Figure 1. *Mediation Model Analyses with Self-Compassion*

Note: Standardized regression coefficients reported. Attachment Quality= Inventory of Parent and Peer Attachment Total Score; Self-Compassion = Self-Compassion Scale Total Score; PTSS = Posttraumatic Stress Symptoms; PTSD Checklist for DSM-5 Total Score; Emotional Distress = Depression Anxiety Stress Scales- 21-item Total Score; \* $p < .05$ , \*\*  $p < .01$

The second mediation model examined self-compassion as a possible mediator in the relationship between parent-child attachment quality and positive mental health (Figure 2). The total effect of parent-child attachment quality on positive mental health

was found to be significant ( $\beta = .49, SE = .05, p < .001, 95\% CI [.39, .58]$ ). As found in the first mediation model, parent-child attachment quality significantly predicted self-compassion ( $\beta = .50, SE = .06, p < .001, 95\% CI [.38, .60]$ ). Self-compassion was also found to significantly predict positive mental health ( $\beta = .29, SE = .04, p < .001, 95\% CI [.20, .38]$ ). The direct effect between parent-child attachment quality and positive mental health remained significant ( $\beta = .35, SE = .05, p < .001, 95\% CI [.24, .45]$ ). The indirect effect from parent-child attachment quality through self-compassion to positive mental health was also found to be significant ( $\beta = .14, SE = .03, p < .001, 95\% CI [.09, .21]$ ). The relationship between parent-child attachment quality and positive mental health was significantly reduced with the inclusion of self-compassion as a mediator and the indirect effect through the self-compassion as a mediator fulfill the assumptions of partial mediation, thus confirming hypothesis five.

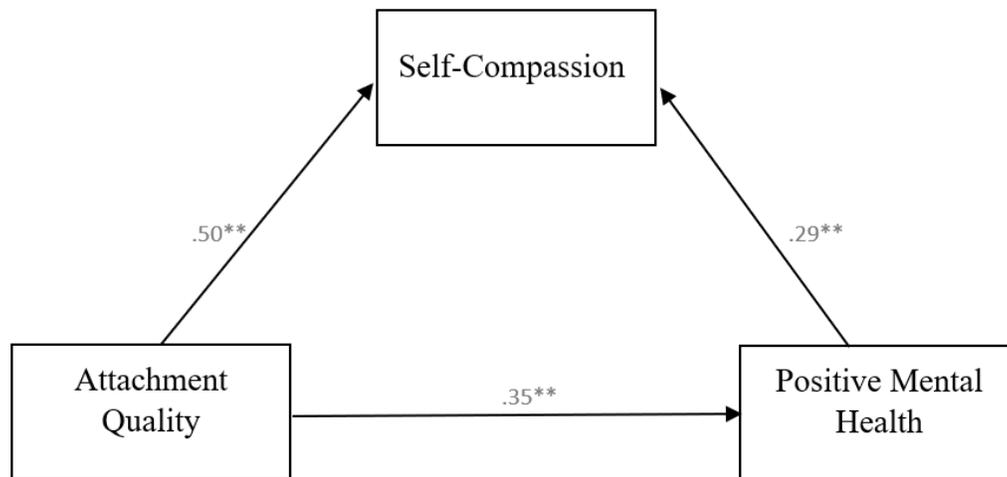


Figure 2. *Mediation Model Analysis with Positive Mental Health Outcome*

Note: Standardized regression coefficients reported. Attachment Quality= Inventory of Parent and Peer Attachment Total Score; Self-Compassion = Self-Compassion Scale Total Score; Positive Mental Health = Mental Health Continuum-Short Form Total Score; \* $p < .05$ , \*\*  $p < .01$

The third mediation model examined the potential serial mediation of self-compassion and positive mental health in the relationships between parent-child attachment quality and both posttraumatic stress symptoms and emotional distress (Figure 3). The model fit yielded a significant chi-square ( $\chi^2 (1, 453) = 41.094, p < .001$ ). The RMSEA provided an estimate of .096, with 90 percent confidence the RMSEA value falls between 0.068 to 0.126. The model had a sufficient CFI (.984) and an adequate TLI (.958). The chi-square value, RMSEA value, CFI and TLI scores signify that this model is an adequate fit. Parent-child attachment quality was found to significantly predict self-compassion ( $\beta = .50, SE = .06, p < .001, 95\% CI [.38, .60]$ ). Self-compassion significantly predicted positive mental health ( $\beta = .29, SE = .05, p < .001, 95\% CI [.20, .38]$ ). Positive mental health significantly predicted posttraumatic stress symptoms ( $\beta = .17, SE = .06, p = .005, 95\% CI [.05, .29]$ ) and emotional distress ( $\beta = .32, SE = .06, p < .001, 95\% CI [.20, .43]$ ). The indirect effect from parent-child attachment quality through self-compassion through positive mental health to posttraumatic stress symptoms was found to be significant ( $\beta = .03, SE = .01, p = .002, 95\% CI [.009, .05]$ ). The indirect effect from parent-child attachment quality through self-compassion through positive mental health to emotional distress was found to be significant ( $\beta = .05, SE = .01, p < .001, 95\% CI [.03, .07]$ ). It was hypothesized that better parent-child attachment quality would be positively associated with self-compassion, which in turn would be positively associated with positive mental health, which then would be negatively associated with both emotional distress and posttraumatic stress symptoms. However, given the

unexpected positive relationship between positive mental health and both posttraumatic stress symptoms and emotional distress, hypothesis six was not supported.

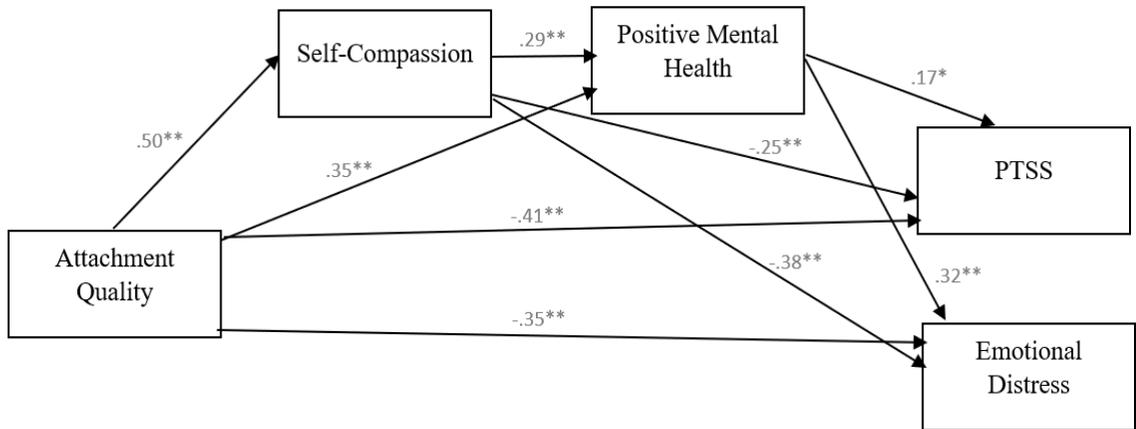


Figure 3. *Serial Mediation Model Analyses*

Note: Standardized regression coefficients reported. Attachment Quality= Inventory of Parent and Peer Attachment Total Score; Self-Compassion = Self-Compassion Scale Total Score; Positive Mental Health = Mental Health Continuum-Short Form Total Score; PTSS = Posttraumatic Stress Symptoms; PTSD Checklist for DSM-5 Total Score; Emotional Distress = Depression Anxiety Stress Scales- 21-item Total Score; \* $p < .05$ , \*\*  $p < .01$

### Moderating Role of Hurricane Exposure Severity

To further examine the relationship between parent-child attachment quality and self-compassion, hurricane exposure severity as measured by the HURTE total score was included in analyses as a possible moderator. To investigate the hypothesis an interaction variable was created between parent-child attachment quality and hurricane exposure severity. The interaction term was found to be significant indicating hurricane exposure severity moderated the relationship between attachment quality and self-compassion ( $\beta = -.28$ ,  $SE = .06$ ,  $p < .001$ , 95% CI [-.38, -.16]). The moderation effect was examined

further with simple slopes analyses (Aiken & West, 1991; Preacher, Rucker, & Hayes, 2007). Specifically, the conditional effects of attachment quality on self-compassion were analyzed at three levels of hurricane exposure severity, one standard deviation above the mean, the mean, and one standard deviation below the mean (Figure 4). While the moderation effect was found to be significant for participants with average levels of hurricane exposure severity ( $\beta = .38$ ,  $SE = .05$ ,  $p < .001$ , 95% CI [.29, .46]) to lower levels of hurricane exposure severity (1 SD below the mean;  $\beta = .61$ ,  $SE = .04$ ,  $p < .001$ , 95% CI [.53, .70]), the effect was not significant for those with higher levels of hurricane exposure severity (1 SD above the mean;  $\beta = .14$ ,  $SE = .07$ ,  $p > .05$ , 95% CI [-.004, .28]). Therefore, as hurricane exposure severity was found to moderate the relationship between parent-child attachment quality and self-compassion with stronger relationships being found for lower levels of hurricane exposure severity, hypothesis seven was supported.

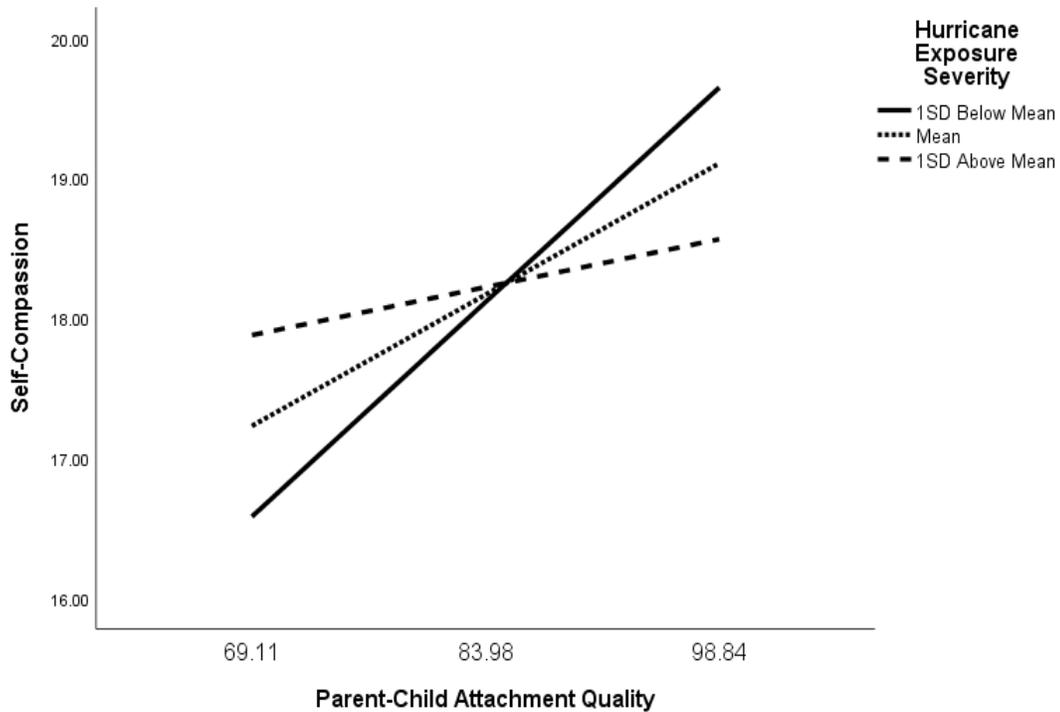


Figure 4. *Simple Slopes of Hurricane Exposure Severity Moderation of Relationship Between Parent-Child Attachment Quality and Self-Compassion.*

The first moderated mediation model examined the moderating role of hurricane exposure severity in the mediation model including parent-child attachment quality, self-compassion as the mediator, and the outcome variables of posttraumatic stress symptoms and emotional distress (Figure 5). As developed and recommended by Hayes (2015), the index of moderated mediation, which quantifies the effect of the moderator on the mediation indirect effect, was calculated and examined for significance. The index of moderated mediation was significant for both posttraumatic stress symptoms ( $\beta = .05$ ,  $SE = .02$ , 95% CI [.02, .09]) and emotional distress ( $\beta = .07$ ,  $SE = .02$ , 95% CI [.03, .11]), indicating that moderated mediations occurred. Hurricane exposure severity was found to significantly moderate the indirect effect from attachment quality through self-compassion to posttraumatic stress symptoms ( $\beta = -.08$ ,  $SE = .02$ , 95% CI [-.13, -.03])

and emotional distress ( $\beta = -.11$ ,  $SE = .03$ , 95% CI [-.16, -.06]) for participants with average hurricane exposure severity. Furthermore, for participants with lower hurricane exposure severity (1 SD below the mean), hurricane exposure severity was found to significantly moderate the indirect effect from attachment quality through self-compassion to posttraumatic stress symptoms ( $\beta = -.12$ ,  $SE = .04$ , 95% CI [-.20, -.06]) and to emotional distress ( $\beta = -.18$ ,  $SE = .04$ , 95% CI [-.26, -.11]). However, the effect was not significant for those with higher hurricane exposure severity (1 SD above the mean) for either posttraumatic stress disorder ( $\beta = -.03$ ,  $SE = .02$ , 95% CI [-.07, .001]) or emotional distress ( $\beta = -.04$ ,  $SE = .02$ , 95% CI [-.09, .005]). As predicted, the relationship between attachment quality and self-compassion, along with the conditional indirect effects were found to be moderated by hurricane exposure severity, with stronger relationships at lower levels of exposure severity.

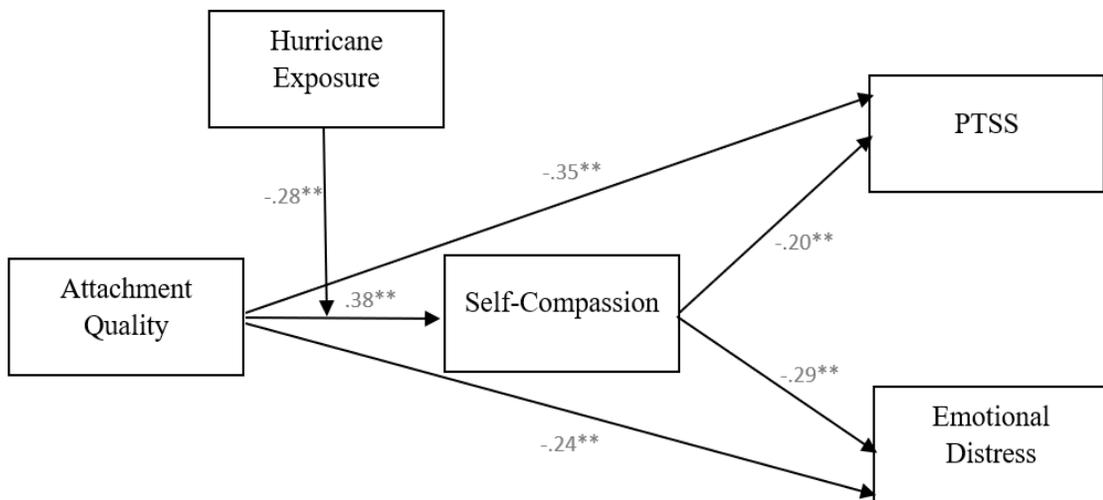


Figure 5. *Moderated Mediation Model Analyses*

Note: Standardized regression coefficients reported. Attachment Quality= Inventory of Parent and Peer Attachment Total Score; Self-Compensation = Self-Compensation Scale Total Score; PTSS = Posttraumatic

Stress Symptoms; PTSD Checklist for DSM-5 Total Score; Emotional Distress = Depression Anxiety Stress Scales- 21-item Total Score; Hurricane Exposure Severity = HURTE Total Score; \* $p < .05$ , \*\*  $p < .01$

The second moderated mediation model hypothesized that hurricane exposure severity would moderate the mediation relationship between parent-child attachment quality, self-compassion, and positive mental health. The index of moderated mediation was significant ( $\beta = -.07$ ,  $SE = .02$ , 95% CI [-.11, -.04]), indicating that moderated mediation occurred. Hurricane exposure was found to significantly moderate the indirect effect from attachment quality through self-compassion to positive mental health for participants with average hurricane exposure severity ( $\beta = .11$ ,  $SE = .02$ , 95% CI [.07, .16]) to lower hurricane exposure severity (1 SD below the mean;  $\beta = .18$ ,  $SE = .03$ , 95% CI [.11, .25]). However, the effect was not significant for those with higher hurricane exposure severity (1 SD above the mean;  $\beta = .04$ ,  $SE = .02$ , 95% CI [-.004, .09]). The moderated partial mediation results for this model parallel the previous model, with stronger effects occurring at lower levels of the moderator hurricane exposure severity.

The final moderated mediation model examined the moderating role of hurricane exposure severity in the serial mediation including parent-child attachment quality, self-compassion, positive mental health, posttraumatic stress symptoms, and emotional distress (Figure 6). The index of moderated mediation was significant for both the outcome variable of posttraumatic stress ( $\beta = -.002$ ,  $SE = .001$ , 95% CI [-.004, -.001]) and emotional distress ( $\beta = -.004$ ,  $SE = .001$ , 95% CI [-.007, -.002]), indicating that moderated mediations occurred. For participants with average hurricane exposure severity, hurricane exposure was found to significantly moderate the indirect effect from attachment quality through self-compassion through positive mental health to

posttraumatic stress symptoms ( $\beta = .02, SE = .008, 95\% CI [.008, .03]$ ) and to emotional distress ( $\beta = .04, SE = .01, 95\% CI [.02, .05]$ ). Furthermore, for participants with lower hurricane exposure severity (one SD below the mean), hurricane exposure was found to significantly moderate the indirect effect from attachment quality through self-compassion through positive mental health to posttraumatic stress symptoms ( $\beta = .03, SE = .01, 95\% CI [.01, .05]$ ) and emotional distress ( $\beta = .06, SE = .01, 95\% CI [.04, .09]$ ). However, the effect was not significant for those with higher hurricane exposure severity (1 SD above the mean) for either posttraumatic stress disorder ( $\beta = .007, SE = .005, 95\% CI [-.001, .02]$ ) or emotional distress ( $\beta = .01, SE = .008, 95\% CI [-.002, .03]$ ). As hypothesized and consistent with the previous moderated partial mediations, stronger relationships were found at lower levels of the moderator hurricane exposure severity.

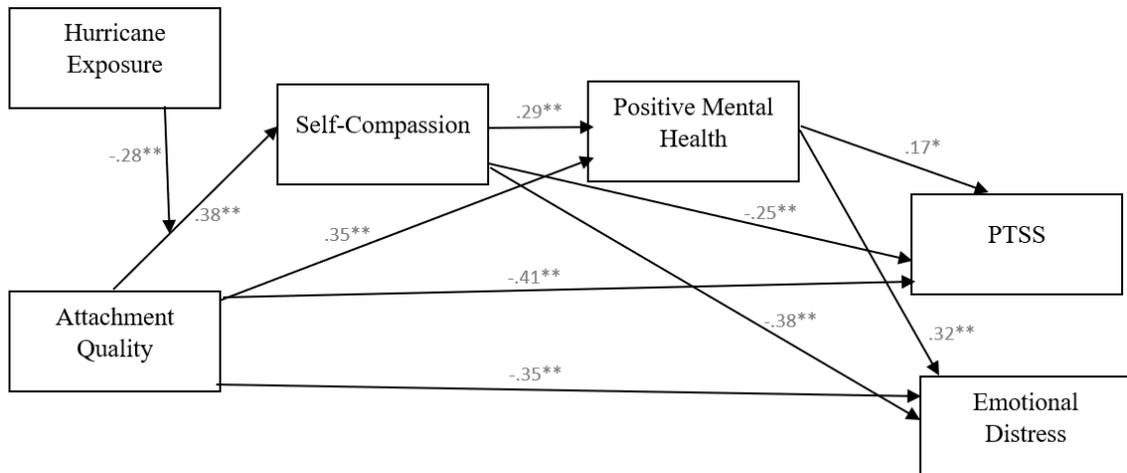


Figure 6. *Moderated Serial Mediation Model Analyses*

Note: Standardized regression coefficients reported. Attachment Quality= Inventory of Parent and Peer Attachment Total Score; Self-Compasion = Self-Compasion Scale Total Score; Positive Mental Health = Mental Health Continuum-Short Form Total Score; PTSS = Posttraumatic Stress Symptoms; PTSD Checklist for DSM-5 Total Score; Emotional Distress = Depression Anxiety Stress Scales- 21-item Total Score; Hurricane Exposure Severity = HURTE Total Score; \* $p < .05$ , \*\*  $p < .01$

## CHAPTER IV – DISCUSSION

The present study sought to investigate the mediating roles of self-compassion and positive mental health in the relationships between parent-child attachment quality and both posttraumatic stress symptoms and emotional distress in a sample of emerging adult hurricane survivors. Additionally, the degree to which hurricane exposure severity moderated these mediations was explored. Examination of the bivariate correlations between all variables found parent-child attachment quality, self-compassion, and positive mental health to all be significantly positively correlated. Both parent-child attachment quality and self-compassion had significant negative associations with posttraumatic stress symptoms, emotional distress, and hurricane exposure severity. While positive mental health was significantly negatively correlated with posttraumatic stress symptoms, it was not found to be associated with emotional distress or hurricane exposure severity. The association between positive mental health and posttraumatic stress symptoms, along with the not significant correlation found between positive mental health and emotional distress provides further evidence that positive mental health and psychopathology function on two distinct yet related continua, with one continuum indicating the presence or absence of mental health and a second continuum indicating the presence or absence of psychopathology (Keyes, 2005).

As hypothesized, within the first partial mediation model (Figure 1) parent-child attachment quality positively predicted self-compassion, which in turn negatively predicted both posttraumatic stress symptoms and emotional distress. The association found between parent-child attachment quality and posttraumatic stress symptoms and

emotional distress is consistent with previous literature (Teller, 2018), while the relationship found between attachment quality and self-compassion is a notable contribution to the growing body of literature examining the influence of attachment on self-compassion. Stemming from Bowlby's (1969) theory that attachment style influences the development of coping strategies, Seiffge-Krenke and Beyers (2005) theorized that aspects of attachment continue to shape coping behaviors into adulthood. The results suggest that higher parent-child attachment quality, as indicated by increased trust and communication along with decreased alienation between parent and their emerging adult child, may promote the emerging adult's use of self-compassion. This positive relationship between attachment quality and self-compassion appears to be a mechanism that partially explains the relationships between attachment quality and both posttraumatic stress symptoms and emotional distress.

As predicted, within the second partial mediation model (Figure 2) parent-child attachment quality positively predicted self-compassion, while self-compassion also positively predicted positive mental health. Thus, self-compassion is one mechanism by which attachment is associated with positive mental health. These results are consistent with and build upon previous research. Attachment security and maternal support have been found to be associated with various aspects of positive mental health in several studies (Barber & Harmon, 2002; Cooper, Shaver, & Collins, 1998; Crittenden, Claussen, & Sugarman, 1994; Steinberg, 1990). Additionally, higher levels of self-compassion have been found for adolescents with secure attachment to their parents (Neff & McGee, 2010). Self-compassion has been found to contribute to the development of resources thought to promote positive mental health, including self-acceptance, positive social

interactions, environmental mastery, and positive emotions (Keyes, 2005; Neff et al., 2007; Trompetter, Kleine, & Bohlmeijer, 2017). The results of the present study provide support for the theory that supportive relationships with parents may impact positive mental health by fostering self-compassion (Neff & McGee, 2010).

The hypothesis that self-compassion and positive mental health would serially mediate the relationships between parent-child attachment quality and posttraumatic stress symptoms and emotional distress was partially supported. As predicted, the serial partial mediation model (Figure 3) was significant with parent-child attachment quality positively predicting self-compassion, which in turn positively predicted positive mental health. However, while positive mental health was hypothesized to be negatively predictive of posttraumatic stress symptoms and emotional distress, it was instead found to positively predict both outcomes. Positive mental health is considered to be a combination of emotional well-being, psychological well-being, and social well-being (Keyes, 2002; Lamers, Westerhof, Kovacs, & Bohlmeijer, 2012). In a study conducted by Keyes (2005), some participants were found to report psychopathology and a moderate level of positive mental health, while individuals with low positive mental health did not always report experiencing psychopathology. Keyes (2005) findings along with the results of the present study support the two continua model of positive mental health, indicating positive mental health and psychopathology do not exist as exact opposites and individuals with psychopathology may possess varying levels of positive mental health (Keyes et al., 2008; Lamers et al., 2012). While the present study's findings do not provide evidence of positive mental health as a protective factor against the development of posttraumatic stress symptoms or emotional distress, Keyes (2007) found the level of

positive mental health to be predictive of the psychosocial functioning level of adults with psychopathology, such that individuals with high positive mental health who experience psychopathology symptoms were found to have better psychosocial functioning in comparison to those with lower positive mental health. Thus, positive mental health may function as a source of resilience for individuals experiencing various psychopathology and the psychosocial functioning and outcomes for these individuals need further investigation.

The present study explored the potential moderating influence of hurricane exposure severity, which was conceptualized as the amount of hurricane-related life threat and both immediate and ongoing loss and disruption assessed by the HURTE. As hypothesized, hurricane exposure severity moderated the relationship between parent-child attachment quality and self-compassion, with a stronger relationship being found for lower levels of hurricane exposure severity. Consistent with predictions, both moderated mediations (Figure 5) and the moderated serial mediation (Figure 6) had parallel significant findings of indirect effects being stronger at lower levels of hurricane exposure severity. These findings are consistent with the Conservation of Resources Theory (Hobfoll, 1989) and with previous findings that increased loss of resources and severity of exposure to a natural disaster are predictive of psychological distress (Chan & Rhodes, 2014; Sattler et al., 2002). The characteristics and severity of the natural disaster experience have been found to increase the risk for developing PTSD and other psychopathology (Chan & Rhodes, 2014; Galea et al., 2005; Tracy et al., 2011; Weems et al., 2007). Jacobs and Harville (2015) found experiencing physical injury, witnessing the injury or death of another person, perceiving a threat to life, and property damage and

loss to be associated with more severe and persistent mental health problems following a natural disaster. Several studies have found the loss of resources caused by a natural disaster to be predictive of psychological distress (Brown et al., 2013; Hanama-Raz, Palgi, Leshem, Ben-Ezra, & Lavenda, 2017; Sattler et al., 2002). The Conservation of Resources Theory posits that as the amount of resources lost by an individual as a result of trauma increases, the ability for the individual to successfully adjust decreases (Hamama-Raz, Palgi, Shrira, Goodwin, Kaniasty, & Ben-Ezra, 2015; Hobfoll, 1989). This decrease in adjustment ability in response to trauma is likely related to the individual needing to use other resources in an effort to reacquire the resources they lost (Hamama-Raz et al., 2015). More severe hurricane exposure and resource loss may disrupt the relationship between parent and child and thus decrease attachment quality (Jones, Cassidy, & Shaver, 2015; Sherman et al., 2016). Furthermore, the loss and threat to resources resulting from hurricane exposure may significantly hinder an individual's ability to utilize effective coping strategies, such as self-compassion. The results of the present study in conjunction with the established literature addressing hurricane exposure, indicate that hurricane exposure severity should be assessed and considered when researching the effects of hurricanes and other natural disasters.

#### Limitations

While the results of the present study build upon previous research, there were several limitations to the study that should be considered when interpreting the findings. First, causal conclusions could not be drawn from the mediation analyses due to the study's cross-sectional design. A longitudinal study including experimental controls would be necessary for drawing causal and temporal connections between the variables.

While the current study's international sample of emerging adult survivors of one or more of seven hurricanes is considered a strength, the use of MTurk crowd-sourced data presents some limitations. Emerging adult hurricane survivor MTurk users may differ from other emerging adult survivors, thus limiting the generalizability of the results. The demographics of the sample may also limit generalizability of the findings. Also, screening for a specific population, including the hurricane survivor population, through MTurk can be challenging in that it is difficult to confirm each participant meets the participation requirements. Therefore, it is strongly recommended that additional studies utilizing alternative recruitment methods be conducted in an effort to replicate the findings of the present study.

Considering the occurrence of the hurricanes investigated in the present study spanned from August 2017 to October 2019, the retrospective nature of the measure of hurricane exposure severity should be taken into account when reviewing the results. Furthermore, while in the present study the participants were instructed to complete the PCL-5 in the context of their hurricane-related trauma, it was not possible to certify these instructions were followed and the endorsed symptoms were not instead related to a non-hurricane trauma or general distress. Taking into consideration the amount of potentially traumatic experiences endorsed by the participants through the LEC and without a thorough assessment of any mental health symptoms experienced prior to the hurricane exposure, it is not possible to ascertain the extent the reported posttraumatic stress symptoms and emotional distress were attributable to hurricane exposure. Further investigation of the relationships involving posttraumatic stress symptoms and emotional distress found in the present study involving a more thorough assessment of both

symptoms currently experienced and experienced prior to hurricane exposure is recommended.

#### Areas for Future Research

Parent-child attachment quality was found to be associated with self-compassion, positive mental health, posttraumatic stress symptoms, and emotional distress, thus indicating that future research should continue to explore attachment quality within the context of trauma. Considering parent-child attachment quality has been found to be influential on emerging adult coping behaviors and mental health outcomes in several studies (Armsden & Greenberg, 1987; Dykas & Cassidy, 2011; Hovee et al., 2012; Teller, 2018), further investigation of attachment quality beyond childhood is needed. Exploring the potential mechanisms in the relationships between parent-child attachment quality, self-compassion, and positive mental health could inform future treatment interventions for both emerging adults and parents exposed to hurricane-related trauma. Additionally, exploration of these relationships for individuals with no hurricane exposure may be beneficial for comparison purposes and because increased understanding of the mechanisms which enhance attachment quality, self-compassion, and positive mental health would be advantageous for all emerging adults.

Considering the impact of hurricane exposure severity found in this study and previous research, development of a more comprehensive and thorough exposure measure would be beneficial. While the HURTE used in the current study is helpful for gaining general insight into the loss and disruption resulting from a hurricane, a measure including rating scales for describing the amount of each loss and disruption along with

inquiries about the duration of loss and disruption would improve understanding of exposure impact and strengthen related statistical analyses.

Additional research is needed to improve understanding of the interactions between positive mental health and psychopathology in the context of trauma exposure. While the present study did not find support for the expectation that positive mental health served as a protective factor against the development of posttraumatic stress symptoms or emotional distress, the level of positive mental health has been found to be predictive of the psychosocial functioning of adults with psychopathology in previous research (Keyes, 2007). Based on the evidence found in the current study for the two-continua theory of positive mental health, further investigation into how the outcomes for emerging adult hurricane survivors possessing both high levels of positive mental health and psychopathology may differ from the outcomes of those with little to no positive mental health would provide much needed insight into the function of this potential resilience resource.

### Conclusions

Parent-child attachment quality was found to be predictive of self-compassion and positive mental health in a sample of emerging adult hurricane survivors. As predicted, self-compassion partially mediated the relationships between parent-child attachment quality and positive mental health, posttraumatic stress symptoms, and emotional distress. The relationships between attachment quality and posttraumatic stress symptoms and emotional distress were also partially mediated by the serial mediators of self-compassion and positive mental health. Additionally, these mediations were all found to be moderated by hurricane exposure severity.

## APPENDIX A - IRB Approval Letter

**Office of  
Research Integrity**



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### **NOTICE OF INSTITUTIONAL REVIEW BOARD ACTION**

The project below has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy to ensure:

- The risks to subjects are minimized and reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered involving risks to subjects must be reported immediately. Problems should be reported to ORI via the Incident template on Cayuse IRB.
- The period of approval is twelve months. An application for renewal must be submitted for projects exceeding twelve months.

PROTOCOL NUMBER: IRB-18-100

PROJECT TITLE: Dissertation

SCHOOL/PROGRAM: School of Psychology, Psychology

RESEARCHER(S): Alexandra Teller, Bonnie Nicholson

IRB COMMITTEE ACTION: Approved

CATEGORY: Expedited

7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality

assurance methodologies.

PERIOD OF APPROVAL: March 18, 2019 to March 18, 2020

A handwritten signature in black ink that reads "Donald Sacco". The signature is written in a cursive style with a prominent flourish at the end.

**Donald Sacco, Ph.D.**  
**Institutional Review Board Chairperson**

APPENDIX B - IRB Notice of Renewal

**Office of  
Research Integrity**



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**NOTICE OF RENEWAL**

The University of Southern Mississippi's Office of Research Integrity has received the notice of renewal for your submission:

PROTOCOL NUMBER: IRB-18-100

PROJECT TITLE: Dissertation

SCHOOL/PROGRAM: School of Psychology, Psychology

RESEARCHER(S): Alexandra Teller, Bonnie Nicholson

IRB COMMITTEE ACTION: Approved

In accordance with Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy your prior reviewed submission has been renewed. From this time of this renewal your study is approved for twelve months.

PERIOD OF APPROVAL: February 19, 2020 - February 18, 2021

**Sincerely,  
Office of Research Integrity**

## APPENDIX C –Electronic Informed Consent

**PURPOSE:** The present study seeks to better understand the relationship between parenting and mental health outcomes in emerging adulthood.

**DESCRIPTION OF STUDY:** The present study will consist of completing several brief questionnaires through a secure web portal via the internet. Completion of the study should take approximately 30 minutes, and participants will receive 25 cents, which will only be given to participants who have completed the survey in its entirety and have answered honestly.

**BENEFITS:** There are no direct benefits expected for participants within the current study. However, the researchers intend for this study to expand the knowledge related to parental behavior and mental health outcomes in emerging adulthood hurricane survivors who lived in an area impacted by a category 4 or category 5 hurricane in the past 3 years (i.e., Hurricane, Dorian, Hurricane Lorenzo, Hurricane Florence, Hurricane Michael, Hurricane Harvey, Hurricane Irma, Hurricane Maria) at the time of the disaster.

**RISKS:** There are no foreseeable risks associated with the current study, beyond those already present in routine daily life. If any questionnaire material evokes distress during the completion of this study, participants may withdraw from the study at any time without penalty, prejudice, or loss of benefits and should contact the researcher with concerns immediately.

**CONFIDENTIALITY:** The records of this study will be kept private. You will not be asked to provide your name. Your worker ID (i.e. the 14-character sequences of letters and numbers used to identify workers) will be protected and is only collected for the purposes of distributing compensation and will not be associated with survey responses. At the conclusion of data collection for this study, all identifying information will be deleted. The on-line survey has security measures to protect your responses and there are no hard copies of your responses. Findings will be presented in aggregate form with no identifying information to ensure confidentiality and will be stored on a password protected computer. In any sort of report that might be published from these data, no information will be included that will make it possible to identify you. However, should you wish to contact the requester, your email address will automatically be inserted in the message so the requester can reply to you. Amazon.com inserts the worker's name as well. Therefore, it is possible that if you contact the requester, that your name and email address will be included.

Future data use may require that researchers outside of those listed as current investigators have access to your data. In all cases, these researchers will complete ethics training as mandated by the University of Southern Mississippi Institutional Review Board policy. Additionally, data for future use will be de-identified and stored in a secure location to ensure that confidentiality is maintained. Data will be stored in a secure location for six (6) years, after which time it will be destroyed.

**ALTERNATIVE PROCEDURES:** Participation in this study is voluntary. You are free to not answer any question or withdraw at any time. However, if you do not complete the survey measures, you will not be compensated.

**PARTICIPANT’S ASSURANCE:** This project has been reviewed by the Institutional Review Board, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the Institutional Review Board, The University of Southern Mississippi, Box 5147, Hattiesburg, MS 39406, (601) 266-5997. Participation in this project is completely voluntary, and participants may withdraw from this study at any time without penalty, prejudice, or loss of benefits. Questions concerning the research should be directed to the primary researcher Alexandra Teller (Alexandra.teller@usm.edu) or the research supervisor, Dr. Bonnie Nicholson (Bonnie.nicholson@usm.edu).

If you experience distress as a result of your participation in this study, please notify the primary researcher Alexandra Teller (Alexandra.teller@usm.edu) or the research supervisor, Dr. Bonnie Nicholson (Bonnie.nicholson@usm.edu). A list of available agencies that may be able to provide services for you are provided below:

National Crisis Call Center: (800) 273-8255

National Crisis Text Line: Text HOME to 741741

**CONSENT TO PARTICIPATE IN RESEARCH:**

By selecting “Yes” below, consent is hereby given to participate in this study. I have read the informed consent agreement associated with this study, and hereby provide informed consent of my participation.

- Yes
- No

**Consent is hereby given to participate in this study.**

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