

THE IMPACT OF HURRICANE KATRINA ON ADOLESCENT PSYCHOLOGICAL
ADJUSTMENT AND ADAPTATION IN SOUTHEAST LOUISIANA

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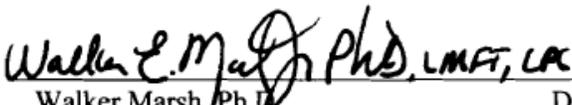
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Abstract

THE IMPACT OF HURRICANE KATRINA ON ADOLESCENT PSYCHOLOGICAL
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Hurricane Katrina ripped through Louisiana and the Gulf Coast in late August 2005. This devastating storm left thousands of people homeless and forever changed the lives of those who lived in these areas. Adolescents in the storm-impacted areas continue to be affected by life events brought about by this natural catastrophe. Many adolescents moved to another parish or state and started a new school, and many students reported attending multiple schools. Adolescents lost possessions and friends, and many continue to experience grief and loss issues related to Hurricane Katrina. Family job loss and associated financial hardship added to the already complex lives of adolescents who were navigating their way through high school and dealing with day-to-day teenager stress. This paper reviews the research on natural disasters and the impact of Hurricane Katrina

on adolescent psychological adjustment and adaptation. The results from this study indicate there is a statistically significant correlation between hurricane impact and mental health. The data shows that the students who experienced the most mental health issues such as Generalized Anxiety Disorders, post traumatic stress disorder, major depression, and eating disorder were in the evacuation group who returned to St. Tammany parish within 30 days after the hurricane. The data indicates that students relied primarily on parents and friends to help them adapt and adjust after the hurricane. This dissertation will help those who work with adolescents to better understand how they adapt and adjust after a major natural disaster.

Dedication

I could not have completed this dissertation without the love and support of my wife, Cindy. Cindy passed away from leukemia before she could witness me finish this process, but her encouragement kept me going when I became discouraged after comprehensive exams, Hurricane Katrina, and additional flooding of the home we built together, as well as her ten month battle with acute lymphoblastic leukemia. She encouraged me up until the end of her life when she went home to be with Lord and she continues to be an inspiration to me today. This dissertation is dedicated to you Cindy with much love and appreciation for the wonderful 29 years I had the privilege of being your husband. The following scripture is on Cindy's headstone and it is fitting for a person who loved and served the Lord all of her life: "Her children arise and call her blessed; her husband also and he praises her" (Proverbs 31: 29. NKJV).

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I want to thank my committee: Dr. Ed Barker, Dr. Gina Barker, and Dr. Walker Marsh as well as Dr. Don Johnson from the University of Southern Mississippi for their unwavering help and support. I also want to thank my mother and father who always encouraged me to do my best and to aim high. I want to thank Dr. Richard Kelly, my brother, who kept up his encouragement throughout this process telling me if he could get a Ph.D., I could also. Thanks also to Debbie Kelly for her ongoing encouragement and support during the last few months. Last, but certainly not least, I thank God who for reasons known only to Him counseled me to go back to school and finish this Ph.D. to better serve Him.

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CHAPTER ONE: INTRODUCTION

Trauma resulting from natural disasters such as hurricanes can cause emotional or behavioral disturbances in children and adolescents. Armsworth and Holaday (1993) argued that although awareness of how trauma impacts children and adolescents has increased over the last several decades, researchers still have much to learn in order to make the assessment and treatment of these children more precise. Pfefferbaum, Houston, North and Regens (2008) stated that almost one-half of youth directly exposed to severe natural events can develop diagnosable symptoms that may endure for years. Flory, Kloos, Hankin, and Cheely (2008) discussed how clinical research is an underutilized combination of skills that psychologists and mental health providers can offer in response to disasters. They stated that this knowledge can make significant contributions to how communities respond to future disasters. Osofsky, Osofsky, Kronenberg, Brennan, and Hansel (2009) discussed the need for more research on disasters, displacement, personal losses, and the short and long term impacts on children and families. Additional research is therefore warranted to explain how adolescents cope and adjust after major disasters and to help communities deal with future disasters.

Specific trauma resulting from natural disasters include disturbances such as increased sleep problems, nightmares, childhood fears, withdrawal, anger, sadness, Post Traumatic Stress Disorder (PTSD), behavioral difficulties, and general emotional stress (Carr, 2004; Gaffney, 2006; Jones, Frary, Cunningham, Weddle, & Kaiser, 2001; Math, Girimaji, Benegal, Kumar, Hamza, & Nagaraja, 2006; McDermott & Palmer, 2002; National Institute of Mental Health, 2001; Osofsky et al., 2009). Natural disasters such

as Hurricane Katrina directly impact families by disrupting family routine and forcing family members to adjust to differing types of losses. These losses have both temporary and/or permanent and many involved the loss of family members, homes, friends, pets and possessions. Other losses include a sense of safety and security that existed prior to the disaster, along with pre-disaster routine and familiarity. Dysfunctional family behaviors also develop after a disaster as family systems became unbalanced beyond their ability to recover (Wells, 2006). Studies show that families who were relocated after natural disasters experienced a higher prevalence of psychiatric disorders, especially depression (Madird & Grant, 2008; Najarian, L., Goenjian, Pelcoviz, Mandel, & Najarian, B., 2001; Osofsky et al., 2009; Weisler, Barbe, & Townsend, 2006).

The National Center for Disaster Preparedness hosted a study in February 2006 of randomly selected hurricane evacuees as reported by Abramason and Garfield (2006). One aspect of the report discussed the ongoing mental health crisis for children and families displaced by Hurricane Katrina. Nearly half of parents surveyed reported having a child in their home with emotional or behavioral difficulties not present before the hurricane. These difficulties included feeling sad or depressed, being afraid or nervous, sleep difficulties or getting along with others. Following a natural disaster, parents may not be as attuned to their children's emotional stress, and children may not share their distress with parents because they fear further upsetting them (Lin, Sandler, Ayers, Wolchik, & Luecken, 2004; Swenson, Saylor, Powell, Stokes, Foster, & Belter, 1996; Vernberg, LaGreca, Silverman, & Prinstein, 1996).

This study discusses the psychological adjustment and adaptation of adolescents in Southeast Louisiana following Hurricane Katrina. Resiliency and coping are factors found in the literature when addressing adolescent development and protective factors in the face of stress and adversity (Baggerly & Exum, 2008; Fergus & Zimmerman, 2005; Goodman & West-Olatunji, 2008; Lin et al., 2004; Osofsky et al., 2009; Schnider, Elhai, & Gray, 2007; Warheit, Zimmerman, Knourb, Vega, & Gil, 1996). Fergus and Zimmerman (2005) discussed positive adjustment as an outcome of resilience. MacDermid, Samper, Schwarx, Nishida, and Nyaronga (2008) stated that childhood resilience could be examined from a developmental perspective and identified variables such as the ability to see the world from others points of view, and parental warmth and closeness as most likely to produce positive outcomes in the face of adversity and have the most psychological impact. Goodman and West-Olantunji (2008) defined resilience as the dynamic process where individuals and families face challenges and develop effective coping mechanisms. Frydenberg (2008) stated that there is a close relationship between adaptation and coping and that coping in the broadest sense is adaptation. Coping is seen as a process that extends from the management of stress and adaptation to the achievement of success and flourishing. The terms adjustment and adaptation for the purpose of this paper are similar in context to resilience and coping. Dass-Brailsford (2008) reported that coping decreases confusion and increases resilience by helping create physical, emotional and spiritual balance.

A great deal of previous research (Akybiyik, Coskun, Sumbuloglu, Tugcu, & Saybil, 2004; Basogul, Salcioglu, & Livanou, 2002; Greenberg & Keane, 2001; Hunt,

Al-Awadi, & Johnson, 2008, Kilmore & Gil-Rivas, 2008; Hensley- Malony & Varela, 2009; Math et al, 2006; Nikapota, 2006; McDermitt & Palmer, 2002; Richards & Bates, 2009; Robertson, Morse, & Barid-Thomas, 2009; Warheit et al., 1996) concerning the impact of trauma on children following various hurricanes and other natural disasters have been conducted. Jacobs, Vernberg, and Lee (2008) discussed the importance of supporting adolescents exposed to disasters. LaGreca, Prinstein, Vernberg, and Roberts (2002) and stressed the need for additional studies on children's disaster adaptation and Vernberg et al. (1996) explained that further investigation of children's coping skills following major disasters is needed to distinguish between coping methods alone and linkage between coping strategies and PTSD symptoms. Flynn and Nelson (1998) suggested that children have particular needs after large-scale disasters, and health care providers and families are often not prepared to meet these needs. Armsworth and Holaday (1993) stated that although awareness of how trauma impacts children and adolescents has increased over the last several decades, researchers still have much to learn to make the assessment and treatment more precise. Information on how adolescents adjust and adapt after a major disaster warrants additional study and would provide useful insight for counselors working with adolescents post-disaster.

Background of the Problem

Hurricane Katrina was the deadliest hurricane in the United States in seven decades and the most expensive natural disaster in this nation's history (Dass-Brailsford, 2008; Keesler, Galae, Gruber, Sampson, Ursano, & Wessely, 2008; Weisler, Barbara, & Townsend, 2006). Coming ashore from the Gulf of Mexico on August 29, 2005, Katrina

caused an estimated \$81.2 billion dollars in damage and the deaths of over 1,836 people across the Gulf Coast of the United States. The levee system in New Orleans failed which led to the flooding of 80% of that city. Most of the loss of life and property occurred in New Orleans, although the Mississippi Gulf Coast was also greatly damaged (Maggio, 2006).

St. Tammany Parish is located 30 miles east of New Orleans along the North Shore of Lake Pontchartrain and is home to the adolescent subjects of this research paper. This parish was greatly impacted by Hurricane Katrina, experiencing a large storm surge and hurricane force winds persisting for almost 20 hours. Wind speeds in the parish during the hurricane varied from 102 to 125 mph at the eastern end of the parish and from 61 to 102 mph in the western end. Lake Pontchartrain surrounds much of St. Tammany Parish, including the major cities of Covington, Mandeville and Slidell. Covington and Mandeville are in the western end of the Parish and received a 12-foot surge of lake water that flowed inland for several blocks. Slidell is situated in the eastern portion of the parish where Hurricane Katrina drove an 18-foot storm surge ashore that traveled six miles inland, creating great devastation for major parts of the city. Rain amounts of 2-18 inches recorded across the Parish in the time frame of August 28 through August 30 caused flooding in low lying areas and in flood plains adjacent to Parish rivers and bayous. More than 5,000 people in the parish were treated for illness and injury as a result of Hurricane Katrina. Six deaths in the parish were attributed directly to the hurricane. Approximately 1,000 parish residents evacuated prior to the storm. Many of these evacuees lived in the lower sections and evacuated to higher ground in the northern

part of the Parish. Residents from other parishes evacuated to St. Tammany Parish, both prior to and after the storm, increasing the population by approximately 50,000 residents (State of Louisiana, 2006).

Hurricane Katrina's damage to commercial property in St. Tammany Parish was estimated at almost \$120,000,000. Over 1,666 (14.8%) businesses in the parish were destroyed. The public school system lost 3 public schools and sustained damage to 49. The private school system lost 8 schools and 3 more were damaged. Both colleges in St. Tammany Parish were destroyed or damaged. The city of Slidell lost more housing units than the other cities in the Parish. Out of approximately 10,300 housing units in Slidell prior to Katrina, 4,000 units were seriously damaged by wind and/or flood. Of these 4,000, approximately 700 were total losses. Power was lost to 79,000 homes in the parish for weeks. Phone service was also lost for weeks in about 10,500 homes across the parish. Teenagers who could not return to school for 6 weeks were denied access to friends and others who could provide support (State of Louisiana, 2006). Disasters of this magnitude create dire living conditions and added stress and pressure in the household as parents in many cases lost their jobs when businesses were destroyed (Weisler, Barbee, & Townsend, 2006). Children in St. Tammany Parish continue to exhibit a terrific amount of stress and ongoing trauma (Volunteers of America, 2008).

Adult stress continues to impact the quality of life of those living in New Orleans. A recent study by the Tulane University Medical Center (Pope, 2009) found a threefold rise in heart attacks among their patients since Hurricane Katrina. In the two years before Katrina, the researchers found heart attacks accounted for 150 of the 21,229 patients

admitted to the downtown hospital. In the two years since the hospital reopened in early 2006, there were 246 heart attacks out of 11,282 patients - a change from about 0.7 per cent of admissions to nearly 2.2 per cent. The increase in heart attacks was expected as people trying to put their lives back on track after Katrina reportedly were neglecting their health. The threefold increase in heart attacks, however, was higher than anticipated. Dr. Charles Figly, a professor of social work at Tulane stated “Here, there are so many people who were affected and for so long because there was such widespread destruction, the Katrina affect will be with us for a long time” (Pope, 2009). Osofsky et al. (2009) stated that the devastation caused by Hurricane Katrina may be over in the minds of many people, but for the hundreds of thousands who lost homes and communities, the impact will be felt the rest of their lives.

Piotrowski (2006) argued that disaster events and emergency response systems are unpredictable, difficult to control and resist attempts to be effectively managed. He used Chaos Theory to explain how disasters easily expose the flaws between bureaucratic norms and emergency needs. Hurricane Katrina is a case example of Chaos Theory at work. Out of a sample of 1,200 Katrina survivors only 5% reported receiving help from the American Red Cross or FEMA (Piotrowski, 2006). Return to normal daily routine is important in preventing long-term trauma in adolescents. Peer support is another crucial protective factor that can offset negative family stress factors (Osofsky, et al., 2009). School is another significant aspect of life for children and adolescents and also serves to reduce stress levels (MacDermid, Samper, Schwartz, Nishida, & Nyaronga, 2008; Wolmer, Laor, Dedeoglu, Siev, & Yazgan, 2005). School structure, socialization with

peers and access to caring adults provide crucial resources for disaster recovery (Carr, 2004; Jacobs, Vernberg, & Lee, 2008; MacDermid et al., 2008; Sun & Hui, 2007.)

One major concern for Katrina victims is that ongoing daily stress may contribute to depression and hopelessness that can lead to possible suicide attempts (Weisler, Barbee, & Townsend, 2006). Warheit et al. (1996) reported a significant relationship between stress symptoms related to hurricanes and post-depression and post-hurricane suicidal ideation. McDermitt and Palmer (2002) reported increased symptoms of both depressed mood and clinical depression of youth surveyed over a 2-year period following a bushfire disaster in New South Wales. One in five adolescents experiences the symptoms of a mental disorder each year and 90% of teenagers who complete suicide each year were diagnosed with depression (Puskar, Sereikd, & Tusaie-Mumford, 2003). Suicide is the third largest killer of adolescents within the 15-24 age range, both in Louisiana and the United States (Berman, Jobes, & Silverman, 2006; Louisiana Adolescent Health Initiative, 2003; McKeown, Garrison, Cuffe, Waller, Jackson, & Addy, 1998; National Center for Health Statistics, 2005; Stanton, Spirito, Donaldson, & Bergers, 2003). Moses (2009) stated that adolescence is a time of increased identify consolidation and striving toward independence.

The 2006 Louisiana Survey asked respondents if families had sought counseling or other professional help for depression, anxiety or stress caused by hurricanes. Fifty-three percent of respondents indicated they felt depressed and 7 % said either they or someone in their immediate family had sought counseling. Five months later, 59% of respondents said they felt depressed and 11 % said either they or someone in their family

had sought counseling. Seventy percent of survey respondents lived in the New Orleans area and 63 % in New Orleans suburban parishes (Goidek, 2006). There is sometimes a perceived stigma for adolescents, especially boys; about receiving mental health help. This stigma may be devastating to the adolescents' self-image and sense of competency and factor into the decision for an adolescent to receive mental health services (Moses, 2009).

Purpose of the Study

This study examined adolescent psychological adjustment and adaptation in Southeast Louisiana following Hurricane Katrina. The level of grief and loss experienced by adolescents after a disaster can lead to feelings of hopelessness, depression and post traumatic stress disorder. The world that teenagers knew before Katrina has changed, and the extent to which adolescents adapt and adjust to this world is an important area of study (Fritz, 2005). Weisler et al. (2006) reported on a lack of providers of mental health services after Katrina and stated that 26% of households in one survey had at least one family member who required mental health counseling. They noted that only 16% of families were able to obtain needed mental health counseling.

The first purpose of this study was to discover how adolescents adapted and adjusted in Southeast Louisiana after the hurricane. Previous studies on adolescent psychological trauma stressed the importance of support (Everall, Altrows, & Paulson, 2006; Jacobs, Vernberg, & Lee, 2008; Kreuger & Stretch, 2003; Lin et al., 2004; National Institute of Mental Health, 2001; Pienaar, Beukes, & Esterhuyse, 2006; Shannon, Pharm, Lonigan, Finch, & Taylor, 1994; Sun & Hui, 2007). However, studies on Hurricane

Katrina have not dealt specifically with adolescent adaptation and adjustment. Grief, loss and family turmoil may contribute to the depression and hopelessness felt by adolescents. Consequently, these feelings may lead to at risk behaviors that could further exacerbate the trauma. Recent additions to the literature (Maggio, 2006; Osofsky et al., 2009; Rowe & Liddle, 2008; Vigil & Geary, 2008) have discussed family coping styles; psychological well-being and resiliency after Hurricane Katrina, but none of these studies were conducted in Southeast Louisiana outside of New Orleans specifically.

The second purpose is to provide mental health counselors and therapists with a selection of additional mental health issues and questions that need to be addressed by therapists prior to providing interventions with adolescents after a major disaster. During the intake session, therapists may ask questions about grief and loss, depression, anxiety, and post-traumatic stress following a natural disaster. Counselors should always inquire whether the youth is thinking of suicide as an option to escape the trauma they are experiencing. While some adolescents may answer this answer truthfully, it is better to build rapport and some level of safety and trust with the adolescent first. The youth may respond better initially to questions concerning the relationships they have with their parents and friends. Specifically, the adolescent should be asked what impact Hurricane Katrina has had on both their lives and the lives of their families. Therapists typically inquire about adolescent support systems that include parental support. This line of questioning concerning parental support falls into that category and is consistent with research by Grob, Klein, and Eisen (1983) that reported that the number one factor in underlying adolescent behavior is parental divorce, separation or death. Adolescents may

be more willing to talk about parental lack of support and their hostility towards one or both parents if this came about as a result of a hurricane. This study explores strategies adolescents used to adjust and to cope after the hurricane. Counselors usually check for resources during intake, but questions related to coping after a natural disaster should discern adaptive from maladaptive coping skills and encourage positive coping strategies (Baggerly & Exum, 2008).

The third purpose involves the possibility of helping save adolescent lives. The depth of depression experienced in many of these young lives often overwhelms clinicians treating adolescents. Callomachi (2006) reported that Katrina's young victims are experiencing trauma symptoms, behavioral problems, anxiety, and depression at twice the rate of control samples not exposed to disaster. St. Tammany Parish had the second highest rate of suicide in the state prior to Hurricane Katrina and since then the suicide rate has increase by 48%. Children in St. Tammany Parish continue to exhibit a great amount of stress and are experiencing ongoing trauma (Volunteers of America, 2008). Many severely depressed adolescents are having suicidal ideation, possibly as a result of hopelessness and depression brought about by life changes since Hurricane Katrina. Louisiana has implemented a statewide suicide prevention program called Suicide Prevention for all Louisianans, Training and Education, Awareness and Advocacy, and Research and Resources (S.T.A.R, 2005). Results of this study will be shared with the state in order to help mental health workers better assess adolescent coping skills after a major disaster in an effort to reduce mental health issues that could possibly lead to suicide. Specific understanding by clinicians and parents about the

relationship between Hurricane Katrina and adolescent hopelessness, depression, and suicide could ultimately save adolescent lives.

Research Questions

The following questions were addressed by this study:

RQ 1: To what extent did short and long term evacuation and relocation after Hurricane Katrina affect psychological adjustment and adaptation among youth in Southeast Louisiana?

RQ 2: In what ways did Hurricane Katrina impact the youth in Southeast Louisiana and to what extent did traumatic experiences lead to increased psychological disorders?

This dissertation hypothesized that adolescents continue to be impacted by Hurricane Katrina, but the level of impact is mitigated by adjustment and adaptation factors such as family members, friends and school. Adolescents whose homes were severely damaged or destroyed are more likely to become depressed, engage in risky behaviors, and abuse drugs and alcohol (Volunteers of America, 2008). Parental stress following the hurricane may lead to increased incidence of divorce. Adolescents from divorced families in single-parent homes are at higher risk for substance abuse and may be more at risk for suicide (Berman, Jobes, & Silverman; 2006; Cavaola & Lavender, 1999; Garnefski & Diekstra, 1997; Gould, Schaffer, Fisher, & Garfunkel, 1998). The Adolescent Psychopathology Scale-Short Form, known as the APS-SF (Reynolds, 2000) and a researcher-designed status survey on the impact of Katrina was administered to approximately 130 high school students in one civic and one church group in Southeast

Louisiana. Recommendations for additional follow-up counseling for students clinically impacted by Hurricane Katrina were made to parents or guardians. Factors identified from this study that helped adolescents adjust after Hurricane Katrina may help mental health providers and other adults provide better care for adolescents still coping with trauma following natural disasters.

Assumptions and Limitations

The first limiting factor involves the groups from which adolescents were sampled. Permission to conduct surveys in the public school system was denied by St. Tammany Parish school board officials. Consequently, other groups available to the researcher were utilized. Specifically, one church group and one community civic group were utilized to assess adaptation and adjustment levels. The utilization of these particular groups may present possible mitigating factors as far as the affects of hurricane trauma on these individuals. The nature of these groups is supportive and this group impact was not measured, but should be considered when examining the overall results. The second limiting factor is that results may not be generalizable beyond the specific population from which they were drawn. The third limiting factor is that there is no pre-disaster baseline data for comparison and data is post-disaster and self-reported.

Several delimitations form the foundation on which this study is based. First, this study does not attempt to address all the factors of adolescent adjustment and adaptation. Due to the catastrophic impact on families in Southeast Louisiana from Hurricane Katrina, research questions will be utilized to ascertain how the adolescents and their families were impacted by life stressors brought about by the hurricane. Second, this

study does not propose any specific new counseling techniques to deal with adolescents who continue to be impacted by Hurricane Katrina.

Definition of Terms

Several terms need to be defined for this research. The first definition is adolescence. The term adolescence for the purposes of this research will include individuals from the age of 11 to 20 (Jaffe, 1998). Jaffe states there are three groups of adolescents. The first group is early adolescence from age 11-13, the second group is middle adolescence from age 14-18 and the last is late adolescence from age 18 to 20. Adolescents surveyed for this study were from the age of 12 to 19 and predominately in the early and middle adolescence groups with one student in the late adolescent group. The second definition is resilience. Resilience is often described as a steady personality trait that protects individuals from the negative effects of risk or adversity (Everall, Altrows, & Paulson, 2006). Burnham (2009) defined resilience as “a set of qualities that foster successful adaptation and transformation despite risk and adversity”. Maggio (2006) likened resiliency to the ability to bounce back but referenced a definition from Masten and Reed (2002) who defined resiliency as “the consistent positive adaptation in the face of significant adversity or risk”. Russoniello et al. (2002) used the term “coping mechanism” to describe how adolescents cope after a natural disaster. For the purpose of this study, adjustment and adaptation will entail resilience and coping mechanisms. The scores on the Adolescent Psychological Profile-Short Form (Reynolds, 2000) in the areas of Generalized Anxiety Disorder, Post Traumatic Stress Disorder, Major Depression,

Eating Disorder, Suicide Ideation, and Self-concept will be used to measure the level of psychological adjustment and adaptation among the youth after Hurricane Katrina.

Chapter Summary

The impact of Hurricane Katrina on the Gulf Coast was staggering. The combined devastation in the impacted areas makes loss adaptation more difficult for children and adolescents. Many families were separated during the storm. Parents, many who lost all they had, were not always able to adequately support children in need (Madrid & Grant, 2008; Osofsky et al., 2009; Vigil & Geary, 2008; Weisler, Barber, & Townsend, 2006). Those with preexisting mental illness or with previous trauma history generally fare poorly in a disaster (Fritz, 2005; National Institute of Mental Health, 2001). Further study of adolescent adjustment and adaptation is crucial.

Adolescents exposed to traumatic events such as hurricanes may suffer long-term behavioral and emotional changes (Osofsky et al., 2009; Swenson et al., 1996; Warheit et al., 1996). The severity of the symptoms depend on parental response, resiliency of the individual, and the impact of friends and school (Fergusson & Lynsky, 1996; Math et al., 2006). Natural disasters can impact adolescents' psychological functioning, especially if there is high exposure to the incident and post disaster recovery is difficult. Substantial numbers of adolescents and children who are victims may experience moderate to severe psychological stress years after the disaster (LaGreca et al., 2002; Osofsky et al., 2009). Further study of adolescents' behaviors in response to natural disasters would provide clinicians with information to better help those in need (National Institute of Mental Health, 2001; Osofsky et al 2009; Pfefferbaum, Houston, North, & Regens, 2008; Rowe

& Liddle, 2008; Russoniello et al., 2002). Understanding how adolescents adapt and adjust to the psychological distress that occurs after a natural disaster is crucial to help prevent further psychological health problems. This information may also help in preparing counselors to better respond to adolescent trauma after a major disaster such as Hurricane Katrina. The present study addressed the extent to which short and long term evacuation and relocation after the hurricane affected psychological adjustment and adaptations among youth in Southeast Louisiana the extent to which traumatic experiences led to increased psychological disorders.

CHAPTER TWO: REVIEW OF THE LITERATURE

Prior to Hurricane Katrina, few studies on how children and adolescents adapt to disaster existed. As psychologists and counselors have attempted to analyze the impact of the storm, the numbers of studies have increased, but few specifically address the overall factors of psychological impact, treatment, resilience, and the use of coping mechanisms as families and individuals. The available literature on the impact of natural disasters on children and adolescents indicate that this population reacts to trauma in a similar manner to adults (Broussard, Myers, & Meaux, 2008; Field, Seligman, Scafidi, & Schanberg, 1996; National Institute of Mental Health, 2001; Shaw, Applegate, & Schorr, 1996; Warheit, Zimmerman, Khoury, Vega, & Gil, 1996). Other studies (Cohen, Mannarina, & Deblinger, 1996; Kilmar & Gil-Rivas, 2008; Kirk & Madden, 2003; LaGreca et al., 2002; Pfefferbaum et al. (2008); Silverman & La Greca, 2002) reveal that a large proportion of children and adolescents experienced serious psychological distress after a major natural disaster. Additional research (Jacobs, Vernberg, & Lee; 2008; Rowe and Liddle; 2008) indicates that adolescents may be more affected by disasters than younger children and are more vulnerable than adults to feelings of helplessness or of being overwhelmed.

The current chapter will emphasize general literature on trauma and coping skills following natural disasters. The concepts, tenets, and theories of psychological trauma and resilience will be examined in addition to various studies on hurricanes and their impact on children and adolescents.

Theoretical and Conceptual Framework

Discussion of the prevalent theories associated with adolescence, adolescent psychological trauma and resilience is pertinent to this research. Erickson's (1968) theories of identity development outline eight stages in the human lifespan. Each stage poses conflicts or crises that must be resolved in order to constructively move on the next stage of development. Failure to resolve these crises may negatively affect a person's development. During the teenage years, the lifespan issue of identity versus role confusion must be addressed as adolescents ask the question "Who am I?" in order to form their own identity (Pienaar, Beukes, & Esterhuysen, 2006; Portes, Sandhu, & Longwell-Grice; 2002).

Kalter (1987) also discussed adolescent developmental tasks stating that adolescents must de-idealize their parents and form a sense of themselves apart from their parents while simultaneously forming closer peer relationships. According to Kalter (1987), adolescents have three possible solutions to competing demands between parents and their peers. The first is for the teenager to retreat from adolescent behavior in terms of dress and interests. The teenager may appear naïve and unkempt in their grooming. The second occurs when the adolescent appears much older in dress and interests. According to Kalter (1987) noted that these teenagers may appear stable and mature, but they fail to complete their adolescent separation tasks and miss opportunities to grow with their peers. The third possible resolution is best exemplified by the rebellious teenager displaying antisocial behavior that is in constant conflict with parental authority.

This antisocial behavior and conflict can lead to increased behavioral problems and juvenile delinquency.

Erickson (as cited in Eckestein, Rasmussion, and Wittschen, 1999) stated that “the overall task of the individual is to acquire a positive ego identity as he or she moves from one state to the next”. As applied to adolescents, Piaget (as cited in Eckestein, Rasmussion, and Wittschen, 1999) used the term “formal operational thought” in describing cognitive processes that enable young people to think more on an abstract level. The way adolescents view the world has a major impact on their understanding of causation of traumatic events (Armsworth & Holiday, 1993). Armsworth and Holiday (1993) also discussed how an awareness of the child’s stage of cognitive development is the core feature in understanding how adolescents make sense of traumatic experiences.

Kirk and Madden (2003) stated that adolescence is a time of major cognitive and emotional growth and stressful life changes. Frydenberg (2008) reported that adolescents face a multitude of ongoing life stressors that increase the risk of depression, behavioral problems and anxiety disorders. It was noted that when a major trauma occurs during adolescence, the teenager can become at risk for long-lasting developmental coping difficulties. Additionally, exposure to chronic stressors caused by trauma may lead to dramatic changes in worldview as adolescents look more negatively at the world and become less trusting. This in turn makes adolescents more vulnerable to the development of psychological stress when exposed to future stressors (Grant, Behling, Gipson, & Ford, 2003; Warheit et al., 1996). Environmental, contextual and family factors all contribute to post-disaster stress felt by children and adolescents. Factors that may determine the

level of dysfunction experienced by children and adolescents after a natural disaster include age, gender, and ethnicity, level of trauma exposure including previous exposure to trauma, coping methods and access to social support (La Greca, Silverman, & Wasserstein, 1998; National Institute of Mental Health, 2001; Osofsky et al.; 2009; Russoniello et al., 2002).

Discussions of general traumatic stress models, especially as they relate to children, are warranted in order to better understand the factors that impact trauma and associated psychological stress. Pynos, Goenjian, and Steinberg (1998) proposed a detailed developmental model of traumatic stress that discussed the role of various factors that impact traumatic stress development over time. They also developed a stress model that explained how children's ecology influences the outcomes of post-traumatic interventions with children. Their model includes factors such as parental functioning, the developmental cycle of the family, and interactions with school and peers. Longitudinal studies cited by Pynos et al. (1998) indicated that selective variables such as post-traumatic stress disorder, depressive disorder, separation anxiety disorder, and grief reactions contributed to post-disaster onset and progression of co-morbid psychopathologies. Gaffney (2006) stated that childhood trauma responses are dependent on a number of factors such as developmental stage, nature of the specific threat, and loss of significant others, individual coping skills and past traumatic experiences.

Richards and Bates (1997) detailed the effects of traumatic stress and categorized them as cognitive, affective, behavioral and somatic-physiological. Cognitive symptoms included such things as distortions, intrusive memories, distressing dreams and poor

attention span. Affective symptoms included such things as anxiety, panic, fear, excessive worry, phobias and fear of retraumatization. Behavioral symptoms included regressive behaviors, poor concentration, retelling the event, and impulsiveness. Somatic-physiological symptoms included low tolerance for stress, startle and sleep disorders and fatigue. A similar model by Cohen et al. (2006) showed that children's psychological symptoms following exposure to a traumatic incident may be broken down into five categories: affective, behavioral, cognitive, complex PTSD and psychobiological.

Affective Trauma Symptoms

Cohen et al. (2006) reported that one category of childhood trauma symptoms consists of depressive symptoms that can manifest as a general distrust of people and the world. These depressive symptoms may occur in conjunction with symptoms of Post Traumatic Stress Disorder. Children may also display anger after the disaster and believe that the event was unfair and that their behavior was insufficient for the trauma to occur. Severely traumatized children may become highly sensitive or over-reactive to behaviors reminding them of previous trauma. Affect deregulation and quick unexpected changes in affective state and problems coping with negative affective states may occur (Cohen et al., 2006). These findings are similar to those reported by Jacobs et al. (2006) which showed that adolescents struggle with feelings of guilt or shame over things they did or did not do during the disaster. These feelings can lead to depressed mood and a feeling of being disconnected with others. Some teenagers externalize their anger towards others they perceive to have contributed directly or indirectly towards the disaster (Jacobs et al.,

2008). Jacob et al. (2008) also reported that children are more vulnerable than adults to feeling helpless and overwhelmed during traumatic events. This is consistent with the National Institute of Mental Health (2001) research that found children ages 5-11 and adolescents 12 -17 were at greater risk for exhibiting guilt for not being more seriously injured and emotional numbing after a disaster.

Affective trauma symptoms include fear, depression, anger and frequent mood changes. Cohen et al. (2006) stated that fear in life threatening situations causes the release of chemicals in the brain that can reinforce anxiety. The fear response can also reoccur in children when related occurrences remind them of the traumatic event. General anxiety may occur when an event triggers previous trauma, leading to feelings of insecurity and hyper-vigilance. Jacobs et al. (2008) reported that adolescents may be consumed with fear that the disaster will be repeated. Natural events such as rainfall may bring on fear that the hurricane will reoccur. McDermott and Palmer (2002) studied several thousand children and adolescents who were impacted by a bush fire in New South Wales in 1994. They reported post-disaster depressive symptoms were associated with adolescent trait anxiety, school grade, evacuation experience and emotional distress scores. Symptoms of emotional distress were associated with damage to the adolescents' homes and the perceived threat to themselves and parents. Younger students in grades 8-10 had the lowest depression scores, with scores increasing in grades 11 and 12. Research by McDermitt and Palmer (2002) indicated increased symptoms of both depressed mood and clinical depression in female children and adolescents when compared with male children and adolescents. Shannon et al. (1994) reported that

symptoms that were related to emotional processing or reaction such as emotional avoidance or numbing were consistently higher for female children. Male students reported higher levels of symptoms that were related to behavioral or cognitive factors such as memory and attention span.

Behavioral Trauma Symptoms

Another category of children's trauma symptoms, according to Cohen et al. (2006) is behavioral. This category involves children trying to avoid painful feelings. When children cannot avoid their feelings, they may develop emotional numbing or dissociation. Other studies noted that traumatized children are at greater risk for substance abuse, self-injury such as cutting or burning, and suicidal behaviors (Berman, Jobes, & Silverman, 2006; Cohen et al., 2006; Jacobs, Vernberg, & Lee, 2008, Warhart et al. 1996). Disaster related stress may increase suicidality among adolescents. Recently Kessler et al. (2008) reported increased suicidal ideation across the entire Hurricane Katrina impact area. Meta-analyses of the literature (Fritz, 2005; Hardin et al.; 2002; Hebert et. al., 2007; La Greca & Prinstein, 2002; LaGrecca et al., 1998; National Institute of Mental Health, 2001) indicated that children's psychological behavioral difficulties such as anxiety, behavioral problems, and inattention increase following natural disasters. These reactions are consistent with other research (Field et al., 1996; Flynn & Nelson, 1998; Osofsky et. al., 2009) that found preadolescents and adolescents may exhibit symptoms after disasters such as withdrawal, isolation, numbing, depression, sadness, refusal to do chores, antisocial behavior, decreased school performance, sleep disturbances, loss of interest in hobbies, increased risk-taking behavior, conduct problems

and substance abuse. Similar findings were reported by the National Institute of Mental Health (2001) that reported adolescents to be at a greater risk for substance abuse problems, suicidal thoughts, academic decline, sleep disturbance and confusion after trauma exposure.

Cognitive Trauma Symptoms

Cognitive trauma is another category of symptoms according to Cohen et al. (2006). Children may develop irrational beliefs as to why the trauma occurred. These beliefs may include blaming others or self-blame as a means of justifying what happened. This is typically done as a means of reorienting their world to one that seems more fair and predictable. Traumatized children may also focus on faulty or false cognitions that serve to reinforce both negative expectations of other people and self-destructive views (Cohen et al., 2006). Callimachi (2006) reported that one Gulf Coast adolescent believed there was no way out but suicide after the storm stating “It’s like I can’t see my future any more”. Armsworth and Holaday (1993) stated that childhood trauma is significant because uncontrolled terrifying experiences, such as those experienced after a trauma, have major effects on the central nervous system and cognitive functions that are still maturing.

Post Traumatic Stress Disorder

Post Traumatic Stress Disorder (PTSD) is yet another category of trauma symptoms that may appear in children and adolescents after a major natural disaster (Cohen et al., 2006). Adolescents seem to be particularly at risk for the development of problems in multiple realms after trauma. These problem areas may include affect

regulation, interpersonal relationships, self-esteem, academic functioning and mood instability. Cohen et al. (2006) stated that these problem areas fall within the category of complex PTSD. This is consistent with research by Pfefferbaum et al. (2008) stating that traumatic grief factors in children may manifest, in addition to PTSD symptoms, revenge, yearning and impaired functioning. Carr (2004) suggested that PTSD is a real possibility following natural disasters such as hurricanes. LaGreca et al. (2002) indicated that approximately 30% to 50% of youth affected by hurricanes will develop moderate to severe symptoms of PTSD and 5% to 10% of adolescents may develop a full diagnosis of PTSD.

Children impacted by Hurricane Katrina reported high levels of stress.

Callimachi (2006) reported that of the first 1,000 children screened by the Louisiana State University Health Sciences Center, 27 % displayed symptoms of trauma that included flashbacks, nightmares, increased anxiety and bedwetting. Osofsky et al. (2009) studied 7, 258 children and adolescents in grades 4-12 from the heavily damaged parishes of Orleans, St. Bernard, Plaquemines and St. John. Fifty-two percent of 4th to 6th graders and 40.4 % of 9th to 12th graders met the cut off scores for mental health referral. Osofsky et al. (2009) stated that after Hurricane Katrina factors such as displacement, home damage, and parental unemployment were associated with PTSD, specifically symptoms such as re-experiencing events and hyper-arousal. Decreased access to supportive social relationships was reported as a significant predictor of PTSD symptoms (LaGreca, Silverman, & Wasserstein, 1998; Vigil & Geary, 2008).

Findings reported by Lamberg (2006) reported that 1 in 3 children in grades 4-12 were separated from parents sometime after the hurricane. Children also indicated that 1 in 5 had experienced a death of a family member or friend and almost half had parents who were unemployed. Lamberg's research reported that 31% of children met the criteria for mental health referral exhibiting such symptoms such as irritability, headaches, sleep disturbance and nightmares. Rowe and Liddle (2008) reported that young victims of Hurricane Katrina are experiencing trauma, behavioral problems, anxiety and depression at twice the rate of control samples not exposed to disaster.

One study (Wheeler, 2006) suggests that cases of acute stress reactions were fewer than expected after Hurricane Katrina. One theory given for this was that children might be more able to change and adapt when it comes to basic needs and nurturance. Children also tended to remain with primary care givers during the hurricane rather than experiencing the additional stressors of separation anxiety.

Garrison, Bryant, Addy, Spurrier, Freedy, and Kilpatrick (1995) found a 7.3 % rate of PTSD among adolescents six months after Hurricane Andrew, with most of the survey sample exhibiting some PTSD symptoms. Vernberg et al. (1996), concerned about children's psychological reactions after a catastrophic event, also discussed the prediction of posttraumatic stress symptoms in children following Hurricane Andrew. Rowe and Liddle (2008) reported that after a major earthquake in Italy, untreated youth experienced increased PTSD symptoms. Russoniello et al. (2002) reported that children whose homes were damaged during Hurricane Floyd more likely to experience PTSD symptoms when compared with children whose homes did not flood.

Gender appears to be a modifier of how well children handle adversity. There is discussion in the literature (Durakovic-Belko, Kulenovic, & Dapic, 2003; Vernberg et al., 1996) indicating that female adolescents were more prone to PTSD symptoms following a major trauma. Female children whose homes were flooded were more likely to have severe PTSD symptoms. This finding of increased PTSD among female children is consistent with other studies (Durakovic-Belko, Kulenovic, & Dapic, 2003; La Greca, Silverman, & Wasserstein, 1998; Osofsky et al., 2009; Russoniello et al., 2002) and may be indicative of how children of different genders handle stress.

Psychobiological Trauma Symptoms

Another trauma symptom discussed by Cohen et al. (2006) is psychobiological. The cognitive changes of adolescence are difficult enough to navigate and create challenges for both the adolescent and parents (Eckstein, Rasmussen, & Wittschen, 1999). Gaffney (2006) reported that when stress or trauma occurs, the number of neurotransmitters in the brain may increase or decrease. This process is termed a hypothalamus pituitary-adrenal response. Childhood trauma may also cause smaller brain size, especially in the corpus callosum part of the brain that connects the right and left hemispheres of the brain. Richards and Bates (1997) stated that somatic-physiological trauma symptoms in children include hyper-arousal, low stress tolerance, increased startle response to reminder stimuli, and sleep disorders and fatigue.

The Role of Parents

Parent reactions play an important role in childhood anxiety levels following a natural disaster (Callimachi, 2006; Fergusson & Lynskey, 1996; Greenburg & Keane,

2006; McDermott & Palmer, 2002, Osofsky et al., 2009; Rowe & Liddle, 2008; Silverman & La Greca, 2002). Swenson et al. (2002) reported that the key variable predicting problems after Hurricane Hugo was significant stress of the mother due to the storm's impact. Parents with good parenting skills may experience difficulty maintaining normal routines after a disaster that impairs their ability to help their own children. Parents whose skills with their children were strained before the natural disaster were increasingly more likely to experience difficulties helping their children after storm-related trauma (Cohen, Mannarino, & Deblinger; 2006). Several studies (Flynn & Nelson, 1998; Rowe & Liddle, 2008) reported that individual parental psychopathology may be a more important factor in gauging youth stress reactions following a disaster than the actual disaster itself. Individual parental psychopathology also contributes to the development of PTSD in children following a natural disaster. Fritz (2005) stated that the reassurance of parents or other familial adults was crucial in adapting to trauma brought about by Hurricane Katrina.

Beam et al. (2002) determined that the protective factors for development of adolescent depression were in the areas of perceived parental sanctions of parents, friends, VIPs and parental warmth and acceptance. These findings are similar to research conducted by Crosnoe, Erickson, and Dornbusch (2002) who reported that parental monitoring, parental involvement, and household organization serve as protective functions against adolescent depression. They also found that bonding to teachers, and academic achievements were important protective factors. The National Center for Disaster Preparedness hosted a study in February 2006 of randomly selected hurricane

evacuees as reported by Abramason and Garfield (2006). One facet of the report discussed the ongoing mental health crisis for children and families displaced by Hurricane Katrina. Nearly half of parents surveyed reported having a child in their home with emotional or behavioral difficulties not present before the hurricane. These difficulties included feeling sad or depressed, being afraid or nervous, sleep difficulties or getting along with others.

Mediating factors of stress outcomes for children and adolescents include individual characteristics, positive or negative emotional experiences during the event, physical damage severity and level of exposure to the event (Jones, Frary, Cunningham, Weddle, & Kaiser; 2001; Osofsky et al., 2009; Pfefferbaum et al., 2008; Warheit et al., 1996). Characteristics of family members before the disaster, interruption of family routine, school support systems, individual characteristics, and general life events are also listed as predictors of victims' psychological stress. Gaffney (2006) reported that previous trauma (especially trauma dealing with attachment and trust), poor social supports, and indirect or direct exposure to death can further impede a child's healing process. McDermitt and Palmer (2002) stated that parental overreaction or non-competent response to traumatic events is associated with increased levels of child anxiety.

Swenson et al. (1996) found that after Hurricane Hugo parents often avoided discussing traumatic events with children. They sometimes felt so overwhelmed with their own concerns and tasks after the disaster that children often had to learn to cope by themselves. They found that increased distress of mothers due to hurricane difficulties

was a significant predictor of children's behavioral difficulties. Recent research by Madrid and Grant (2008) on mental health lessons learned from Hurricane Katrina stated that the well-being of individuals who care for children must be met. The concrete, employment, and psychological needs of parents, guardians, teachers, and other professionals whose duty is taking care of children is crucial to enhanced recovery of these children in disaster areas (Madrid & Grant, 2008).

Bowlby's (as cited in Osofsky et al., 2009) attachment theory supports the assumption that parental separation is a significant stressor that can lead to psychological distress especially in times of crisis. Separation from parents and parental preoccupation with disaster was noted as being positively associated with PTSD following a study of children after a bushfire in New South Wales in 1994 (McDermitt & Palmer, 2002).

Beam, Gil-Ravas, Greenberger, and Chen (2002) researched 11th grade adolescent depression and addressed risk protection for this age group, arguing that adolescents from dual parent and intact families reported less peer pressure to engage in problem behaviors when compared to single parent or stepparent families. Marttunen, Henriksson, Markus, Isometsa, Heikkinen, and Aro (1998) suggested that the life trajectories of children from divorced families contain more distress than those of children from intact families. This is consistent with literature reviews reporting that adolescents from divorced families also experience increased risk factors such as hopelessness and anger that are associated with suicidal ideation and attempts (Berman, Jobes, & Silverman, 2006; McKeon et al, 1998; Portes, Sandhu, & Longwell-Grice,

2002). Increased divorce rates and custody battles added additional pressure to children and adolescents struggling in a post Katrina environment (Clemenston, 2006).

Other findings indicated that children of single parents are at higher risk for PTSD due to the loss of emotional support after a disaster. Parental support is crucial to adjustment and adaptation after a natural disaster such as a hurricane. Abramason and Garfield (2006) reported that parents, especially mothers interviewed, scored low on a standardized mental health screening used to indicate the impact of poor mental health on daily activities. Over half of the female caregivers showed screening levels of psychiatric problems such as depression or anxiety disorders. The study found that children whose parents scored very low on the mental health screening were two and half times more likely to have experienced emotional or behavioral problems after Hurricane Katrina. Female caregivers were six times more likely to report they were having problems coping with daily parenting demands (Abramason & Garfield, 2006).

Family utilization of community resources after Hurricanes Andrew and Katrina resulted in decreased numbers of stress, anxiety and PTSD cases among children and adolescents when compared to families not utilizing community services (Vernberg, 1998; Vigil & Geary, 2008).

Coping

Frydenberg (2008) discussed coping resources for adolescents including having friends, support from parents, adequate housing and a stable family life. Natural disasters such as Katrina may remove many of these coping resources, including family and housing. Callimachi (2006) reported that more than 5,000 children were separated from

their families in the early days following Hurricane Katrina. Osofsky et al. (2009) reported that families who lost their homes during Katrina and were forced to live in alternative housing, such as travel trailers, suffered a sense of loss that disrupted the children's routines, creating stress and complicating their ability to cope.

Hardin et al. (2002) indicated that the belief that one can cope with life stressors and reach the desired outcomes serves to ease mental distress. Frydenberg (2008) stated that the adolescents' belief in their ability to solve their own problems and obtain control over the resolution of the problem was positively related to their problem solving abilities. Previously discussed research (Jacobs et al., 2008, Rowe & Liddle, 2008) indicated that helplessness and lack of trust detracts from normal coping skills resident in children and adolescents.

Other studies showed that social support remains crucial during trauma and acts to reduce adolescent mental distress (Foa, Stein, & McFarlene; 2006; Hollister, Wagner, Foshee, & Jackson, 2001; La Greca, Silverman, & Wasserstein, 1998). Vernberg et al. (1996) argued that studies on children's coping skills following natural disasters are a relatively new field of research and that research on how children coped with other stressful events such as illness and medical procedures is not sufficient to predict how children will react to major disasters. Major disasters are usually catastrophic events that differ from other life events because of the impact and severity of the life disruption experienced by children and their families (Foa et al., 2006; Shaw et al., 1996; Vernberg et al., 2008).

Durakovic-Belko, Kulenovicovic, and Dapic (2003) examined risk and protective factors as well as coping skills among adolescents who experienced war in Sarajevo. Perceived low levels of social support from family and friends were reported as a high risk factor for depression symptoms. The most effective coping skills utilized with the worst traumatic war experiences were daydreaming, relation and reinterpretation of events.

Vernberg et al. (1996) found four coping variables that were positively correlated with overall PTSD symptoms. These variables were positive coping, blame-anger, wishful thinking and social withdrawal. The study indicated that intense stressors resulting from a natural disaster may initially bring out a variety of positive and negative coping mechanisms. Negative coping skills such as blame and anger were linked to the highest level of PTSD symptomatology in this study of Hurricane Hugo victims. The unifying coping strategies theme involved purposeful non-threatening and nondestructive actions either physically or psychologically in response to stressful feelings (Vernberg, 1996).

Resilience

The term resilience is often referred to when describing a stable personality trait or ability that protects individuals from the negative effects of adversity (Everall, Altrows, & Paulson, 2006). Fergus and Zimmerman (2005) defined resilience as “the process of overcoming the negative effects of risk exposure, coping successfully with traumatic experiences, and avoiding negative trajectories associated with risks”. Hollister-Wagner, Foshee, and Jackson (2001) reported that adolescent resiliency is the

ability of individuals to thrive in spite of negative circumstances. Everall, Altrows, and Paulson (2006) discussed how resilience research during the last two decades has focused on constructive behaviors and life-enhancing competencies. Robertson, Morse, and Baird-Thomas (2009) indicated that inclusion of resiliency factors with adolescents after a major disaster may help in understanding why well being is influenced by exposure to disaster. Researchers have begun to see resilience as a dynamic process that changes over time (Fergus & Zimmerman, 2005).

Fergusson and Lynsky (1996) found six factors that impacted adolescent resiliency. These factors were intelligence and problem-solving abilities, gender, external interests and affiliations, parental attachment and bonding, childhood temperament and behavior and peer factors. They reported that resilient young people were characterized by higher levels of intelligence and problem-solving skills than non-resilient peers. Research reported in the literature (Frydenberg, 2008; Masten, Hubbard, Gest, Tellegan, Garmezy, & Ramirez, 1999) stated that better intellectual functioning was associated with good resiliency outcomes in the face of adversity. Masten and Coatsworth (1998) found that the two most important characteristics of resilient children and adolescents were caring, pro-social adults and good intellectual functioning. Proximity to the caregiver was also a major factor. Good intellectual functioning indicates higher IQ scores and requires an assortment of information processing skills that can also be utilized when dealing with adversity (Masten & Coatsworth, 1998).

Similar findings were reported in research by Hauser, Yieyra, Jacobson, & Wertlieb (1985), who suggested that there are three major domains of adolescent resiliency. The first domain is the child's personality characteristics. Self-esteem, impulse control, and increased communication skills were noted as characteristics of stress-resistant children. The second domain deals with family characteristics including parent strengths and vulnerabilities. This family domain predicted that adolescents coming from homes with good supervision and fair and equitable discipline were better protected from risk. The third domain is the characteristics of the community involving social support and strains. The school environment is especially important in developing resiliency among adolescents, as are informal assistance of peers, older friends, ministers and teachers (Hauser et al., 1988).

Fergus and Zimmerman (2005) reviewed adolescent resiliency from the viewpoint of factors that kept teenagers from harmful behaviors involving substance use, violence and sex. They reported that parental factors are vital for helping youth remain resilient through adolescence. These parental factors include support, monitoring and communication skills. Lin et al. (2004) researched resiliency in parentally bereaved children and adolescents and reported that children's resiliency was positively predicted by the surviving caregiver's warmth and discipline. Negative resilience was predicted if the caregiver was experiencing mental health problems. McDermitt and Palmer (2002) reported that parental overreaction or inadequate response to the traumatic event was associated with greater child anxiety.

Chapter Summary

The literature available on disasters and their impact on children and adolescents indicates that this population reacts to trauma in a similar manner as adults (Costa, Weems, & Pina, 2009; Field, Seligman, Scafidi, & Schanbert, 1996; Shaw, Applegate, & Schorr, 1996; Warheit, Zimmerman, Khoury, Vega, & Gil, 1996). Other studies (Armsworth & Holaday, 2001; Cohen, Mannaring, & Deblinger, 1996; Durken, Khan, Davidson, Zaman, & Stein 1993; Greca & Prinstein, 2002; Kirk & Madden, 2003; LaGreca et al., 2002; Vigel & Geary, 2008) reveal that a large proportion of children and adolescents experience serious psychological distress after major natural disasters such as hurricanes.

Warheit et al, 1996) found that children's psychological or behavioral difficulties such as anxiety, behavioral problems, and inattention increase following natural disasters. Children and adolescents may also exhibit symptoms of disaster-related fears and depression, withdrawal, isolation, numbing, sadness, refusal to do chores, antisocial behavior, decreased school performance, sleep disturbances, loss of interest in hobbies, increasing risk taking behavior, conduct problems and substance abuse after natural disasters. Cohen et al. (2006) showed that children's psychological symptoms following exposure to a traumatic incident may be broken down into five categories: affective, behavioral, cognitive, complex PTSD and psychobiological. Each of these areas is significant, especially complex PTSD.

Pre-trauma factors also play a role in adolescent reaction to trauma. Beam et al. (2002) determined that protective factors for development of adolescent depression lay in

the areas of perceived parental sanctions of parents, friends, VIPs and parental warmth and acceptance. Fergusson and Lynskey (1996), Gaffney (2006), and Masten et al. (1999) reported that resilient young people were characterized by higher levels of intelligence and problem-solving skills than non-resilient peers. Masten and Coatsworth (1998) reported that the two most important characteristics of resilient children and adolescents were caring pro-social adults and good intellectual functioning. La Greca et al. (2002) argued that future research in understanding children's and adolescent's disaster reactions is needed to answer the question of why certain variables are important and how those processes vary in relating them to child development. Understanding how adolescents adjusted and adapted to the impacts of Hurricane Katrina would aid in answering this question and understanding what factors contribute most strongly to the development of resilience.

Russoniello et al. (2002) stated that the formal study of childhood stress resulting from natural disasters is an important and growing science. Everall, Altrows, and Paulson (2006) stated that the study of how adolescents thrive and survive in the midst of difficult life circumstances will add to understanding adolescent development and provide greater understanding of how future mental health interventions should build on adolescent strengths. Recent additions to the literature discussed family coping styles and resiliency after Hurricane Katrina. For example, Osofsky et al. (2009) and Vigil and Geary (2008) compared the family coping styles of adolescents who lost their homes as a result of the hurricane and were temporarily misplaced with a sample of demographically matched adolescents who did not experience displacement and relocation. Rowe and

Liddle (2008) discussed the importance of family involvement in the post-disaster recovery after Hurricane Katrina.

Adolescent adjustment and adaptation measures in Southeast Louisiana following Hurricane Katrina have not been determined. Gill (2007) stated as the impact of Hurricane Katrina unfolds, it is important for social scientists to continue researching the disaster. Rowe and Liddle (2008) stated the potential for new knowledge is high in the aftermath of Hurricane Katrina. Robertson, Morse and Baird-Thomas (2009) reported that inclusion of resiliency factors would be useful in better understanding of well-being of adolescents after a major disaster. Research on adolescent adjustment and adaptation would prove useful to mental health providers in Southeast Louisiana and other areas of the country in the aftermath of a major natural disaster.

CHAPTER THREE: METHODOLOGY

The purpose of this study was to gain an understanding of how adolescents psychologically adjusted and adapted to adversity in their lives after Hurricane Katrina hit the Gulf Coast on August 29, 2005. Two major research questions guided this research: RQ1) to what extent did short and long term evacuation and relocation after Hurricane Katrina affect psychological adjustment and adaptation among youth in Southeast Louisiana? RQ2) in what ways did Hurricane Katrina impact the youth in Southeast Louisiana and to what extent did traumatic experiences lead to increased psychological disorders? This dissertation attempted to answer these questions and to provide data to mental health practitioners to better understand what helps children and adolescents cope with trauma after a natural disaster.

The research explored various aspects of adaptation and adjustment among adolescents after Hurricane Katrina. Two survey instruments were utilized in the research. The first was the Adolescent Psychopathology Scale-Short Form (APS-SF; Reynolds, 2000) that was administered to 7th-12th graders. The second was a researcher-designed questionnaire that was administered to all students taking the APS-SF. This survey is a closed-ended questionnaire asking respondents to circle the number or letter that appears before the answer.

Selection of Subjects

Convenience sampling was utilized in the selection of subjects. Merriam (1998) defined convenience sampling as an individual or group selected based on time, money, location, and availability of sites. Since access to students in public schools was denied

to this researcher, two groups readily available that represented a cross section of the New Orleans greater metropolitan area were utilized. The subjects in this study are youth group members from one church and one civic organization in St. Tammany Parish, Louisiana which is located in the New Orleans metropolitan area. Approximately 130 members of these groups, consisting of students ages 13-19 were selected for the survey utilizing convenience sampling. Parental permission slips were sent home with all students selected for the survey. Once parental permission was obtained, the youth groups were given the survey questionnaires.

Instrumentation

The main questionnaire utilized was the Adolescent Psychopathology Scale-Short Form (Reynolds, 2000), referred to as the APS-SF. The APS-SF is a short, but reliable measure of cross section of psychopathology and problems pertaining to adolescent adjustment. The APS-SF measures six specific *DSM-IV* disorders and six additional psychological and behavioral problems relevant to the clinical evaluation of adolescents. The scales are designed to sample representative *DSM-IV* symptoms associated with Conduct Disorder, Oppositional Defiant Disorder, Major Depression, Generalized Anxiety Disorder, Post Traumatic Stress Disorder, and Substance Abuse Disorder. The remaining six clinical scales evaluate significant domains of adolescent psychosocial problems. These scales include Eating Disorder, Suicide Ideation, Academic Problems, Anger/Violence Proneness, Self Concept, and Interpersonal Problems. Two validity scales look at aspects of response validity. The APS-SF has 115 items. Some questions

uses true/false formats while others are evaluated using a frequency or duration format and some questions are evaluated across various duration intervals.

The APS-SF has two validity indicators: The Defensiveness and Consistency Response scales. The defensiveness response scales consist of six items that reflect a highly unlikely or overly positive action or response. This scale measures the respondent's willingness to give honest answers. The Consistency Response scale consists of 14 pairs that contain opposite content in order to indicate inconsistent responding. There are 26 items of the 115 that are designated as critical items. The critical items are drawn from the following scales: Conduct Disorders, Substance Abuse Disorder, Posttraumatic Stress Disorder, Major Depression, Eating Disorder, Anger/Violence Proneness, Academic Problems, Suicide Ideation, and Interpersonal Problems (Reynolds, 2000).

Reliability of a test refers to the consistency of measurement provided by the test. The APS-SF internal consistency reliability (as reported by Reynolds, 2000) was measured utilizing Cronbach's coefficient alpha. The internal consistency reliability coefficients for males were moderately high for most clinical scales. The median item with total scale correlation was .84, with a range of .74-.89. The internal consistency coefficients for females were moderately high for the clinical scales. The internal consistency coefficients for all but the Conduct Disorder scale were .82 or higher. The test- retest reliability of the APS-SF ranged from a medium item with total scale correlation ranging from .76 to .91 (Reynolds, 2000).

Validity is also crucial for psychopathology measurement, especially given the types of clinical decisions that may be based on the assessment. Content validity is the degree that the test adequately samples specific behaviors. Content validity depends upon the adequacy of symptom sampling and the ability of the scale items to contribute to the total scale. Measurement of content validity according to Reynolds (2000) is inferred from the item-with-total scale correlations. The APS-SF item-with-total scale correlation coefficients for the twelve clinical scales were generally high with correlations in the .40 to .70 range. These results indicate that most test items demonstrate item-with-total scale correlation coefficient above .40 and provide evidence to support the content validity of the APS-SF as measures of psychopathology in adolescents (Reynolds, 2000).

Reynolds (2000) discussed the importance of criterion-related validity as a test of psychopathology severity. The criterion measure should be reliable and valid and should show a realistic evaluation of the attribute being tested. Reynolds (2000) stated that there are two types of criterion-related validity. Concurrent validity is the characteristic of the APS-SF that is meant to assess current levels of psychopathology. Predictive validity is the association between test performance and future events. High correlations were found between the APS-SF and the complete APS scale. Correlation coefficients of .90 or higher were found on 11 of the 12 clinical scales in three samples conducted by Reynolds (2000). Results of the criterion-related validity of the APS demonstrate significant correlations with the MMPI scales meant to measure similar constructs. Reynolds (2000) stated that overall the validity studies for the APS-SF show strong

empirical support for the use of the APS-SF as a measure of the severity of clinical and psychosocial problems in adolescents. In addition to the APS-SF, a researcher-designed instrument was used to measure the impact of the hurricane on test subjects. This questionnaire is included in Appendix A. The APS-SF may not be included because of copyright.

Data Collection Procedures

Leaders of the two youth groups surveyed were contacted in early 2008. The purpose of the research and how the data would be safeguarded was explained to the two leaders of the respective groups. This student researcher explained that the study had to be approved by the Liberty University Institutional Review Board. Part of the research process was to make sure that no harm was done to subjects, that parental permission was obtained for minors to participate, and that parents were notified of serious or questionable mental health indicators as discovered in the research testing. Formal permission to proceed with the research was obtained from the Liberty University Institutional Review Board in April of 2008. The IRB made several suggestions regarding the format and order of the researcher questionnaire as well as suggestions on how to make sure the parents or guardians received information in cases where APS-SF test scores revealed there may be a need for additional mental health follow-up.

Upon receipt of the IRB approval, this student researcher contacted both group leaders to establish dates for the testing. Rosters of each group were also obtained so numbers could be assigned to the individuals to ensure confidentiality. The intent was to have the students tested before school ended in late May, permitting evaluation of the

testing and notification of parents over the summer, as students might move or go to college. The first test subjects were members of a local church youth group. The youth pastor had explained to the church body in mid-April of 2008 the purpose of the study and that this student researcher was asking for voluntary permission for youth in grades 7-12 to participate during two Sundays. The youth pastor indicated that parent permission slips along with information about the study was given to all students in grades 7-12 in Sunday School that day. Parents were encouraged to contact the student researcher if they had any questions. Testing was done in two groups at the church. The first group was members of the senior class who took the test in late April 2008. Following verbal instructions and collection of permission forms for those under 18 by this researcher, this group of 10 students served to pretest the researcher-designed questionnaire. One small correction was made after discovering a duplicate question that did not impact the outcome. These seniors clearly understood the tests and indicated they did not believe younger students would have a problem understanding or taking the test.

The following Sunday, the other group of youth in grades 7-11 were tested during the Sunday School hour after permission forms were collected and detailed instructions given by the researcher. Adult teachers helped collect the permission forms and monitor the group during the testing. Confidentiality was maintained as numbers were assigned to the respondents. Adults helping to monitor the students did not have access to the numbers.

The same Sunday night in late April that the second group was tested at the church, this researcher met with the members of the youth organization PRIDE (Parent

Resources in Drug Education). The purpose of the research was explained and student participation was solicited for the following Tuesday after the youth performed at a local school. Leaders of the youth group helped gather the parental permission forms and monitor the groups during the process. Once again, confidentiality was maintained as numbers were assigned to the participants. Adults helping to monitor the students did not have access to the numbers. The PRIDE group was then tested and the surveys filled out. A total of 126 questionnaires were received from both groups.

Reynolds (2000) recommended administering the APS-SF between 10:00 am and 2:00 pm due to adolescents reporting greater sleepiness in the early morning and late afternoon. Group one was tested at 9:30 after receiving some snacks and juice. Group two was tested at 12 noon after a brief lunch break. Reynolds (2000) suggested introducing the test as a “mental health questionnaire” designed to assess recent behaviors and feelings and this protocol was utilized. The researcher-designed questionnaire was given after the APS-SF was completed. Detailed instructions were given to the students who were also told they must answer all questions on the questionnaire.

The APS-SF forms were scored using a computerized scoring program and key (Reynolds, 2000). The scoring program allows the user to select the normative comparison groups for a particular protocol. Based on this protocol, the program calculated T scores for each scale and generated a clinical score report containing client information, profile of the clinical tables, critical item summary, and item response summary table. Reynolds cautioned that interpretation of the APS-SF should be

evaluated within the context of all information available including clinical observations and the observations of others, as some adolescents may be defensive and some may over-endorse certain test items in attempts to look bad (Reynolds, 2000).

Raw scores for all APS-SF scales were converted to standard scores to create a T score. There are five levels of scores that link the T score to the normative mean of clinical level. T scores of 60 and below are in the normal range. T scores from 60-64 are in the sub-clinical symptom range. T scores from 65-69 are in the mid-clinical symptoms range. T scores from 70-79 are in the moderate clinical symptom range. T scores of 80 and above are in the severe clinical symptom range (Reynolds, 2000).

Parents of adolescents who scored a moderate to severe T score on the critical items summary in the areas of Generalized Anxiety Disorder, Post Traumatic Stress Disorder, Major Depression, Eating Disorder, Suicidal Ideation and Self-Concept were contacted and provided the opportunity to meet with the researcher for recommendations on follow-up counseling. Ten parents were contacted via phone with the results of the surveys whose adolescents scored in the moderate to severe range in these areas. Two parents asked for and were provided copies of the summary report of the APS-SF. Parents who called were given the opportunity to meet with the researcher, but none took advantage of the offer. Some parents welcomed the information as confirmation of what they were seeing, others seemed unconcerned. Parents who were called were encouraged to follow up with a mental health provider for their child. One parent expressed concern about the data on her daughter and the parent was assured that her daughter's confidentiality would be maintained. This parent was assured that no one would know

the name of her daughter and only results that could not be identified except by the researcher would be utilized in this study. APS-SF test results and the results of the researcher-designed questionnaire were entered into SPSS for analysis. The SPSS results were examined by a statistician at the University of Southern Mississippi who was paid for his professional statistics services.

Data Processing and Analysis

Cross tabulations of data were used to determine the relationship between evacuation and mental health impact. The statistical analysis of the data was conducted using Multivariate Analysis of Variance (MANOVA) and One Way Analysis of Variance (ANOVA), Pearson's *r* Correlation and Frequency Analysis. The following hypothesis was used to answer the first research question:

(a) Null hypothesis= no difference in the means of the independent variables (students evacuated for Hurricane Katrina) over the means of the dependent variable (students meet the minimum clinical symptom T score for one or more of the following: Generalized Anxiety Disorder, Post Traumatic Stress Disorder, Major Depression, Eating Disorder, Suicidal Ideation and Self-Concept as measured by the APS-SF. That is, students were not psychologically impacted or traumatized as a result of evacuating and relocating for Hurricane Katrina. Level of significance was set at $p < .05$.

(b). Research hypotheses= A difference exists in the means of the independent variables (students evacuated for Hurricane Katrina) over the means of the dependent variable (students meet minimum clinical symptoms T score on one or more of the following: Generalized Anxiety Disorder, Post Traumatic Stress Disorder, Major

Depression, Eating Disorder, Suicidal Ideation, and Self-Concept) as measured by the APS-SF. That is, students were psychologically impacted or traumatized as a result of evacuating and relocating for Hurricane Katrina. The level of significance was set at $p < .05$.

Cross tabulation of three defined evacuation groups (no impact, evacuated for less than 30 days, and evacuated for over 30 days) and frequency analysis of the students' class grades, income, and sex were conducted. One-way analysis of variance (ANOVA) was used to test the means for the mental illness groups flagged for the study based on the APS-SF. These mental illness groups were Generalized Anxiety Disorder, Post Traumatic Stress Disorder, Major Depression, Eating Disorder, Suicidal Ideation and Self-Concept. ANOVA, Pearson's Correlation and t-tests were used to analyze differences in mental illness scores based on the type of impact suffered as a result of the hurricane, as well as the type of support received. Cross tabulations of data within and among groups were performed and chi-square test and Pearson correlations provided correlation information.

Chapter Summary

The purpose of this study was to gain an understanding of how adolescents psychologically adjusted and adapted to adversity in their lives after Hurricane Katrina. The study utilized the Adolescent Psychology Scale-Short Form (Reynolds, 2000) and a researcher designed questionnaire that was administered to 126 high school civics in one civic and one church group in Southeast Louisiana. The APS-SF provided T scores for six areas (Generalized Anxiety Disorder, Post Traumatic Stress Disorder, Major

Depression, Eating Disorder, Suicide Ideation, and Self-Concept) to ascertain adolescent mental health. The APS-SF forms were graded using a computerized scoring program and key (Reynolds, 2000). Parents of minors were notified when the scores on the APS-SF were in the moderate or severe range (T scores equal to or greater than 70) in any of the mental health assessment areas. The researcher-designed questionnaire was also administered to ascertain the coping skills utilized by the adolescents after the storm. The study was approved by Liberty University's IRB and parent or guardian permission was obtained prior to testing for minors. Two separate groups were tested on three different occasions utilizing testing protocol outlined by Reynolds (2000). Confidentiality was maintained by obtaining a list of those testing from the group leaders and assigning numbers to students tested. The data was analyzed statistically to determine the relationship between evacuation, impact, and mental health issues.

CHAPTER FOUR: FINDINGS

This study examined adolescents' psychological adjustment and adaptation in Southeast Louisiana following Hurricane Katrina. The world that teenagers knew before Katrina had changed, and the way in which adolescents were impacted is the focus of this study. Previously cited research (Carr, 2004; Gaffney, 2006; Jones, Frary, Cunningham, Weddle, & Kaiser, 2001; McDermott & Palmer, 2002) reported that adolescent trauma impact varies according to the individual's support systems that include family, friends, and significant other adults. The grief and loss experienced by adolescents after a disaster can lead to feelings of hopelessness, depression and Post Traumatic Stress Disorder. The deficit of vital research information regarding adolescent resilience following a major natural catastrophe warrants a study of this nature. Information on how adolescents remain resilient and adapt following a major life-altering event may help clinicians and adults who work with this age group better respond to their needs after a major catastrophic event such as a hurricane.

The Adolescent Psychopathology Scale-Short Form (APS-SF) developed by Reynolds (2000) and a researcher-designed survey measuring impact of Katrina was administered to 126 high school students in one civic and one church group in Southeast Louisiana to obtain the primary data for this dissertation. Ages of participants ranged from 12 to 19. The sample was composed of 9 seventh graders, 11 eighth graders, 30 ninth graders, 35 tenth graders, 13 eleventh graders, and 28 twelfth graders. Percentage-wise the majority of the students were in the ninth (23.8%), tenth (27.8%) and 12th grades (22.2%). Most of the sample were Caucasian students with only 4 (3.17%)

reporting African-American or Hispanic-American ethnicity. Table 1 shows the breakdown of students by grades within the three impact groups: no impact (no evacuation), evacuation for less than 30 days, and evacuation for over 30 days.

Table 1
Distribution of grades within impact groups

Grade	No Impact		Less than 30 days		Over 30 days	
	n	%	n	%	n	%
7	1	7.1	4	6.0	4	8.9
8	2	14.3	7	10.4	2	4.4
9	3	21.4	18	26.9	9	20.0
10	4	28.6	16	23.9	15	33.3
11	2	14.3	4	6.0	7	15.6
12	2	14.3	18	26.9	8	17.8
Total	14	100	67	100	45	100

Forty-eight males and seventy-eight females completed the instruments.

Percentage-wise, 61.9% of the sample was female and 38.1% were male. Most of the students, male or female, were in the group that evacuated for less than 30 days. Table 2 shows the breakdown of the groups by sex.

Table 2
Distribution of sex within impact groups

	No impact		Less than 30 days		More than 30 days	
	n	%	n	%	n	%
Sex						
Male	5	35.7	29	43.3	14	31.1
Female	9	64.3	38	56.7	31	68.9
Total	14	100	67	100	45	100

The largest income group was the >100 \$K group (23%). The second largest group was the 60-80\$K group (21.4%). A breakdown by evacuation groups, as shown in Table 3, indicated that income was not a determining factor in the evacuation process.

Table 3
Distribution of income within impact groups

Income	No impact		Less than 30 days		Over 30 days	
	n	%	n	%	n	%
0-20K	0	0	1	1.5	1	2.2
21-40K	1	7.1	6	9.0	3	6.7
40-60K	4	28.6	11	16.4	8	17.8
60-80K	2	14.3	15	22.4	10	22.2
80-100K	2	14.3	11	16.4	3	6.7
>100K	4	28.6	16	23.9	9	20.0
Unknown	1	7.1	7	10.4	11	24.4
Total	14	100	67	100	45	100

Impact of Evacuation and Relocation

The first research question guiding this study explored the extent to which short and long term evacuation and relocation after Hurricane Katrina affected psychological adjustment and adaptation among youth in Southeast Louisiana. The data indicated that students who returned within 30 days had more difficulty coping and adapting when compared to the other two groups: those who did not evacuate and those who evacuated for over 30 days. Six variables were utilized from the APS-SF to ascertain the mental health of the adolescents tested. These variables were Generalized Anxiety Disorder (GAD), Post Traumatic Stress Disorder (PTSD), Major Depression (MD), Eating Disorder (ED), Suicide Ideation (S), and Self-Concept (SC). The means and standard deviations of students in the less than 30 day evacuation group were higher than the means of the no impact or over 30 day evacuation groups. Table 4 provides the breakdown of means and standard deviations for all three groups.

Means for mental health factors among students who were not evacuated and those who were gone for more than 30 days were lower than among those who evacuated for less than 30 days. Time out of the area before re-exposure to the devastation appears to be a factor in determining psychological impact on the adolescents from the standpoint of means. This concept would make sense as the idea of not knowing how bad the devastation actually was in the area could create anxiety. The group that did not evacuate knew fairly quickly how bad the damage was to the area and surrounding homes. The group that was gone for over 30 days came back to a devastated area that had been partially cleaned up from the initial storm impact. However, the MANOVA was not

significant [F (12,238) = .564, p=.869]. Separate univariate ANOVAs were as follows: GAD: [F (2,123) = .890, $p = .413$]; PTSD: [F (2,123) = 1.447, $p = .239$]; MD: [F (2,123) = 1.655, $p = .195$]; ED: [F (2,123) = 2.410, $p = .094$]; S: [F (2,123) = 1.632, $p = .200$]; SC: [F (2,123) = .923, $p = .400$]. All scales tested separately were thus non-significant. Combining the groups that evacuated and relocated for more or less than 30 days did not generate significantly higher means when compared to the group that did not evacuate. The hypothesis was thus not supported.

Table 4
Distribution of means and standard deviation within impact groups of T scores of mental health variables

MH Variable	No Impact		Less than 30 days		Over 30 days	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
GAD	48.36	9.11	50.75	9.73	48.56	9.40
PTSD	46.00	8.25	48.83	8.97	46.40	7.38
MD	45.71	7.87	48.65	8.975	46.20	6.18
ED	46.71	6.15	49.89	9.93	46.46	6.90
S	44.78	2.66	46.29	5.44	44.93	2.52
SC	46.07	7.52	47.14	9.31	45.04	5.89

Note: Generalized Anxiety Disorder (GAD), Post Traumatic Stress Disorder (PTSD), Major Depression (MD), Eating Disorder (ED), Suicide Ideation (S), Self Concept- (SC)

The APS-SF T scores indicate the amount of clinical impairment in a particular area. T scores below 60 are in the normal range. T scores from 60-64 are in the

subclinical range. T scores from 65-69 are in the mild clinical symptom range. T scores from 70-79 are in the moderate clinical range. T scores of 80 and above indicate a severe clinical range (Reynolds, 2000).

Review of the cross tabulation data indicated that 24 individuals (19.0%) of students in all three groups met the minimum clinical criteria for Generalized Anxiety Disorder. Fifteen students (62.5%) of those who met the minimum criteria for Generalized Anxiety Disorder were in the group that came back within thirty days of evacuation. Thirteen students (10.3%) met or exceeded the minimum clinical T scores for Post Traumatic Stress Disorder. Nine students (69.2%) meeting the minimum clinical scores for PTSD were in the group that evacuated for less than 30 days. Thirteen students (10.3%) also met or exceeded the minimum clinical T scores for Major Depression. Eight (61.5%) of individuals meeting the minimum clinical scores for Major Depression were in the group that were evacuated for less than 30 days. Eleven students (8.7%) met or exceeded the minimum clinical T scores for Eating Disorder. Nine (81.8%) individuals meeting the minimum clinical scores for Eating Disorder were in the group that evacuated for less than 30 days. Three students (1.5%) met or exceeded the minimum clinical T scores for Suicide Ideation. Three (100%) of individuals meeting the minimum clinical scores for Suicide Ideation were in the group that evacuated for less than 30 days. Finally, six students (4.7%) met or exceeded the minimum clinical T scores for Self-Concept. Six (100%) students meeting the minimum clinical scores for Self-Concept issues were in the group that evacuated for less than 30 days. Table 5 lists the breakdown of this data by evacuation groups into the clinical ranges.

Table 5
*Clinical range divisions by mental health area divided into evacuation group
representing clinical attainment of mental health score as per the APS-SF*

Variable	Clinical range	No Impact <i>n</i>	Less than 30 days <i>n</i>	Over 30 days <i>n</i>	Total
GAD	Sub	1	12	3	16
	Mild	1	3	2	6
	Moderate	0	1	1	2
	Severe	0	0	0	0
PTSD	Sub	0	4	2	6
	Mild	1	3	1	5
	Moderate	0	2	0	2
	Severe	0	0	0	0
MD	Sub	1	4	1	6
	Mild	0	2	0	2
	Moderate	0	2	0	1
ED	Sub	1	2	0	3
	Mild	0	1	0	1
	Moderate	0	5	1	6
	Severe	0	1	0	1
SI	Sub	0	1	0	1
	Mild	0	1	0	1
	Moderate	0	1	0	1
	Severe	0	0	0	0
SC	Sub	0	1	1	2
	Mild	0	2	2	4
	Moderate	0	2	0	2
	Severe	0	0	0	0

Note: Generalized Anxiety Disorder (GAD), Post Traumatic Stress Disorder (PTSD), Major Depression (MD), Eating Disorder (ED), Suicide Ideation (S), Self Concept (SC)
Note: T scores 60-64, subclinical range; 65-69 mild clinical symptom range; 70-79 moderate clinical range; 80 and above severe clinical range.

Norms for the APS-SF were developed from a total sample of 1,827 students (Reynolds, 2000). These students were 12-19 years old and consisted of 900 males and 927 females. The means and standard deviations of Generalized Anxiety Disorder (GAD) and Eating Disorder (ED) students in the sample fall within the range of the APS-SF norms. Means and standard deviations for Post Traumatic Stress Disorder (PTSD), Major Depression (MD), Suicide Ideation (S) and Self- Concept (SC) in this research are lower than the APS-SF norms. Table 6 provides a breakdown of the distribution of means and standard deviation and T scores within standardization between males and females for the six mental health variables measured.

Table 6
Distribution of means and standard deviation and range of T- scores within standardization between males and females for six mental health variables.

<i>MH Variable</i>	Males			Females		
	<i>M</i>	<i>SD</i>	<i>Range of T</i>	<i>M</i>	<i>SD</i>	<i>Range of T</i>
GAD	47.43	9.02	36-66	52.51	10.27	36-71
PTSD	47.37	8.93	37-70	52.53	10.32	37-70
MD	47.18	8.62	34-74	52.75	10.48	34-72
ED	45.67	6.32	40-77	54.17	11.07	40-80
S	48.67	8.79	42-70	51.30	10.90	42-66
SC	48.95	9.46	36-76	51.01	10.40	36-70

Note: Generalized Anxiety Disorder (GAD), Post Traumatic Stress Disorder (PTSD), Major Depression (MD), Eating Disorder (ED), Suicide Ideation (S), Self Concept (SC).

This research question attempted to identify factors that influenced adolescent resilience. The length of time the individual was outside of the parish was previously discussed. Students that returned within 30 days reported having more difficulty adjusting and adapting. Separation from parents or guardians may be relevant to how well adolescents coped with the trauma of the storm, although there is no statistical correlation for this finding other than the higher numbers of students separated in the less than 30 days and over 30 days evacuation groups. Fifty-two students (41%) reported being separated from their parents or guardians after Hurricane Katrina. Table 7 illustrates cross-tabulations of data for students separated from parents or guardians.

Table 7
Cross tabulation of separation from parents or guardians within evacuation groups

Group	No Impact		Less than 30 days		Over 30 days	
Separated	Count	%	Count	%	Count	%
Yes	2	14.3	28	41.8	22	48.9
No	12	85.7	39	58.2	23	51.1

Cross-tabulations of data on what or who helped the most after the hurricane revealed that in the no impact group, friends helped more than parents (50% friends compared to 21.4% parents). The group that evacuated for less than 30 days reported that parents and friends helped the same amount (37.3%). Those who evacuated for over 30 days reported that parents helped more than friends (35.7% parents compared to 11.1% friends). The data indicates that for the group who stayed, friends played a bigger role in

coping than parents, while the group who evacuated for over 30 days relied more on their parents to help them cope. It is interesting to note that very few students (less than 1%) received help from significant others such as relatives or other adults. The analysis indicated that there were no significant differences in the psychological disorders among the students depending on whom they received the most help from or on the level of help received. Table 8 illustrates the numbers of individuals who helped by evacuation group.

The researcher-designed questionnaire showed that students used other methods to cope including faith, prayer and sports. Correlation analyses of these questions to each of the mental health variables indicate, however, that coping was not significantly correlated with any APS-SF variables.

Examination of frequencies revealed that five students (4%) reported they are still coping with the storm. Twenty-eight students (22.6%) reported that they still feel anxious thinking of storms or other hurricanes. Thirty-two students (25.8%) reported feeling as if their lives will never be the same since Hurricane Katrina.

Impact and Increased Psychological Disorders

The second research question guiding this study addressed what effect Hurricane Katrina had on the youth of Southeast Louisiana and to what extent these traumatic experiences led to increased psychological disorders among impacted adolescents. Impact of Hurricane Katrina was measured through questions on the researcher-designed questionnaire, such as damage to the home from the hurricane, alternate living arrangements, changes in schools, friends, grades, parents job situations, feeling scared during the storm, feeling as if their lives have changed forever, and experiencing

flashbacks and nightmares as a result of the storm. The most common type of impact was feeling scared because of the hurricane, followed by having to live in another house, their own house being damaged, losing old friends, and feeling like their lives will never be the same.

Table 8
Distribution of cross tabulation data indicating who helped students cope with Hurricane Katrina

	No Impact	Less than 30 days	Over 30 days
Who Helped Most	<i>n</i>	<i>n</i>	<i>n</i>
Parents	3	25	17
Friends	7	25	5
Relatives	0	4	9
Others	0	2	1
All	1	0	1
Parents & Friends	1	2	4
Friends & Relatives	0	1	1
Parents & Relatives	1	4	1
Parents & Friends & Relatives	0	2	4
No one	1	1	2

Scores for each respondent were calculated based on the scope of the impact, i.e. how many ways the students were impacted as measured on the researcher-designed

questionnaire. T scores from the APS-SF were then correlated with the impact reported. The results, which are displayed in Table 9 below, indicated that the scope of the impact was significantly correlated with each of the major variables measured by the APS- SF. Most correlations were significant at the .01 level of significance and one correlation (Self-Concept) was at the .05 level of significance. The correlations would be considered weak to moderate, as they accounted for 5-16% of the variance.

One of the most common forms of impact was separation from parents or guardians, which fifty-two of the 126 students (41.3%) reported.

Table 9
Pearson Correlations for each of the mental health variables and impact

MH Variable	Pearson Correlations (2 tailed)
GAD	.325(**)
PTSD	.401 (**)
MD	.369 (**)
ED	.275 (**)
S	.303 (**)
SC	.228 (*)

** Significant at the .01 level (2-tailed)

*Significant at the 0.05 level (2 tailed)

Note: Generalized Anxiety Disorder (GAD), Post Traumatic Stress Disorder (PTSD), Major Depression (MD), Eating Disorder (ED), Suicide Ideation (S), Self Concept (SC)

Table 10 shows that the means and standard deviations for the scope of impact among the students evacuated for less than 30 days appear higher than those who did not

evacuate or those who were gone for over 30 days. This is consistent with the data in Table 4 that showed that the means for the mental health factors were higher for the less than 30 day evacuation group than the no impact or evacuation for over 30 days groups. Table 10 outlines the means and standard deviations of impact by evacuation group.

Table 10
Mean and standard deviation of level of impact by group

Impact group	M	SD
No impact	1.42	1.98
Less than 30 days	3.25	2.78
Over 30 days	3.04	2.41

Adolescents suffered various types of emotional and physical impact other than evacuation and relocation during Hurricane Katrina. Frequency analysis of data showed that 60.3% percent of students experienced damage to their homes. Thirty-six percent of students felt scared and 22.6 % indicated they were still afraid of storms. Many (41.3%) were separated from their parents or guardians during the storm. Twenty-seven percent of students reported losing old friends. Students reported that they saw someone get hurt or die (10.3%) and that they had a relative or family member die as a result of the storm (8.7 %). Students reported losing a pet (8.7%) and 7.3% state they are still experiencing nightmares or flashbacks about the storm. Many students (25.8%) reported they believe their lives will never be the same as they were before Katrina.

There was a significant difference between the observed and expected frequency of students who felt scared after the storm [$X^2(2) = 9.866, p=.007$], are anxious about storms [$X^2(2) = 8.872, p=.012$], and those experiencing flashbacks [$X^2(2) = 5.984, p=.050$]. The APS-SF scores for Generalized Anxiety Disorder, PTSD, Major Depression, and Eating Disorder were higher among those who reported that they felt scared during the storm. The mean scores for GAD were 53.4 and 47.6, respectively [$t(82)=3.33, p=.001$]. The mean scores for PTSD were 51.3 and 45.6 [$t(124)=3.84, p<.001$]. The mean scores for MD were 51.3 and 45.3 [$t(124)=4.28, p<.001$]. Finally the mean score for ED among those who felt scared was 51.7 compared to 46.4 [$t(124)=3.37, p=.001$].

There were also significant differences in the levels of PTSD and Suicide Ideation among those who reported having lost contact with old friends as a result of the storm. The mean scores for PTSD were 51.2 and 46.3 respectively [$t(124)=3.00, p=.003$]. The mean scores for SI were 47.5 and 44.9 ($t(124)=2.99, p=.003$). There were no significant differences in the levels of psychological disorders among those who reported damage to their home, among those who saw someone get hurt or die, those who lost a pet, whose parents got divorced, who had to move, or who had to change schools.

Chapter Summary

The statistical tests revealed no significant differences in levels of psychological disorders among the group that stayed behind, the group that evacuated for less than 30 days, and the group that evacuated for more than 30 days, or between the group that stayed and the group that evacuated, when the two evacuation groups were combined.

The data indicated that of the mental health issues evaluated for this study (Generalized Anxiety Disorder, Post Traumatic Stress Disorder, Major Depression, Eating Disorder, Suicide Ideation, and Self-Concept), the majority of individuals scoring clinically significant T scores (over 60) were in the group that evacuated for less than 30 days. However, this was also the largest group representing 53% of the sample. Twenty-four (19%) of students had T scores of 60 and above in the area of Generalized Anxiety Disorder. Thirteen students (10.3%) had T scores of 60 and above in the area of Post Traumatic Stress Disorder. Thirteen students (7.9%) had scores of 60 and above in the area of Major Depression. Eleven students (8.7%) met or exceeded the minimal T scores for Eating Disorder. Three students (1.5%) met or exceed the minimum clinical T scores for Suicide Ideation. Six students (4.7%) met or exceeded the minimum clinical T scores for Self-Concept. The means and standard deviations among the sample were within or below the range of APS-SF norms.

Students relied on a variety of methods to cope. Most talked to their parents or friends. Many utilized their faith (61.1%) and some played sports (45.2%). The methods for coping were not significantly correlated with the major items measured on the APS-SF. The results show that the students continue to be impacted by Hurricane Katrina.

Sixty percent of students experienced damage to their homes, 41.3% were separated from their parents or guardians during the storm, 27% reported losing old friends, 25.8% reported their lives would never be the same after the storm, 22.6% indicated they were still afraid of storms, 10.3% saw someone die during the storm,

8.7 % reported that they had family members die as a result of the storm, 8.7 % reported losing a pet and 7.3% state they are still experiencing nightmares or flashbacks about the storm.

There was a statistically significant correlation between the scope of impact and the T scores measuring psychological disorders. Impact was significantly correlated with all but one mental health variable at the .01 level of significance. Generalized Anxiety Disorder was correlated at .325, Post Traumatic Stress Disorder at .401, Major Depression at .369, Eating Disorder at .275, and Suicide Ideation at .303. The variable Self-Concept was correlated at .228 level with a .05 level of significance.

The results also revealed higher levels of PTSD and Suicide Ideation among those who were separated from their friends and higher levels of GAD, PTSD, Depression, and Eating Disorder among those who experienced high levels of fear during the storm.

CHAPTER FIVE: DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Adolescents exposed to traumatic events such as hurricanes may experience long-term behavioral and emotional changes (Swenson et al., 1996). The severity of the symptoms depend on parental response, the resiliency of the individual, and the relationship of friends and school (Math et al., 2006). Natural disasters can impact adolescents' psychological functioning, especially if there is high exposure to the incident and post-disaster recovery is difficult. Substantial numbers of adolescents and children who are victims may experience moderate to severe psychological stress years after the disaster (La Greca et al., 2002). Research on family coping styles after Hurricane Katrina indicated that adolescents exposed to and displaced by the storm reported lower self-esteem and higher internalization of symptoms as well as symptoms of distress (Vigal & Geary, 2008). Adolescent adjustment and adaptation measures in Southeast Louisiana following Hurricane Katrina had not previously been determined. Understanding how adolescents adapt and adjust to the psychological distress that occurs after a natural disaster is crucial to preventing further psychological health problems and preparing counselors to help adolescents after such an event (Russoniello et al., 2002).

The available literature on disasters and their impact on children and adolescents indicated that this population reacts to trauma in a similar manner to adults (Field et al., 1996; Shaw et al., 1996; Warheit et al., 1996). Some studies (Cohen et al., 1996; La Greca et al., 2002; Kirk & Madden, 2003) revealed that a large proportion of children and adolescents experience serious psychological distress after major natural disasters such as hurricanes. Depending on the severity of the disaster, moderate to severe levels

of PTSD symptoms have been found to develop among 30% to 60 % of the adolescents impacted (Hardin, 2002; Kirk & Madden, 2003).

La Greca et al. (2002) reported that children's psychological difficulties such as anxiety, behavioral problems, and inattention increase following a natural disaster. Children and adolescents may also display anxiety, disaster-related fears and depression. This is consistent with other research (Baggerly & Exum, 2009, Field et al., 1996; Flynn & Nelson, 1998) reporting that after natural disasters pre-adolescents and adolescents may exhibit symptoms such as withdrawal, isolation, numbing, depression, sadness, refusal to do chores, antisocial behavior, decreased school performance, sleep disturbance, loss of interest in hobbies, increasing risk taking behavior, conduct problems and substance abuse.

Adolescents' reactions to trauma from a natural disaster are a function of many variables. The length and extent of exposure is paramount. Flooding or destruction of the house, forced evacuation, and length of evacuation also play roles in the reaction to trauma (Osofsky et al., 2009). Najarian, L., Goenjian, Pelcovitz, Mande, and Najarian, B. (2001) studied 25 women who evacuated after an earthquake and 24 in a comparison group who did not and reported that the incidences of PTSD were no different between the groups. Their overall findings were consistent with previous studies that found a high risk for PTSD and depression in relocated adults. Wheeler (2006) discussed how uprooting children to move in cases of job relocation and divorce is more tolerable for emotionally healthy children. Children who lost their home or moved to a new community due to Hurricane Katrina are more susceptible to additional stressors due to

the trauma of relocating and experiencing a loss of safety and security (Wheeler, 2006). Kilmer and Gil-Rivas (2008) discussed the need to reestablish as quickly as possible a sense of safety, structure, and normalcy after a natural disaster.

The first research question guiding this study explored whether short or long term evacuation and relocation after Hurricane Katrina led to increased psychological disorders among youth in Southeast Louisiana. This study utilized the Adolescent Psychological Scale-Short Form (APS-SF) to measure the psychological impact of trauma on 126 adolescents who were divided into one of three test groups based on whether or not they were evacuated during Hurricane Katrina. The first group consisted of subjects who were not evacuated, while the second and third groups were evacuated for less than 30 days and over 30 days, respectively. The results indicated that of the subjects tested three years after Katrina, 24 (19%) met the clinical criteria for Generalized Anxiety Disorder, 13 (10.3%) for PTSD, 9 (7.1%) for Major Depression, and 11 (8.7%) for Eating Disorder. While the findings indicate that many adolescents met the clinical cut-off scores for the mental health issues evaluated on the APS-SF, the scores were at normal or below normal levels. This finding indicates that while the youth who took this survey are still being impacted, the impact is less than those who previously normed the APS-SF. One possible explanation of this is that substantial proportions of post-traumatic mental illness resolves normally within 1-2 years as reported by Kessler, Galea, Sampson, Urano and Wessly (2008).

The results showed that of the mental health issues evaluated for this study, the majority of individuals scoring clinically significant T scores (over 60) were in the group

that evacuated for less than 30 days. T scores of 60 and above were noted in 24 students total (19%) for Generalized Anxiety Disorder. Sixty-seven percent of individuals meeting the minimum clinical scores for GAD were in the group that evacuated for less than 30 days. Thirteen students total (10.3%) met or exceeded the minimum clinical T scores for Post Traumatic Stress Disorder. Sixty-nine percent of individuals meeting the minimum clinical scores for PTSD were in the group that came back after being evacuated less than 30 days. Nine students total (7.1%) met or exceeded the minimum clinical T scores for Major Depression. Eighty-nine percent of individuals meeting the minimum clinical scores for Major Depression were in the group that came back after being evacuated for less than 30 days. Eleven students total (8.7%) met or exceeded the minimum clinical T scores for Eating Disorder. Eighty-two percent of individuals meeting the minimum clinical scores for Eating Disorder were in the group that came back after being evacuated for less than thirty days. These results parallel those of previous studies on PTSD and mental health issues following a major disaster. Garrison, Bryant, Addy, Spurrier, & Kilpatrick (1995) reported five to ten percent of adolescents meeting PTSD criteria after a major disaster. Norris, Friedman, and Watson (as reported in Foa, Stein, & McFarlane, 2006) reviewed 160 studies of disaster victims and reported that 77% of the studies indicated that specific psychological disorders such as PTSD were present. Their report indicated that PTSD was observed in 68% of the studies, followed by depression in 36%, and anxiety in 20%. The results also confirm research by Osofsky et al. (2009) showing that exposure to traumatic events, such as damage to home and moving away from friends, contributes to PTSD symptoms. The overall rates of anxiety

(19%), PTSD (10.7) and major depression (8.7%) reflect findings in the literature (Costa, Weems, & Pina, 2009; Vigel & Geary, 2008; Rowe & Liddle, 2008) that trauma experienced by survivors of Hurricane Katrina will be serious and long lasting.

It was hypothesized that there would be differences in the means of the mental health factors for the different groups tested. The results of the data analysis showed there were differences in the means of the three groups; specifically, the group that came back to the Parish within 30 days had a higher mean. However, the differences were not significant in the means of the independent variable (students evacuated for Hurricane Katrina) over the means of the dependent variable (students meet minimum clinical symptoms scores for Generalized Anxiety Disorder, PTSD, Major Depression, Eating Disorder, Suicide Ideation, and Self-Concept). The null hypothesis was therefore accepted and the research hypothesis was rejected. The small sample size of 126 students may explain why differences in the means of mental health scores as measured by the APS-SF were not statistically significant. A larger sample size would possibly provide statistically different variation in scores.

While there is no previous known research that evaluates differences in three evacuation groups after a natural disaster, the results reflect some findings of a study by Dass-Brailsford (2008) who reported that survivors of a natural disaster who remained in familiar surroundings were able to maintain family cohesion and preserve psychological community while contributing to recovery and reconstruction efforts. Those who relocated to distant areas experienced a loss of connections and a weakening of community ties (Dass-Brailsford, 2008).

The impact from Hurricane Katrina included damage to the home, alternate living arrangements, changes in schools, loss of friends, grades, changes in parents' job situations, feeling scared during the storm, feeling as if their lives have changed forever, and experiencing flashbacks and nightmares as a result of the storm. The most common impact was damage to the home, followed by separation from family and friends, followed by loss of friends. The results confirm research by Osofsky et al. (2009) showing that exposure to traumatic events, such as damage to home and moving away from friends, contributes to PTSD symptoms. The results of the study showing that 19% of students meet the criteria for anxiety disorders reflect findings in the literature (Costa, Weems, & Pina, 2009; Vigel & Geary, 2008; Rowe & Liddle, 2008) that trauma experienced by survivors of Hurricane Katrina will be serious and long lasting and will require mental health monitoring for years to come. The time that students spent away from the area appeared to be a stronger factor in mental health variables than relocation, especially in the less than 30 day group. The means for the mental health factors in all groups for the less than 30 day evacuation group were higher than the no impact or evacuation over thirty days group.

The data regarding the increased mental health issues of the group that evacuated for less than 30 days is difficult to explain, but is consistent with research reported by Najarian et al. (2001) reporting that both those who evacuated after an earthquake and those who stayed experienced similar symptoms of depression and PTSD. Students who stayed or whose parents did not see the need to evacuate were immediately forced into dealing with the trauma of the situation. These actions are consistent with the first and

second phases of traumatic impact and immediate post-disaster responses according to the National Center for Post Traumatic Stress Disorder (Kanel, 2007). Students who evacuated with their parents and returned within 30 days faced uncertainties such as not knowing in many cases if their house was damaged or destroyed. Research by Dass-Bailford (2008) supports the findings that those individuals who evacuated have more mental health issues since they tended to lose their sense of community upon evacuation and typically did not participate in reconstruction efforts immediately in the community. Another possible explanation is that since the survey was taken three years after the storm, the type of groups (church and youth) that the sample was taken from may have provided social support that helped the youth to adjust and adapt.

Upon return, these families had to cope with infrastructure devastation that could not adequately be described by news broadcasts as well as the rebuilding process. Many locations in St. Tammany Parish were without power for weeks making living conditions difficult at best. Phone communications were spotty due to the destruction of main phone lines and cell towers. Schools were closed for over 30 days after the hurricane, so the opportunity to reconnect with friends was minimal. Additionally, many parents waited to see if their places of employment were intact and whether they faced possible job loss. These uncertainties were aggravated by the everyday stressors of buying fresh groceries and gas, living without most utilities, and depending on the National Guard, churches, and the Red Cross for food and shelter in many cases. Students and families found themselves in the recovery and rescue phases and finally, the recovery phase as outlined by Kanel (2007). These recovery efforts are ongoing and many people have yet to fully

recover from Hurricane Katrina. Students who evacuated for over 30 days were able to start over at other schools getting back into a routine with better living conditions. These students missed out on the many of the most unpleasant living conditions and destruction when they did move back into the area.

Research question two addressed the impact of Hurricane Katrina and investigated to what extent the traumatic experiences led to increased psychological dysfunction in adolescents in Southeast Louisiana. This study revealed only 5 students (4%) are still coping with the storm. Twenty-eight students (22.6%) reported that they still feel anxious thinking of storms or other hurricanes. Thirty-two students (25.8%) said they feel as if their lives will never be the same since Hurricane Katrina. Nine students (7.3%) reported they still have nightmares or dreams related to Hurricane Katrina. There was a significant difference between the observed and expected frequency of students who felt scared after the storm, are anxious about storms, and those experiencing flashbacks. This finding echoes that of Kessler, Galea, Gruber, Sampson, Ursano, and Wessely (2008), who concluded that hurricane-related trauma, plays a crucial role in the high prevalence of anxiety related disorders in the New Orleans Metro population and that hurricane-related stressors continue to be present several years after Hurricane Katrina. These findings are also consistent with research by Foa et al. (2006) reporting that psychological reactions to trauma include feelings of fear, horror, or helplessness and that disaster situations increase the length of recovery time. Related findings were also reported by Shannon et al. (1994) who stated that adolescents exposed to natural disasters

experienced bad dreams, repetitive thoughts, behavioral avoidance and fear of reoccurrence up to several years following the disaster.

This research examined significant contributing factors to adolescent adjustment and adaptation following Hurricane Katrina in Southeast Louisiana. The purpose of the research was to identify factors most significant to adolescent resilience. Most students indicated they talked to their parents or friends about the hurricane-related trauma. The results of this study revealed that among the subjects in the no impact group, friends helped more than parents (50% friends compared to 21.4% parents). The group that evacuated for less than 30 days reported that parents and friends helped the same amount (37.3%). The group that evacuated for over 30 days reported that parents helped more than friends (35.7% parents compared to 11.1% friends). It is interesting to note that very few students (less than 1%) received help from significant others such as relatives or other adults in their lives.

The finding that parents helped adolescents the most reflects previous research (Beam, Gil-Ravas, Fergus & Zimmerman, 2005; Greenberger, & Chen; 2002; Flynn & Nelson, 1998; McDermott & Palmer, 2002, Ososky et al., 2009; Rowe & Liddle, 2008). McDermott and Palmer (2002) reported that children and adolescents, whose parents were warm and supportive felt more resilient, adapted quicker and had fewer PTSD symptoms. Beam et al. (2002) determined that the most significant protective factors for development of adolescent depression lay in the areas of perceived parental sanctions of parents, friends, VIPs and parental warmth and acceptance. Likewise, adolescents whose parents were suffering from mental illness before the disaster were unable to provide

needed support to their children. Social support and the involvement of caring adults, especially parents were crucial in helping the adolescents process the trauma and adapt to a post-disaster world. Parental reaction and parental mental health is crucial during this time (McDermott & Palmer, 2002).

The finding that friends helped adolescents cope with the post-Katrina trauma reflects previous research reported on coping. Frydenberg (2008) reported that in one adolescent study of 1,013 adolescents aged 11-18 the majority (38%) of those seeking help with an issue sought help from friends, followed by 35% seeking help from parents, and 11% from teachers.

The finding that other adults did not help as much, including relatives, clergy, teachers, coaches, and counselors in the schools is also surprising given the opportunities provided for counseling in the schools by the state of Louisiana (Volunteers of America, 2008). Research (Fergusson & Lynskey, 1996; Masten et al., 1999) has reported that resilient young people were characterized by higher levels of intelligence and problem-solving skills than nonresilient peers. Masten and Coatsworth (1998) found that the two most important characteristics of resilient children and adolescents were caring pro-social adults and good intellectual functioning.

The data for coping was not significantly correlated with the major items measured on the APS-SF. This finding is surprising. The factors listed in the questionnaire were a summation of factors from previously published research on adolescent coping after a disaster (Abramson & Garfield; 2006; Beam, Gil-Ravas, Greenberger, & Chen; 2002; McDermott & Palmer, 2002). This researcher observed that

adolescents seemed to adapt better once they were back into the routine of school and seeing their friends. This also applied to those students who had to endure platooning (multiple schools housed in one location at different times to get school in) with other schools. While not significantly correlated, the frequencies of who helped within groups (parents, friends, relatives), especially within the group that evacuated for over 30 days reflect research by Osofsky et al. (2009) that parents are the primary support system for children after disasters followed by social support provided by connectedness with school and friends.

The findings do show, however, that the scope of the traumatic impact was significantly correlated with each of the major variables measured by the APS-SF. Students were impacted by Hurricane Katrina both mentally and emotionally. Twenty-three percent of the respondents indicated that three years post-trauma, they are still afraid of storms, 26% indicated that they felt their lives would never be the same after Hurricane Katrina, and 7.3 % indicated they are still having nightmares or flashbacks. This data indicates that youth in Southeast Louisiana continue to be impacted by Hurricane Katrina. It also indicated that those who evacuated for less than 30 days had the most mental health issues as reported by the APS-SF. This group represented 53.17% of the sample. The fact that many students reported suffering depression, anxiety, and trauma confirms previous research (Baggerly & Exum, 2008; Osofsky et al., 2009; Shannon et al., 1994) on how natural disasters impact adolescents. T-tests revealed higher levels of PTSD among those who were separated from their friends and higher levels of GAD, PTSD, Depression, and Eating Disorder among those who experienced

high levels of fear during the storm. This is an accurate reflection by those who lived through a major disaster like Katrina that forever changed the landscape and the feeling of safety and security one normally feels in their own home and neighborhood. Families and individuals will remember Katrina for years to come. Those who lost all they had have now started over, but the memories still remain and increased anxiety is felt by most people along the Gulf Coast during hurricane season.

Adolescents who participated in the study were tested in April and May of 2008, almost three years after Hurricane Katrina. The length of time that has passed since the event probably impacted the number of adolescent mental health issues, but should not have impacted the adjustment and adaption mechanisms reviewed.

Implications of the Research Findings

The research implications of this study reinforce the prevalent school of thought that ongoing mental health issues for adolescents should be addressed early on after a natural disaster. The findings indicate that many adolescents met the clinical cut off scores for Generalized Anxiety Disorder, Major Depression, Post Traumatic Stress Disorder, Eating Disorder, and Self-Esteem almost three years after the catastrophe. The implications of these findings are that adolescents may be more affected by disasters than children. Without quick and effective intervention, community-wide disasters continue to have long lasting and serious effects on youth that may include increased risk of substance abuse (Volunteers of America, 2008). Other implications of the research indicated that family involvement and therapy is essential to successfully treating traumatized youth and dealing with dysfunctional family behaviors (Wells, 2006).

Parental psychopathology was found to be crucial in helping to determine youths' stress reactions. Another implication is that counseling services must also be readily available for the adults (Rowe & Liddle, 2008).

All adults who work with children and adolescents must be especially vigilant after a disaster for symptoms of depression, anxiety, and Post Traumatic Stress Disorder (Baggerly & Exum, 2009; Kanel, 2007). Individual and ongoing group counseling in the school systems provided a means of reaching students, although the results do not indicate that students surveyed sought out this type of help. Counseling was left to outside groups who were may not have been as familiar with students in the schools (Volunteers of America, 2008).

All counselors who work with youth should be aware of significant items that may be creating stress for adolescents after a natural disaster. One key question that needs to be addressed is whether the student and their family have adequate shelter, food, and clothing? Counselors must ask if the students experienced personal or family trauma such as loss of a house, family member and/or pet, parents losing jobs, and parents divorcing. Counselors need to ask how many people are living in the dwelling where they are staying. Additional families or other adults crowded into a home were not uncommon after the storm. Counselors should ask if the family is living in a FEMA trailer or some other type of recreational vehicle or trailer. Additional family members sharing rooms, especially in the confines of a FEMA trailer can eliminate an adolescent's chance for privacy and to be alone when needed. Likewise, counselors must ask how the adolescent is coping, whether they are they talking to parents, friends, etc. and whether

the student lost a lot of good friends after the storm and are making new friends. Other questions to ask include: Are they using good coping skills such as faith or athletics or are they turning to drugs and alcohol? Does the student appear hopeless and overwhelmed and is there any suicidal ideation? When school was out after Katrina, many adolescents became more involved in substance abuse. Specific storm related stress and anxiety issues must be addressed such as is the student having nightmares and flashbacks? Did the student see someone hurt or die during the storm? Did they lose a family pet or pets? Are they afraid that another storm will come through? Does the student have nightmares related to the storm? Teachers and significant other adults (coaches, clergy) must be aware of the signs of both substance abuse and Post Traumatic Stress Disorder in order to make an appropriate referral. Students whose homes were destroyed (in the case of Katrina it was the West Bank in New Orleans and Mississippi Gulf Coast), should be identified early on and given individual and group counseling in Post Traumatic Stress Disorder and stress management. The implication is that these students need to be screened as soon as possible for trauma, depression, anxiety disorders, substance abuse and suicidal ideations. This information is consistent with the information reported on the state of mental health in St. Tammany Parish stating that the lack of stability in the community, schools, and families has lead students post-Katrina to try new and risky behaviors including drugs and becoming sexually promiscuous at an earlier age. The report also stressed the critical need for outpatient counseling services for children and families (Volunteers of America, 2008).

The findings of this study lend support to the need for counselors working with youth to be trained in crisis intervention (Ingemann, Jackson, & Pittman, 2009). Counselors living in disaster prone areas should be aware of the factors that contribute to the mental health issues of adolescents addressed in this study, such as higher levels of PTSD and suicide ideation among those separated from friends and higher levels of GAD, PTSD, Depression, and Eating Disorder among those who experienced high levels of fear during the storm. Counselors should also be aware of adolescent resiliency factors that helped students adjust and adapt such as availability of parents and friends after the storm.

Conclusions and Recommendations for Future Research

Cooperation from the local school board would have made access to adolescents easier and provided much needed information about the students' state of mental health to parents earlier in the recovery process. The ability to test an increased number of students in the schools would also have provided more representative sample and more complete research data. Access to adolescents for testing and the requirement to obtain parental consent for those under age 18 increased the difficulty of working with this age group. Certainly, the public school system disallowing the student researcher access to test in public schools also complicated the research process and forced the use of convenience samples within known groups. Ideally, testing should be conducted immediately after the event and then several years later to better assess adolescent impact and coping.

Additional research is warranted to determine factors that help adolescents cope with natural disasters. Future research with a larger sample size may help determine if there are significant differences in the psychological impact of the separate evacuation groups as well as help determine why there was no significant correlation between adolescent coping and the mental health impact of students in this study. Coping skills should also be assessed in more detail, especially with students who scored within the range of psychological impact as measured by the APS-SF. Future research after natural disasters that attempts to identify adaptation and adjustment techniques utilized by children and adolescents is needed. This research should attempt to correlate resiliency factors with mental health issues. Inclusion of resiliency factors with an in-depth review of related coping characteristics may help in the understanding of how well-being is directly influenced by disaster exposure.

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APPENDIX A

Hurricane Katrina Questionnaire

Addendum Questionnaire Student Number _____

Instructions-Please circle the number or numbers that best answer the questions as they pertain to you and your family situation. Some questions may have more than one answer. Please answer all questions.

1. What grade are you currently in?
1. 7th 2. 8th 3. 9th 4. 10th 5. 11th 6. 12th

2. What is your sex?
1. Male 2. Female

3. What best describes your race/ethnicity?
1. Caucasian 2. African-American
3. Hispanic-American 4. Asian-America
5. American Indian 6. Other

4. How many people (total) currently live in your household?
1. 1-2 2. 3-4
3. 5-6 4. More than 6

5. What is the total (approximate) household income of your family?
Please make your best guess on this if you are not sure.
1. \$ 0-20,000 2. \$ 21,000-40,000
3. \$ 40-60,000 4. \$60-80,000
5. \$80,000-100,000 5. Over \$100,000

6. Did you evacuate for Hurricane Katrina?
1. Yes 2. No

7. Please circle the answer to the question below that best describes your families' evacuation during Hurricane Katrina.
1. Did not evacuate
2. Evacuated, came back as soon as possible and stayed in our home, gone less than thirty days.
3. Evacuated, came back as soon as possible, could not stay in our home, gone less than thirty days, lived somewhere else
4. Came back as soon as we could, gone for over 30 days,

8. Was your home damaged by Hurricane Katrina?

1. Yes 2. No

9. On a 1 to 5 scale, please list the amount of damage to your home:
1. No damage 2. Minimal damage (we could live in it)
3. Moderate damage (May or may not have been able to live in it)
4. Moderate to heavy damage (not livable, but lived in it anyway or lived somewhere else).
5. House destroyed (not livable/washed away/beyond economic repair).
10. Were you separated from your parents/guardians during or after the storm?
1. Yes 2. No
11. Did you see anyone get hurt or die during the hurricane?
1. Yes 2. No
12. Circle all the issues you felt as a result of the storm:
1. Depression 2. Post Traumatic Stress Syndrome. 3. Anxiety/Fear
4. Hopelessness 5. Problems Sleeping 6. Loneliness
7. Sense of loss/change to the world as you knew it before Katrina
13. Who provided you the most support coping with the storm and its impact on you?
1. Parents
2. Friends
3. Relatives
4. Counselors/Teachers/Other adults
14. On a 1-5 scale, list the support provided by your parents in helping you cope after the storm:
1- None 2 -Very little 3.-Some 4- Moderately helped
5. Helped a great deal
15. On a 1-5 scale, list the support provided by your friends in helping you cope after the storm:
1 -None 2-Very little 3.-Some 4. Moderately helped
5. - Helped a great deal
16. On a 1-5 scale, rate the support provided by your friends in helping you cope after the storm:
1 -None 2- Very little 3. -Some 4. - Moderately helped
5. - Helped a great deal
17. On a 1-5 scale, rate the support provided by your relatives in helping you cope after the storm:
1- None 2. Very Little 3. Some 4. Moderately helped

5. Helped a great deal
18. On a 1-5 scale, rate the support provided by other adults (counselors, teachers, coaches, clergy) in helping you cope after the storm:
1 -None 2 Very little 3. Some 4. Moderately helped
5. Helped a great deal
19. Please circle the statements that are true for how you coped after Hurricane Katrina:
1. I talked to my friends
 2. I used alcohol or drugs.
 3. I talked to my parents
 4. I utilized my faith, prayed
 5. I played sports
 6. I got involved in other activities at school
 7. I talked to other adults such as counselors, coaches, and teachers
 8. I am still coping and experiencing trauma/depression as a result of Katrina.
20. Circle the statements that impact how Hurricane Katrina affected your life:
1. My house was destroyed or damaged
 2. I had to live in a FEMA trailer.
 3. I had to live in another house.
 4. I had family members that died during or shortly after the storm
 5. I lost a pet because of the storm
 6. I had to move to a new city
 7. I had to change schools
 8. I had to “platoon” with other high schools.
 9. My grades have fallen since Hurricane Katrina.
 10. I lost a lot of my old friends.

11. One or more of my parents/guardians lost their job
12. More people live/lived at my home than before.
13. My parents are separated or getting a divorce
14. I felt really scared during the storm
15. I feel really anxious thinking of hurricanes and other storms.
16. I feel my life will never be the same as it was before the storm.
17. I have flashbacks and nightmares related to the storm.
18. I received counseling as a result of the storm.
19. I now take some type of medicine to help me cope with the trauma I experienced after the storm.
20. I find that I use alcohol or drugs more since Hurricane Katrina.
21. I did not receive counseling, but would take advantage of the opportunity if it was provided.
22. What is your age?
 1. 11/12
 2. 13/14
 3. 15/16
 4. 17/18
 5. Over 18
23. I would like to talk to a counselor about Hurricane Katrina related issues.
 1. Yes
 2. No

Thanks for your help with this survey!
Please complete the Adolescent Pathology Scale-Short Form Next.