

THESIS

CUMULATIVE DISASTER EXPOSURE AND COPING CAPACITY OF WOMEN AND
THEIR CHILDREN IN SOUTHEAST LOUISIANA

Submitted by

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ABSTRACT

CUMULATIVE DISASTER EXPOSURE AND COPING CAPACITY OF WOMEN AND THEIR CHILDREN IN SOUTHEAST LOUISIANA

Many studies have shown how cumulative disaster exposure and trauma can lead to a multitude of negative outcomes. As the risk of cumulative disaster exposure continues to increase because of climate change and population growth, this area of study is becoming increasingly important. This thesis is part of the Women and Their Children's Health (WaTCH) Study, which involves survey work with women and children affected by the 2010 Deepwater Horizon Oil Spill. Specifically, the current study explores the experiences of nine mother-child pairs who reported in the WaTCH study that they had experienced three or more disasters that had a major impact on the child and the household. Open ended, inductive interviews were conducted with these mother-child pairs in order to understand how cumulative disaster exposures impact mothers and their children and what strategies were used to cope with these exposures.

This thesis found that disaster experiences alone did not determine disaster coping and recovery, but rather it was how these exposures combined with secondary stressors, some of which were related to demographic variables, that influenced disaster outcomes. Single parent households, African Americans, and low-income families who experienced long, unstable displacement periods, material, social, and instrumental losses, and problems with school adjustment demonstrated how problems can pile up to slow or hinder current and future disaster coping and recovery. Alternatively, the families who had high incomes, fewer displacements,

less material loss, and high levels of social support were able to recover more quickly and show some adaptive capacity in the face of disasters, growing more and more resilient with each disaster experience.

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I am ever grateful to the participants in this study, who welcomed Lori and I into their homes and shared some very difficult experiences with us. Their generosity provided us with the rich data set that is encompassed in this paper, and they helped progress much needed research on cumulative disasters.

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DEDICATION

This thesis is dedicated to all the parents around the world who have struggled to raise children in the face of cumulative adversity; the ability to endure such difficulties while maintaining a dedication to parenting shows amazing strength and resilience.

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CHAPTER 1: INTRODUCTION

Disaster research, as a field of study, is over six decades old. It is growing in importance, as scientists have been observing an increasing global frequency of extreme weather, high wind speeds, flooding, and droughts (Banholzer, Kossin, and Donner 2014). The rising number of weather-related disasters has corresponded to increased damages and costs over the past four decades (Matthewman 2015). This trend is problematic and is further exacerbated by the fact that larger numbers of people now live in hazard-prone areas, and these populations often lack money and resources to properly prepare and recover from disasters (Schultz and Elliott 2012). The upsurges in overall population, population density, coastal residency, and frequency and magnitude of natural disasters indicates that there will be an increasing number of people exposed to multiple disasters in the future. While disaster research has responded to these trends, increasing the number of scholars working in the field, studies on cumulative disaster exposure also needs to grow, in order to enhance knowledge and ultimately better prepare aid workers and governments in assisting people in disaster recovery.

This thesis adds to the literature and understanding of cumulative disaster exposure, coping, and recovery among mothers and their children who have been exposed to three or more major disasters in Southeast Louisiana. Overall, the study found that people greatly varied in their disaster experiences and outcomes, both within and between families, and these differences were not associated with a single factor; rather, the combination of cumulative disaster exposure, demographic variables, material, social, and instrumental losses, displacement factors, and changes in social support networks influenced mother's and children's abilities to cope and recover. Further, mothers and children were best able to cope with the cumulative exposures

when they had high incomes, familial and non-familial support and assistance, few adversities and material losses, and time to recover from each problem and prepare for the next.

Terminology

In the disaster research literature, several different terms have been used to understand disaster coping, including adaptive capacity, coping capacity, resilience, and vulnerability. These terms have not been used consistently, however and have sometimes been defined in contradictory ways (Brooks 2003). *Coping capacity* is primarily understood as the ability of a person to use available resources and skills in an immediate response to adverse stress; alternatively, *adaptive capacity* is the ability to use previous stressors or experiences to prepare and adapt/change in the face of future stressors and events, so as to minimize their effects (Berman, Quinn, and Paavola 2012; Brooks 2003). However, some research has defined coping capacity as the short-term ability to survive a stressful event and adaptive capacity as the ability to make a longer, more sustainable adjustment in response to a stressful event (Gallopín 2006; Smit and Wandel 2006).

Researchers have also distinguished between *adjustment* and *adaptation*, noting that adaptation and adaptive capacity include a person or system making some significant changes to themselves in order to handle a stressor, while adjustment only includes minor changes to oneself. Adaptation can mean either positive or negative change, however most research tends to view it solely as positive. Additionally, researchers argue that adaptive capacity is dependent on the environment and available resources and can change based on the situation (Gallopín 2006; Smit and Wandel 2006). In this thesis, coping capacity will be defined as the ability to cope with a disaster, while adaptive capacity will be defined as the ability to use one's previous experiences in a disaster to become more prepared and better cope with future disasters.

Both *vulnerability* and *resilience* play a role in a person's ability to cope with a disaster. There have been many different uses of the word vulnerability, and the meanings generally fall into one of two categories: social vulnerability or biophysical vulnerability. *Social vulnerability* is typically defined as the factors that determine or influence a person's ability to cope with stress or change. These factors are influenced by sociodemographic characteristics and associated social inequalities related to individual factors such as age, race, health, income, residence, and employment, and community factors such as urbanization, economy, and population growth. On the other hand, *biophysical vulnerability* is defined as the chance that a climate related event will occur and have a high impact on society (Brooks 2003; Cutter, Boruff, and Shirley 2003). Some authors have combined these definitions, arguing that both social and environmental factors play a role in determining vulnerability and thus both must be considered (Allen 2006).

Vulnerability has a temporal element, in that it can refer to a pre-, during, or post-disaster state. For instance, some definitions of vulnerability describe it as susceptibility to harm and/or potential loss. Others focus on the outcome of a disaster, defining vulnerability based on who a disaster impacted most severely (Cutter et al. 2003; Dow 1992; Gallopín 2006; Timmerman 1981). Allen (2006) argues that vulnerability includes both susceptibility to a disaster's effects and a lack of maintenance of well-being. Finally, some research has labeled vulnerability as the reverse of resilience and resistance, describing it as severe exposure to a stressor, with little human capacity to reduce its impacts (Few 2003). In this thesis, vulnerability will be defined using Wisner, Cannon, and Davis' (2004: 11) definition, "the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist, and recover from the impact of a natural hazard."

Most definitions of *resilience* discuss it as the capacity to adapt or recover from a disaster, with definitions diverging between those that focus on it as a desired outcome, noting resilience as the ability to bounce back, and those who view it as a process, stating that it is solely the ability to adapt (Manyena 2006). Some research views the terms resilience and adaptive capacity as synonymous, defining resilience as the ability to adapt, change, and/or resist a disaster's impacts, recover from a disaster, achieve an acceptable level of functioning, and learn from a disaster, becoming more prepared for future risks (UNISDR 2005). Alternatively, resilience is often times distinguished from *resistance*; as resistance is typically viewed as avoiding any impact of a disaster and resilience is seen as increasing the ease and speed of recovery, which does not stop all dysfunction caused by a disaster, since some distress and dysfunction is considered normal (Norris et al. 2008).

Based on the definitions of resilience and vulnerability, some researchers view them as antonyms, or simply the opposite of one another, while others view them as conceptually distinct (Gallopín 2006; Manyena 2006; Norris et al. 2008). To this end, Cutter, Burton, and Emrich (2010) presented several forms of resilience, including social, economic, infrastructural, institutional, and community resilience, and asserted that a person may have some forms of resilience, such as high social resilience due to high social capacity and capital, while simultaneously having low levels of other forms of resilience, such as lacking economic resilience due to low socioeconomic (SES) status. This thesis adopts the view that vulnerability and resilience are obviously interlinked concepts and hence are not mutually exclusive. Further, it defines resilience as the ability to absorb and recover from a disaster or stressful event, including the ability of a high-risk group or person to achieve better than expected outcomes during a disaster and/or the ability to remain competent and regain or maintain effective

functioning during and/or after a disaster or adversity (Masten and Obradovic 2008; Timmerman 1981).

Cumulative Disaster Exposure

Only a limited number of studies have explored cumulative disaster exposure, in terms of understanding the effects of multiple exposures to acute onset, large-scale events. However, the impact of cumulative adversities and/or traumas at the individual-level has been more widely examined, especially in the psychological literature. Before delving into the previous research, it is important to clarify some of the most prominent terms used within this research: adversity, trauma, and disaster.

While *adversity* is generally used interchangeably with the terms “problems” or “difficulties”, the definitions for the two types of adversities found in the current study, disasters and traumas, have been widely debated. Based off countless definitions used in the previous research, this thesis defines a *disaster* as a sudden event that seriously disrupts a society’s functioning, creating material, economic, environmental, and/or human losses, while a *trauma* includes any emotionally distressing experience. Thus, while a single event can simultaneously be an adversity, trauma, and disaster, these three terms are not always interchangeable. Further, while the current study focused primarily on disaster experiences, other traumatic events and/or adversities were also examined.

Of the available literature on trauma and/or disaster, some of this work tries to understand the effects of different types of trauma exposure. This research has underscored differences between *interpersonal trauma*, where a person is directly targeted or attacked, such as rape and abuse, and *non-interpersonal trauma*, where there is no clear assailant, such as accidents and natural disasters. A study by Kessler et al. (1995), which drew on a nationally representative

sample of 5,877 people between the ages of 15 and 54, showed that Post Traumatic Stress Disorder (PTSD) rates for men and women were higher, on average, for those who dealt with interpersonal traumatic experiences as opposed to those who were exposed to non-interpersonal traumatic events. Similarly, a survey of 1,909 college aged women in Washington, DC by Green et al. (2005) and a meta-analysis on traumatic experiences and disasters by Saylor (1993) both found that interpersonal traumatic events may have more negative psychological impacts on those exposed than non-interpersonal traumas do.

Research comparing multiple and single traumatic event exposures indicates that there are differences between the two. The study by Green et al. (2005) on second year college students, discussed above, also showed that, regardless of trauma type, those who faced multiple traumatic events fared worse than those who endured a single trauma. Tanskanen et al. (2004) examined 1,405 adults in Finland who experienced a variety of traumatic events and found that people exposed to three or more traumatic experiences, no matter the type of trauma, had a significantly higher likelihood of persistent depressive symptoms. The study authors noted that early mental health intervention can help prevent these symptoms from manifesting over the long term. Similarly, a study of 168 adults in California with PTSD revealed that those who had experienced multiple interpersonal traumas over their life-course, particularly when the traumas were severe, tended to have more serious symptoms than those who only experienced one (Scott 2007).

Research on adverse childhood events, particularly when there are multiple exposures, has typically focused on mental health outcomes, however worsened physical health has become a growing focus as well. A study conducted in South Africa on 4,351 people ages 15-years-old and above revealed that increased levels of distress coincided with a rise in number of traumas a

person was exposed to (Williams et al. 2007). In this study, distress was assessed using a global distress scale that measured several items including nervousness, hopelessness, and depression. Research by Dennis et al. (2009) examined the lifetime trauma exposure of 148 women in the United States. It found that that 96% of those with PTSD and 79% of those with Major Depressive Disorder (MDD) had been exposed to three or more traumatic experiences within their lifetime, while only 46% of those without either diagnosis had three or more trauma exposures; indicating a correlation between cumulative traumatic exposures and PTSD and MDD. Similarly, a study on 1,803 young adults indicated that dealing with prior adversities makes you more susceptible to PTSD after a traumatic experience (Lloyd and Turner 2003).

Examining multiple disaster exposures specifically, a nationally representative study on 925 adult participants suggested that cumulative disaster experiences were linked to increased trauma symptoms (Briere and Elliott 2000). In this study, the disaster characteristics, particularly the presence of physical injury, fear of death, and property loss, were better predictors of trauma symptoms than the actual type of disaster experienced. Furthermore, the study showed that trauma symptoms did not change based on how long ago a disaster was experienced, regardless of the severity of the disaster experience.

Studies on older adults and lifetime exposure to traumatic events have revealed similar trends in terms of psychological health and overall wellbeing. One such study, which included 2,515 people in their 60s residing in North Carolina, found that the more traumatic experiences a person had over their lifetime the more severe their PTSD symptoms were (Ogle, Rubin, and Siegler 2013). This study also showed that the number of trauma exposures was a better predictor of PTSD than was the severity of a single exposure. A study of 1,725 Israelis, age 50 or older, indicated that the experience of three or more adversities in one's lifetime influenced

psychological functioning more than the experience of two or fewer adversities (Keinan, Shrira, and Shmotkin 2011). Moreover, the effects of cumulative exposure on psychological functioning included both an increase in distress and well-being. However, the increase in well-being only occurred for those who experienced other oriented adversity, where the primary infliction or impacts of the adversity were on another person. The authors speculate that this could be because of boosts in quality of life and physical health created by caregiving duties.

A related study, which also focused on Israeli adults age 50 and older, showed that, of the 2,603 participants, those who experienced the Holocaust as well as post-Holocaust cumulative adversity, were more likely to have major health problems (Shrira et al. 2010). This research explained that the effects of the Holocaust on survivors was amplified by the additional life adversities. Additionally, while Holocaust survivors did show more resilience in physical and cognitive domains, as compared to those who experienced multiple adversities but did not experience the Holocaust, the former group also dealt with more depressive symptoms. This study indicates that previous trauma exposure can influence, and amplify, the impact of future traumatic exposures.

Research suggests that that cumulative adversity/trauma exposure may also influence behavioral outcomes. A representative sample of 1,786 young adults in an urban community in South Florida revealed an association between alcohol dependence and cumulative exposure to adversity, where cumulative exposure increased the chances of alcohol dependence, irrespective of how long ago the incident had occurred (Lloyd and Turner 2008). Harvey et al. (2016) conducted research on 488 current and 265 retired firefighters in Australia and their rates of alcohol misuse, depression, and PTSD. The research revealed a linear relationship between the number of fatal incidents witnessed or experienced at work and the onset of PTSD, depression,

and heavy drinking. The likelihood of experiencing one or more of these negative outcomes increased with the number of fatal incidents experienced.

Examining research on children and cumulative adversities, Turner and Lloyd (1995) conducted a study on 1,391 Toronto residents between the ages of 18 and 55 and revealed that those who experienced cumulative adversity in childhood were at a higher risk of having MDD, substance abuse/dependence, and/or problematic levels of depressive symptomatology. In addition, this study showed that dealing with multiple adversities after having one of these disorders can enhance the likelihood that one or more of these problems occurs in the future. A study of 1,142 young adults between the ages of 22 and 24 in Chicago also found that multiple adverse childhood experiences were linked to worse mental and physical health and substance abuse in early adulthood (Mersky, Topitzes, and Reynolds 2013).

Most research on childhood trauma assesses adults regarding their childhood experiences; however, research has also begun to study children directly regarding the impacts of their cumulative trauma exposures. One such study focused on 1,398 children in Sri Lanka who had experienced multiple traumatic events, including family violence, civil war, and a tsunami (Catani et al. 2010). The authors found that children who experienced both a traumatic event and the tsunami were more likely to experience higher levels of PTSD, with these rates increasing in relation to the severity of the exposure.

Research conducted in the United States compared 284 children who were exposed to multiple traumas, including surviving Hurricane Katrina, witnessing violence, and being injured in an accident, to those who only had experienced one traumatic event (Scheeringa 2014). The findings from this work also suggested that those who experienced cumulative traumatic events, irrespective of the type of event, had higher levels of PTSD symptoms. A United States study of

170 Head Start students, ages 3 to 5, and their parents examined the health-related quality of life and psychosocial health of children (Roberts, Ferguson, and Crusto 2012). The researchers discovered that those who experienced any trauma had worse health related quality of life and psychosocial health than those that did not, and as the number of trauma experiences increased, health related quality of life and psychosocial health declined.

Not only are children negatively impacted by direct exposure to disaster and adversity; they also may be affected by the accumulation of post-disaster stressors, such as the slow recovery of municipal infrastructure, schools, and their households and ongoing disruptions to social networks and peer groups (Peek 2008). Osofsky and Osofsky (2013) examined the impact that disasters, both natural and human induced, can have on children. The authors noted the susceptibility to multiple disasters in the Gulf region and examined the influence that multiple disaster exposures have on families. They observed that while a single disaster can lead to displacement of children and families, loss of home, property, community, and social support, economic hardship, and potential injury or death of loved ones, multiple disasters can further exacerbate these issues and impede or slow recovery. Economic and social aspects of multiple adversities is also examined in several other studies discussed in Chapter 3 and 4. An overview of the studies discussed above is shown in Table 1.

Table 1: Summary of Literature on Cumulative Disaster Studies

| Study | Location | Population Studies | Type of Adversity |
|-----------------------|---------------------|--|---|
| Briere & Elliott 2000 | USA | 925 adults ages 18-90 | Natural disasters, interpersonal and witnessed violence |
| Catani et al. 2010 | Sri Lanka | 1,398 children age 9-15 | Trauma - family violence, civil war, and a tsunami |
| Dennis et al. 2009 | USA | 148 women of all ages | Trauma - 22 types of interpersonal and witnessed violence |
| Green et al. 2005 | Washington DC, USA | 1,909 women ages 18-24 | Trauma - interpersonal violence and other traumatic events |
| Harvey et al. 2016 | Australia | 753 current/retired firefighters of all ages | Fatal fire incidents |
| Keinan et al. 2011 | Israel | 1,725 people ages 50 and up | Trauma - 17 types of difficult life events ranging from illness to war |
| Kessler et al. 1995 | USA | 5,877 people ages 15-54 | Trauma - 12 types, including interpersonal violence, natural disasters and other "Terrible Experiences" |
| Lloyd & Turner 2003 | USA | 1,803 young adults | PTSD and adversity |
| Lloyd & Turner 2008 | South Florida, USA | 1,786 young adults ages 19-21 | Adversity - 41 types of negative life events, broad range from parental divorce to interpersonal violence |
| Mersky et al. 2013 | Chicago, USA | 1,142 young adults ages 22-24 | Adverse Childhood experiences - including parent/family problems and violence |
| Ogle et al. 2013 | North Carolina, USA | 2,515 people ages 60-69 | Trauma- interpersonal and witnessed violence, natural disasters, and other traumatic events |
| Roberts et al. 2012 | Norther eastern USA | 170 children ages 3-5 | Trauma - 24 types of traumas ranging from accidents to sexual abuse |
| Scheeringa 2014 | USA | 284 children ages 3-6 | Hurricane Katrina, witnessed violence, and accidents/injuries |
| Scott 2007 | California | 168 adults age 19-62 | Trauma- 4 types of interpersonal and witnessed violence |
| Shrira et al. 2010 | Israel | 2,603 people ages 50 & up | Trauma/Adversity - 17 types of difficult life events ranging from illness to war |
| Tanskanen et al. 2004 | Finland | 1,405 people ages 25-64 | Trauma- 6 types, including interpersonal and witnessed violence and natural disasters |
| Turner & Lloyd 1995 | Toronto, Canada | 1,391 Toronto residents age 18 to 55 | Childhood cumulative adversity, MDD, substance abuse, and depressive symptomatology |
| Williams et al. 2007 | South Africa | 4,351 people ages 15 & up | Trauma - interpersonal violence, natural disasters, and other traumatic events |

Despite the multitude of negative impacts cumulative disaster and/or trauma exposures have for children and adults alike, several compilations of disaster research indicate that only a small percentage of people experience these negative impacts (Brewin, Andrews, and Valentine 2000; Goldman and Galea 2014; Norris, Friedman, and Watson 2002; Rubonis and Bickman 1991; Vogel and Vernberg 1993). Further, while some people may face long term mental health

problems because of multiple adversity exposures, most people's mental health problems diminish with time. However, these reviews also listed that children, minorities, single parents, females, low income persons, and those with job or property losses, life threatening experiences, a lack or loss of social support, multiple secondary stressors, pre-disaster mental health problems, bereavement, and severe disaster/trauma exposures tend to have worse outcomes. How demographic variables and secondary stressors work to aid or impede resilience will be discussed in subsequent chapters.

Disasters in Louisiana

As described in greater detail in Chapter 2, this thesis focuses on cumulative disaster exposure among mother-child pairs living in Southern Louisiana. Louisiana was selected for the study because of the multiple disasters experienced within the region over the past two decades and the fact that Louisiana is one of the most disaster-prone states in the United States. In fact, a 2014 report by Core Logic ranked Louisiana as the third most disaster-prone state in the country, having one of the highest annual number of disasters in the nation (Bolton et al. 2014).

Louisiana is prone to hurricanes because of its coastal location near the Gulf of Mexico and is susceptible to flooding due to its proximity to water from the Gulf, the Mississippi River, and various other outlets (Roth 2010). Disaster losses in the area have been exacerbated over recent decades due to both natural and human causes associated with wetland loss, ecological destruction, coastal erosion, and saltwater intrusion (Tierney 2014). Furthermore, the levee systems throughout southern Louisiana, particularly in New Orleans, which were ostensibly designed to reduce disaster risk, have increased hurricane related damages and hazards (Penland et al. 2002; Roth 2010; Tierney 2014). This is because of levee breaches that worsened flooding caused by several different hurricanes, including both Hurricanes Katrina and Rita.

Louisiana’s population size of about four and a half million people is relevant when examining disaster risk in the area, as more people residing in the state also means more people are exposed to various hazards (Census 2015). Moreover, Louisiana’s population density of about 105 people per square mile may also contribute to the high amounts of people exposed to disasters (Census 2015). In Jefferson, Lafourche, Orleans, Plaquemines, St. Bernard, St. Mary, and Terrebonne parishes, which are the focus of the current research, there are over a million people, or nearly one-fourth of the state’s population (Census 2015). This large coastal population leaves a swatch of residents exposed to disasters in an already disaster prone area.

Figure 1 shows a map of Louisiana and its parishes.

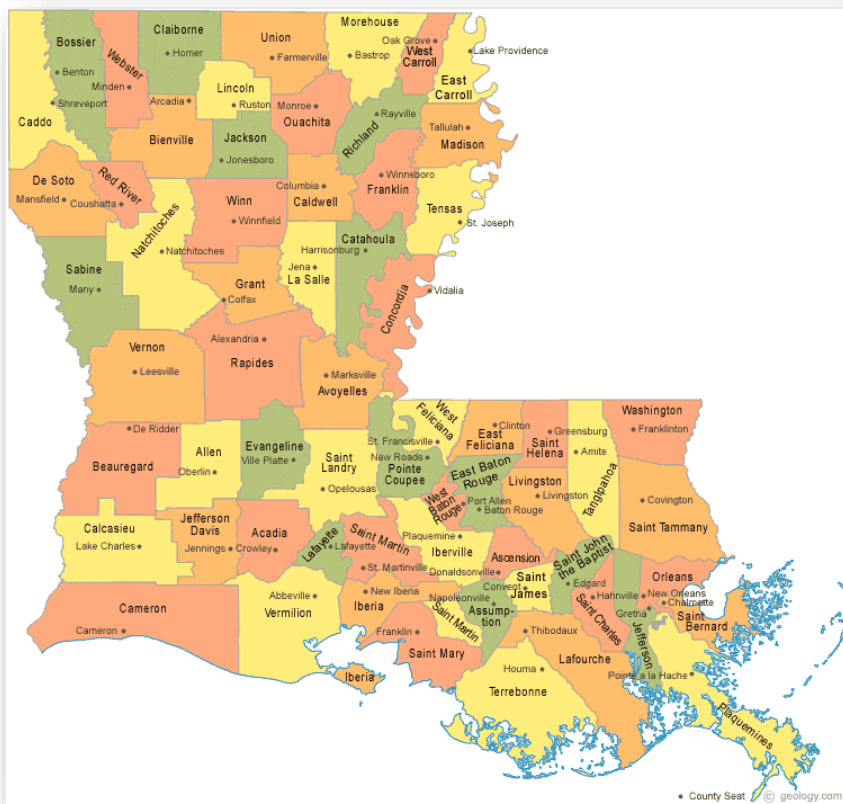


Figure 1: Map of Louisiana Parishes (Geology.com 2017)

Below, I review the major economic, social, and environmental costs and consequences of several major disasters that have affected coastal Louisiana residents over the past five decades. This brief review is meant to give broader context to the events that participants in the present study reported experiencing and being affected by.

Hurricane Betsy (1965)

In September of 1965, Hurricane Betsy made landfall as a Category 3 hurricane. The hurricane made landfall in Grand Isle, Jefferson Parish, with wind speeds of 160 miles per hour and its wind speeds remained above 100 miles per hour as it struck the rest of Southeast Louisiana. The hurricane brought storm surges of 10 feet in New Orleans and 15 feet in Grand Isle causing extensive flooding (Roth 2010). St. Bernard, Lafourche, St. Charles, St. John the Baptist, Terrebonne, Plaquemines, and Jefferson parishes were most badly impacted by this flooding, with more than half of the area in each parish being flooded. Orleans, Plaquemines, St. Bernard, and Jefferson Parishes suffered the most economic damages (Corps of Engineers 1965)

While estimates vary, the hurricane killed about 80 people, caused nearly \$1.5 billion in losses, and damaged or destroyed 164,000 homes, with most of its impacts being in Louisiana (Roth 2010; University of Rhode Island 2015a). In addition, because of the scale of loss and failures of local levees and the city's pumping system caused by Hurricane Betsy, the U.S. Army Corps of Engineers created a flood protection system for New Orleans (University of Rhode Island 2015a). Figure 2 shows the path and rainfall severity of Hurricane Betsy.

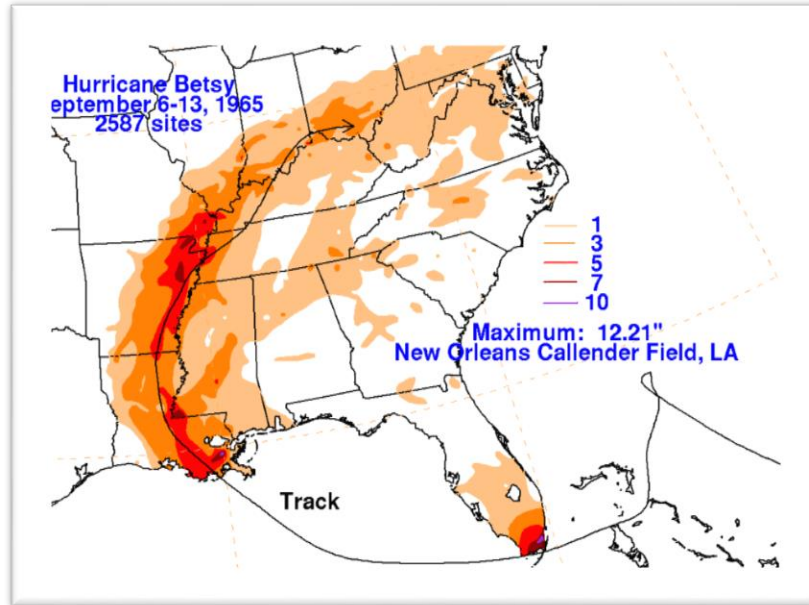


Figure 2: Path of Hurricane Betsy and Rainfall Levels (Roth 2013a)

Hurricane Juan (1985)

In October 1985, Hurricane Juan passed Louisiana as a Category 1 hurricane, reaching maximum wind speeds of 49 miles per hour. Despite its low intensity, Juan’s storm surges, heavy rains, and erratic movements caused it to have a significant impact on the state. The hurricane’s highest levels of rainfall were in Lafourche, Caddo, Evangeline, Rapides, Franklin, Jefferson, and Calcasieu Parishes. Its storm surges, which were between 5 and 9 feet, led to severe flooding and the destruction of three bridges in the hardest hit areas: Terrebonne, Jefferson, Lafourche, and St. Tammany parishes. In all, Hurricane Juan killed 12 people and generated about \$1.5 billion in economic losses (Case 1986; Roth 2010). Figure 3 shows the path and rainfall severity of Hurricane Juan.

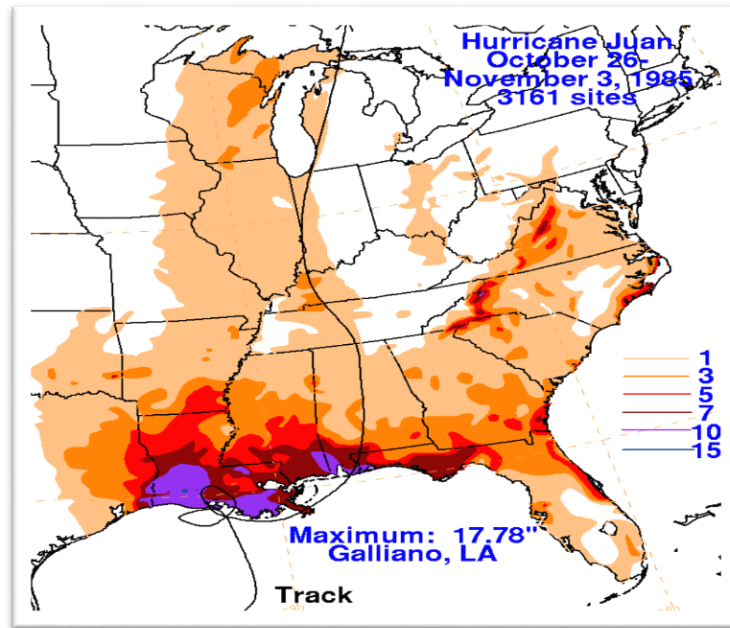


Figure 3: Path of Hurricane Juan and Rainfall Levels (Roth 2013d)

Hurricane Ivan (2004)

Hurricane Ivan made landfall in Alabama as a Category 3 hurricane in September 2004, with wind speeds topping 120 miles per hour. The storm generated heavy rains and tornadoes throughout the Southeastern United States, heading Northeast from Alabama, then looping down to southern Florida; the storm weakened as it reached southwest Louisiana. While the Hurricane created 117 tornadoes, had rainfall averaging 7 inches and reaching up to 15 inches, and had a storm surge of 10-15 feet, no tornadoes or peak levels of rain and storm surges occurred in Louisiana.

Overall, Hurricane Ivan was responsible for over 100 deaths, with about a quarter of these occurring in the United States and none occurring in Louisiana. The damages from Ivan resulted in nearly \$19 billion in losses in the United States (Stewart 2004). Although most of the damage produced by Ivan occurred outside Louisiana, the southern region of the state did experience some rainfall of up to two inches that caused minor flooding and minimal damage in

St. Bernard, Plaquemines, and St. Tammany parishes (Trotter 2004). Figure 4 shows the path and rainfall severity of Hurricane Ivan.

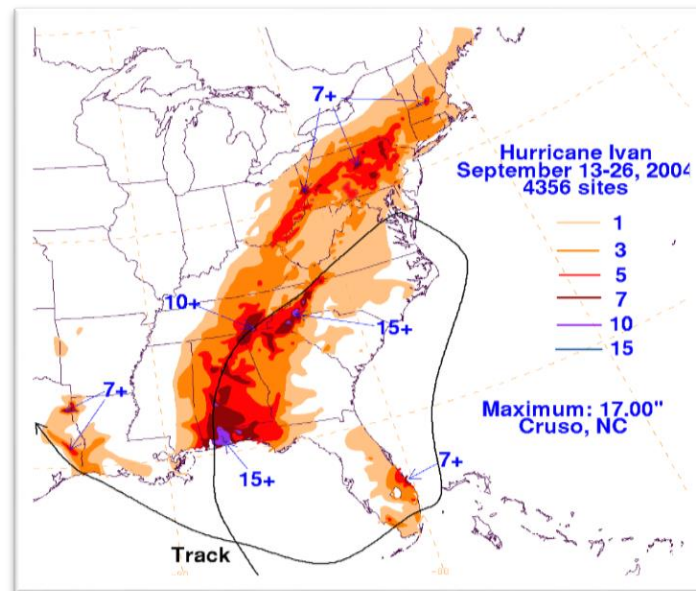


Figure 4: Path of Hurricane Ivan and Rainfall Levels (Roth 2004)

Hurricane Katrina (2005)

Hurricane Katrina made its second, and most devastating, landfall along the U.S. Gulf Coast on August 29, 2005. Katrina, a Category 3 hurricane, reached wind speeds of up to 140 miles per hour and generated storm surges between 4 and 30 feet and rainfall of up to 14 inches (Kent 2006; Roth 2010). Even though the hurricane's rainfall, wind speeds, and storm surges were not particularly extraordinary, they did cause damages in Plaquemines, Jefferson, and St. Tammany parishes. Perhaps most devastating for the state of Louisiana, these hurricane conditions, along with the levee breaches in New Orleans, left 80% of the city of New Orleans underwater (DOA 2015).

Hurricane Katrina is considered the mostly costly disaster in U.S. history, killing over 1,800 people, about 1,500 of which were residents of Louisiana, and causing about \$81 billion of damage in the United States, with much of this damage occurring in Louisiana (Roth 2010).

Figure 5 shows the path and rainfall severity of Hurricane Katrina and Figure 6 shows the level of flooding in New Orleans.

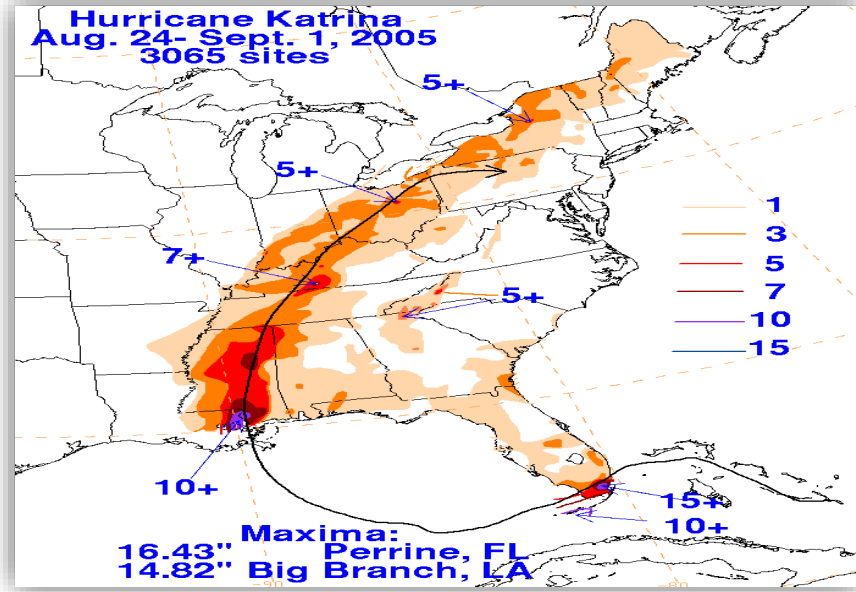


Figure 5: Path of Hurricane Katrina and Rainfall Levels (Roth 2013e)

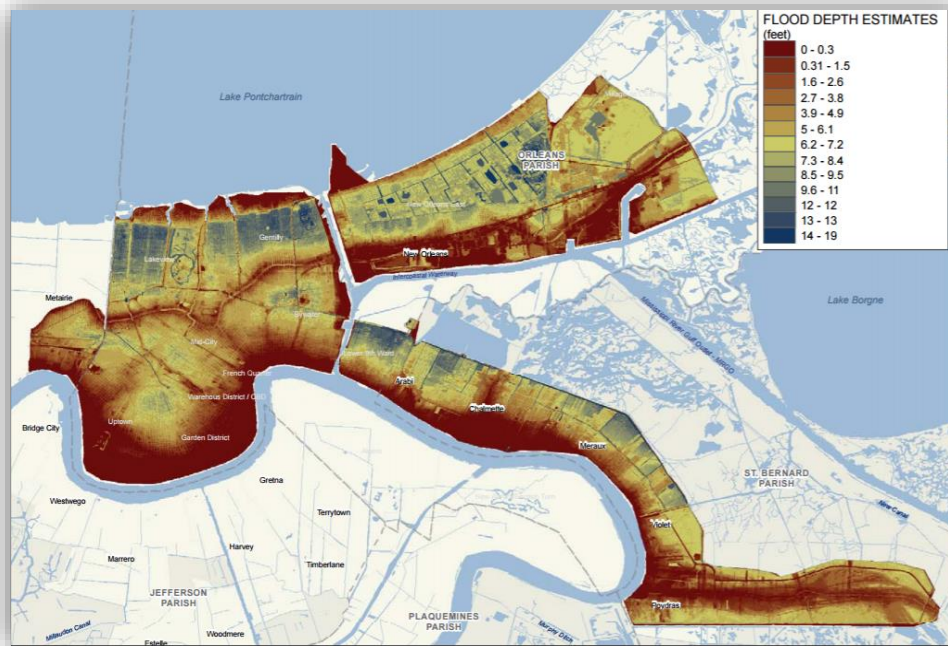


Figure 6: Flooding Severity in New Orleans August-September 2005 (Kent 2006)

Hurricane Rita (2005)

Hurricane Rita made landfall in Louisiana in September 2005 as a Category 3 hurricane, with wind speeds at 115 miles per hour. Rita primarily affected Southwest Louisiana, devastating Cameron parish, but also caused flooding in several other parishes, including Terrebonne, Calcasieu, and Vermilion. Given that it occurred so soon after Katrina, Rita led to mass evacuations along much of the western Gulf Coast. Rita generated heavy winds and rains and spawned some tornadoes. Additionally, several of the levees breached by Hurricane Katrina, only a few weeks prior, were further overtopped during Rita, adding to flooding in the New Orleans metropolitan area. An estimated 120 people died directly because of the hurricane and it ended up costing \$10.5 billion in damages (Kent 2006; Roth 2010; University of Rhode Island 2015b). Figure 7 shows the path and rainfall severity of Hurricane Rita.

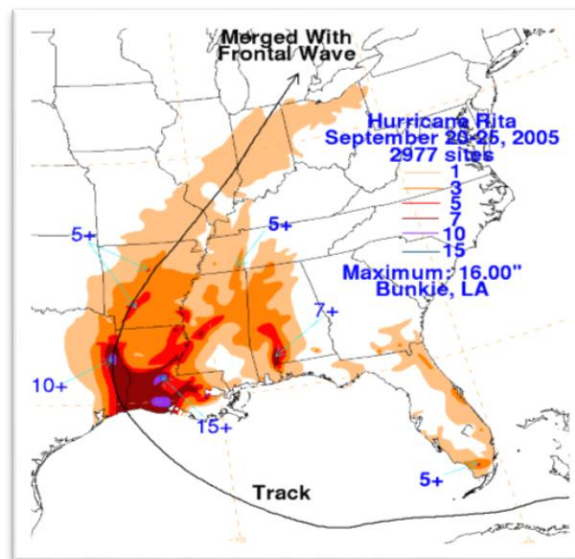


Figure 7: Path of Hurricane Rita and Rainfall Levels (Roth 2013f)

Hurricane Gustav (2008)

Hurricane Gustav made landfall in Louisiana in September 2008 as a Category 2 Hurricane, reducing in intensity as it passed through southern and western Louisiana. The

hurricane's storm surge was 12-13 feet, its windspeeds went up to 177 miles per hour, and its rainfall peaked at 21 inches, producing flooding around rivers in Louisiana. Gustav also generated over 40 tornadoes, 25% of which touched down in Louisiana. The hurricane killed over 100 people; seven of those deaths occurred in Louisiana, with nearly all the other deaths occurring in the Caribbean countries (Haiti accounted for more than 3/4ths of these deaths). Hurricane Gustav caused over 200 million dollars of damage in Jamaica, severe damages in Haiti and the Dominican Republic (although exact costs are not available for these two countries), and \$4.3 billion in damages in the United States. About half of these damages occurred in Louisiana (Beven and Kimberlain 2009; Roth 2010). Figure 8 shows the path and rainfall severity of Hurricane Gustav.

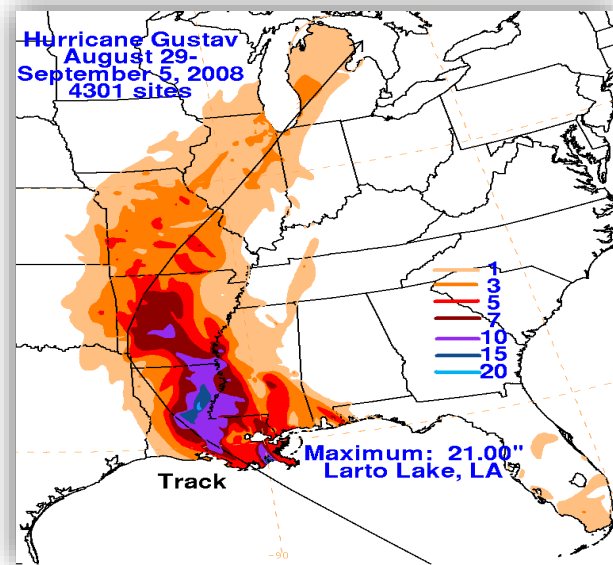


Figure 8: Path of Hurricane Gustav and Rainfall Levels (Roth 2013b)

BP Oil Spill (2010)

In April 2010, the British Petroleum Deepwater Horizon drilling rig exploded near the Louisiana coast, killing 11 workers and leaking 200 million gallons of oil into the Gulf of

Mexico over the period of three months. The oil spill was the largest and most ecologically devastating in U.S. history and, despite clean-up efforts, it has had long lasting negative impacts on the local environment, economy, and health of residents. The damages of the oil spill are still being studied and may still be unfolding (Peres et al. 2016). Stretches of coastal land from Florida to Texas were “oiled” as a result of the spill. The regions that were directly polluted by the oil are shown in Figure 9. Fishing, shrimping, crabbing, and other operations were shut down for long periods during and after the spill, which had a major impact on resource-dependent communities.

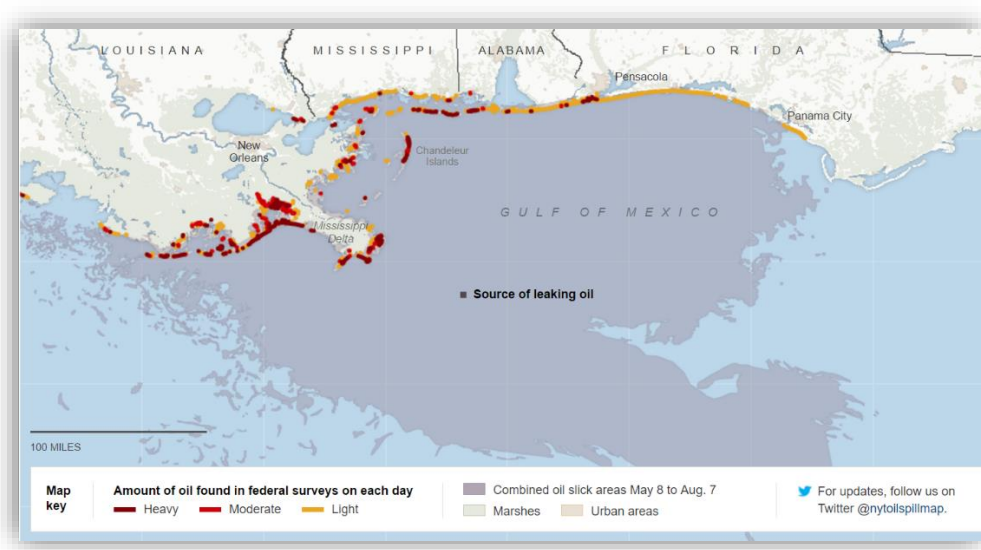


Figure 9: Gulf Coast Oil Pollution 4 Months after the 2010 BP Oil Spill (Aigner et al. 2010)

Hurricane Isaac (2010)

Hurricane Isaac made landfall in southeast Louisiana at the end of August 2012, as a Category 1 hurricane. Isaac caused 12 inches of rainfall on average in the Gulf Coast area and over 19 inches of rainfall in New Orleans. Its storm surge caused flooding within southeast Louisiana, with Plaquemines and St. Bernard parishes receiving the most amount of water. The hurricane led to 17 tornadoes in the U.S., but none of them occurred in Louisiana (Berg 2013).

Hurricane Isaac killed 34 people total, including four people in Louisiana, and created almost a million dollars of damage in the U.S. (Berg 2013).

The repairs to the federal levee system put in place after the hurricanes of 2005 protected much of New Orleans from damage, but other regions in the Louisiana did not fare as well, with the hurricane damaging 59,000 homes in the state. Most of these losses were concentrated in St. John the Baptist, Plaquemines, and Jefferson parishes (FEMA P-938 2013). In addition, the hurricane caused nearly a million homes and businesses to lose power and negatively impacted local agriculture (FEMA P-938 2013). Moreover, about half a million pounds of oil material—which was still in the water because of the BP Oil Spill—was brought to the surface and deposited on coastlines as a consequence of the storm (Berg 2013). Figure 10 shows the path and rainfall severity of Hurricane Isaac.

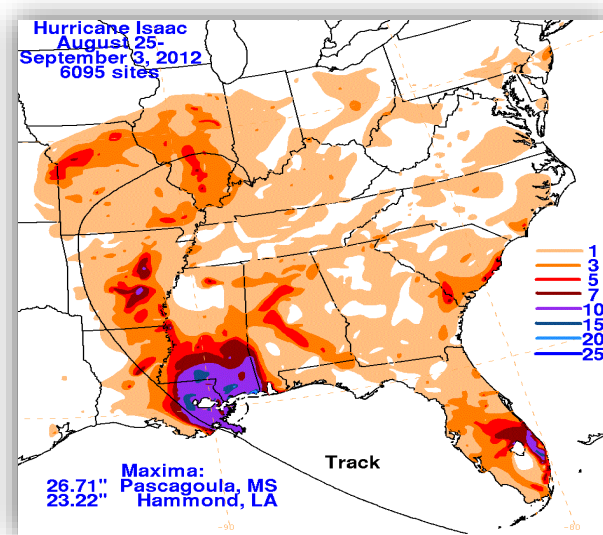


Figure 10: Path of Hurricane Isaac and Rainfall Levels (Roth 2013c)

Thesis Overview

This thesis summarizes research conducted with mother-child pairs who have been exposed to three or more of the disasters described above in southeast Louisiana. The next

chapter details the methodological approach to the study, including a discussion of the research design, sample selection, data collection efforts, data analysis, and study limitations. The following three chapters focus on the key findings from the study. Specifically, Chapter 3 describes the demographic composition of the nine mothers and children in the current study and examines how these factors may have influenced participant's ability to cope with and recover from each and all disaster experiences. Chapter 4 examines trends regarding the displacements and material, instrumental, and social losses experienced by the study participants. It then discusses Hurricane Katrina's significance and the disaster experiences of six of the nine mother-child pairs, demonstrating how a mixture of factors created a problem pile up for these participants and their families that hindered coping and recovery. Chapter 5 describes how social support can mitigate against disaster impacts, particularly when combined with high income and low severity of disaster exposures. It uses the experiences of the last three mother-child pairs to illustrate how this occurs. Finally, Chapter 6 concludes this thesis by reviewing the overall findings of this research, describing some policy implications that these findings may have, and suggesting paths for future research.

CHAPTER 2: METHODS

This chapter discusses the methodology of the current study. I begin by describing the Women and Their Children's Health (WaTCH) study, which is a larger study that I draw on for this thesis. I then describe the sampling and interviewing procedures in this study, some basic information on the study participants, and the methods and procedures used for data analysis. Next, I address the research questions of the current study. Finally, I provide an overview of challenges and limitations in this study, including recall consistency, time gaps and memory, impacts of multiple disaster exposures on memory, high impact disasters and memory, recall ability, age and memory, and sampling and interview issues.

Research Design

The following section describes the methodology of the WaTCH and current studies. I discuss sampling and data collection approaches and the characteristics of study participants.

WaTCH Study

The Women and Their Children's Health (WaTCH) study is a longitudinal study of women and their children living in Jefferson, Lafourche, Orleans, Plaquemines, St. Bernard, St. Mary, or Terrebonne parishes in southeast Louisiana. These parishes were selected because they were all affected by the 2010 BP Deepwater Horizon Oil Spill.

This five-year project, funded by the National Institute of Environmental Health Sciences (NIEHS), involves public health researchers and social scientists from several collaborating universities and examines the potential short and long term health impacts of the 2010 BP Deepwater Horizon Oil Spill on approximately 620 mother-child pairs living in southeast

Louisiana (Peres et al. 2016; Rung et al. 2016). Additionally, this research project focuses on community resilience in the wake of the nation's largest oil spill (Abramson et al. 2014).

As of March 2017, seven scholarly papers have been published utilizing findings from the WaTCH study. When examining physical health, the findings indicate that women in the WaTCH study who lived in unfavorable neighborhoods had higher rates of obesity than those that did not (Sullivan et al. 2016). Results on mental health showed that women in southern Louisiana who had physical exposure to the BP Oil Spill self-reported more mental distress and memory loss in the past month, whereas those who were both physically and economically exposed to the oil spill had higher rates of physical health symptoms, memory loss, and domestic violence after the disaster (Peres et al. 2016; Rung et al. 2015; Rung et al. 2016). Furthermore, physical exposure to the oil spill was linked to higher economic exposure, and both types of exposure were associated with higher levels of depression (Rung et al. 2016; Rung et al. 2017).

The research publications also examined factors that mitigated against mental health problems for adult female participants. Social capital and social support were associated with reduced depression rates, and both were negatively related to oil spill exposure (Rung et al. 2017). Not completing high school, lower household income, less social support, damage to commercial fishing areas, higher economic exposure to the oil spill, and smelling the oil often were all linked to higher levels of depressive symptoms (Gaston et al. 2016).

For the WaTCH study, adult female participants were primarily recruited through an address based sampling frame, in which the U.S. Postal Service's Computerized Delivery Sequence File, which covers 100% of all U.S. households, was used and 46,649 telephone numbers were called (Peres et al. 2016). In addition to this sampling method, some participants were recruited by friends and family or were volunteers (Peres et al. 2016).

The criteria for adult women participants included: being between the ages of 18 and 80 at the time of the oil spill; living within one of the seven parishes listed above; being a female head of household, whether partnered or not; being mentally, physically, and linguistically capable of completing a telephone interview; and not participating in either the Louisiana Gulf Women's Health Study (LGWHS) or the NIEHS GuLF Study, in order to ensure that participants were not overburdened by the research (NIEHS 2012).

The study team at Louisiana State University sent potential participants a letter describing the study and eligibility criteria. Eligible women were invited to enroll. Women participants who were mothers also had the option to have one of their children participate within the study. The criteria for inclusion of the child participants included being between the ages of 7 to 18 at the time of the oil spill; living within one of the seven parishes listed above; and being mentally, physically, and linguistically capable of completing a telephone interview. Which of the mothers' children was chosen to participate was based on the children's' birthdays, with the child whose birthday was closest to the date of the oil spill being selected to participate.

Researchers at the Epidemiology Data Center at the Louisiana State University Health Sciences Center collected data using Research Electronic Data Capture (REDCap) tools (Rung et al. 2016). The adult female participants were invited to complete two surveys. The first wave was conducted at the respondents' homes between December 2012 and September 2014. This instrument focused primarily on health-related questions. The second wave was conducted over the telephone between June 2015 and May 2016 and included many of the same questions as the first survey, but also added in questions about the disasters experienced by each participant and the impact level each disaster had. Child surveys for both wave 1 and 2 were conducted within

the same time frames as the mother surveys. The final wave 1 sample included a total of 620 mother-child pairs. wave 2 retained 445 mother-child pairs.

Exposure Outliers Study

The research presented in this thesis is part of a sub-study for the WaTCH project. This project – the Exposure Outliers study – drew upon the WaTCH survey sample to identify a subsample of respondents who indicated that they had experienced three or more major disasters. The study team reviewed the wave 2 survey data as collected from the mothers and the children, and then analyzed the data to identify mother-child pairs that indicated that they had experienced three or more of the following disasters: Hurricane Katrina in 2005, Hurricane Rita in 2005, Hurricane Gustav in 2008, the BP Oil Spill in 2010, Hurricane Isaac in 2012, and any other “disasters experienced” as identified in the “other” category of the survey.

In addition to indicating that they had experienced three or more major disasters, the data was further analyzed to find the respondents who indicated that the disaster had 1) had a major impact on the focal child in the study; and 2) had a major impact on the household. In order to be included in the final sample, both the mother *and* the child had to endorse the disasters, and the major impact statement. This analysis ultimately yielded nine mother-child pairs who met the selection criteria.

Interview Preparations.

To prepare for the interviews, I conducted backfilling of the wave 1 and wave 2 surveys for the nine mother-child pairs, moving data from the surveys from an excel file onto the survey sheets. In advance of traveling to the Gulf Coast and as part of interview preparations, we reviewed the wave 1 and wave 2 surveys that the mothers and children had completed as part of the WaTCH study. We used this information, along with other topics we wanted to explore,

including social capital and disaster coping and recovery strategies, to formulate interview scripts for the nine mother-child pairs.

We developed two interview scripts, one for the mothers and one for the children. However, we also included some unique questions for each participant based on their survey responses and readjusted our questions during the interviews, based on participant responses. The questions from the WaTCH surveys that were used to formulate the interview scripts are presented in Appendix A.

Once these respondents were identified, Dr. Lori Peek, the PI on the Exposure Outliers study, contacted each of the mothers by telephone after the Louisiana State University team first reached out to alert the mothers that Dr. Peek would be calling (this was required by the Institutional Review Board at Louisiana State University and Colorado State University). All nine of the mothers agreed to be contacted, and so Dr. Peek began calling them in the spring of 2016. She explained over the telephone that she too was part of the WaTCH study team (by now the women had already completed two surveys, so they were familiar with WaTCH). She then let them know that they and the child who had completed the survey had been selected for the Exposure Outliers study, based on their endorsement of the survey items. All nine of the mothers agreed to be interviewed, and all also said their children would be happy to participate.

Because we traveled from Colorado to Louisiana for the interviews, Dr. Peek and I established dates when we could both travel in June of 2016. Then Dr. Peek called and texted the mothers and scheduled the first four mother-child pairs for interviews. The remaining five mother-child pairs were interviewed during our second trip to Louisiana in September of 2016. We thus collected a total of 18 qualitative interviews over our two data collection trips.¹

¹ We also conducted interviews with four additional family members of the outliers, including the sister and nephew of one of the mother participants and two additional children of another mother participant. We decided to include

Interviews

The interviews took approximately 30 minutes for the children respondents, although they ranged in duration from 15 minutes to an hour. The interviews with the mothers were longer, and they averaged over an hour with the shortest interview being 22 minutes and the longest lasting over 2 hours. We audio recorded all of the interviews, with respondents' permission. All participants received a \$60 gift card for participating in the study.

In the interviews, we asked the mothers and children about: their relationship with their families; their disaster experience for each disaster exposure; lessons learned from the cumulative disaster exposures; health problems they had experienced; sources of social support that helped them cope and recover from the disasters; discussions with friends and/or family regarding the disasters; and plans for future disasters. For children, we also asked about: school experiences during and after the disasters; friendships; helping around the house before and after the disasters; and future aspirations. For mothers, we asked additional questions about: where they grew up; their children's fathers; parenting during disasters; community changes caused by disasters; and the impacts the disasters had on their child. Appendix B contains the child interview script and Appendix C shows the mother interview script.

At the time of the interviews, 10 of the interviewees lived in Orleans parish, six were in Jefferson Parish, and two were in Plaquemines Parish. Of the 18 mother-child interviews, 13 were conducted by both Lori Peek and me, and the other five were conducted by Lori Peek alone. We conducted all interviews at the participants' homes, other than one interview with a child respondent which took place at the Xavier University library.

these additional family members at the request of the exposure outliers themselves, and we felt it was important to honor their request in order to maintain our relations with the study participants. In the end, however, we did not use the data from these supplemental interviews for analysis as the additional participants were not part of our sampling procedure and they did not remember much from the disasters that we were interviewing them about.

Even though we tried to conduct the interviews privately, since they were held in the participant's homes, sometimes there were other people at home or "listening in" when we did the interviews. In the end, 12 of the 18 interviews were conducted alone with only us (the interviewers) and the respondent, while six interviews were conducted with other family members around. Those other family members occasionally chimed in with additional information during the interviews; we found these insights helpful and we did not feel it affected the overall quality or veracity of the data we collected.

Data Transcribing and Analysis

The 18 audio interview files were transcribed by me and another graduate student in the Department of Sociology at Colorado State University. Once the data were in textual form, I uploaded them into ATLAS.ti, which is a qualitative data analysis software program. I then began the process of completing first-order coding, looking for any patterns that might exist within the transcripts. This initial coding led me to create a series of meta codes and sub codes related to the themes such as age, class, race, memory, social support, friendships, losses, displacement, and reactions and recovery to the disasters. Once the patterns were identified, I created a spreadsheet to further examine these trends and to actually complete some simple counts of patterns in the data. During my third pass of coding, I began to select illustrative quotes from the interviews to accompany the identified patterns and make them more understandable in the final text.

Interviewees

The following sections include more contextual information regarding the Exposure Outliers participants.

Disaster Exposure

The current study chose those mothers and children who both marked on wave 2 of the WaTCH Surveys that at least three disasters had a “major impact” on their households/families and the focal child. In the end, all 18 interviewees reported experiencing at least four disasters within their lifetimes. Table 2 displays the disasters experienced and the level of severity each disaster had on the participants’ households. Table 3 shows the severity of impact disasters had on the focal children.

Table 2: Disaster Experience and Impact for Households*

| Family | Household Disaster Exposure | Katrina 2005 Impact | Rita 2005 Impact | Gustav 2008 Impact | BP 2010 Impact | Isaac 2012 Impact | Other Disasters Exposure |
|-----------------|------------------------------------|----------------------------|-------------------------|-------------------------------|-----------------------------|--------------------------|---------------------------------|
| Smith | 5 disasters | Major | Major | Major - Mom/ None - Child | Major | Major | None |
| Johnson | 6 disasters | None | Major | Major | Major | Major | Juan – Minor (Mom Only) |
| Michaels | 4 disasters | Major | None | Major | Some - Mom/ None - Child | Major | None |
| Jackson | 5 disasters | Major | Major | Major | Major | Major | None |
| Allen | 6 disasters | Major | Major | Minor - Mom/ Major - Child | Major | Some | None |
| Bryant | 6 disasters | Major | Major | Major | Major | Major | Ivan – Some (Mom & Child) |
| Green | 5 disasters | Major | Major | Major | Major | Major | None |
| Jones | 6 disasters | Major | Major | Major | Major | Major | Betsy – Minor (Mom Only) |
| Williams | 6 disasters | Major | Major | Major | Major | Major | Betsy – Minor (Mom Only) |

*Mother and child responses were identical in most cases, all discrepancies are listed in the table

Table 3: Disaster Experience and Impact for Child*

| Name | Katrina 2005 Impact | Rita 2005 Impact | Gustav 2008 Impact | BP 2010 Impact | Isaac 2012 Impact |
|------------------|---------------------|------------------|-------------------------------|-----------------------------|------------------------------|
| Alex Smith | Major | Major | None - Child/ Major – Mom | Major | Major |
| Jessica Johnson | None | Major | Major | Major | Major |
| Eric Michaels | Major | None | Major | None - Child/ Some - Mom | Major |
| Jason Jackson | Major | Major | Major - Child/ Some – Mom | Major | Some - Child/ Major - Mom |
| Olive Allen | Major | Major | Major - Child/ Minor – Mom | Major | Some |
| Miranda Bryant | Major | Major | Major | Major | Major |
| Matthew Green | Major | Major | Major | Major | Major |
| Samantha Jones | Major | Major | Some | Major | Some - Child/ Major - Mom |
| Charlie Williams | Major | Major | Major | Major | Major |

*Mother and child responses were identical in most cases, all discrepancies are listed in the table

Demographic Characteristics

The majority of the interviewees, including seven of the mother-child pairs, identified themselves as African American, one pair identified as Caucasian, and one pair identified themselves as other. Annual household income was \$50,000 or above for two mother-child pairs, below \$20,000 for two mother-child pairs, and between \$20,000 and \$50,000 for five mother-child pairs.

Of the child interviewees, six were male and three were female. All of the mothers identified as female. The children’s ages at the time of the first disaster they all experienced, Hurricane Katrina, ranged from age 2 to age 7 and the mothers ranged in age from 22 to 52 during Hurricane Katrina. Of the mothers in the study, three were married, two were divorced, two were single, one was widowed, and one did not identify her relationship status. Chapter 3 offers a more in depth look at the mother-child pairs’ demographic features.

Research Questions

I began this work with a general question related to the experiences of mothers and children exposed to multiple disasters. As with much inductive work, I then focused the research

questions over time, as I carried out data collection and analysis. In the end, I explored the following questions in this thesis:

How does cumulative disaster exposure impact mothers and their children?

What strategies did mothers and children use to cope with multiple disaster exposures?

Study Purpose

The current study is qualitative in nature and used an inductive approach, in which data were gathered to shed additional light on the issue of multiple disaster exposure. Qualitative research of this nature is important because it helps to better understand the circumstances of anomalies or outliers, in this case women and children who have dealt with multiple disasters (Ragin, Nagel, and White 2004). Indeed, examining statistical outliers in depth is an appropriate way to understand what differentiates them from the general population. Moreover, qualitative research can help change, affirm, or deny theories on cumulative disaster exposure, while providing a better understanding of facts and data uncovered on the topic by quantitative research.

Challenges and Limitations

Interviewing mothers and children so many years after experiencing many different disasters came with its own set of challenges and resulted in some limitations to the work. I address these issues, in turn, below. Within these discussions, I draw upon research studies to place the challenges that I experienced in this study into a broader methodological and empirical context.

Recall Consistency

The WaTCH survey data and the interviews conducted for the present study offered detailed information about participants in terms of their health, school, living circumstances, and

social and financial problems. In comparing the information gleaned from the surveys to the interviews, there was obviously overlap in some cases, while in others there were inconsistencies.

Most relevant to the present study was the issue with recall consistency concerning the selection of “Major Impact” on the survey, compared to the ability of respondents to actually articulate what a major impact meant. This was especially true of child respondents, where seven of the nine children who marked a disaster as having a major impact on them in the surveys, either had trouble recalling the disaster experiences, recanted their previous response, stating that the disaster did not have a major impact on them, or were unable to articulate any major impacts of the disaster; of these children four showed inconsistencies regarding the impacts of more than one disaster.

Recall inconsistency occurred the least for Hurricane Katrina and the BP Oil Spill, possibly because these two disasters were the largest hurricane and oil spill experiences the children had endured. In all but one of the disasters, recall inconsistency was almost evenly split between problems with recalling a disaster within the interview, when having previously listed it as having an impact in the WaTCH survey, and marking a certain level of impact in the survey while articulating a different level of impact in the interview. The exception to this trend was Hurricane Isaac, in which all recall inconsistency was caused by articulating different levels of impacts, not a lack of recall during the interviews. Table 4 shows the distribution and type of recall inconsistency the children had experienced by disaster.

Table 4: Child Recall Inconsistency by Disaster

| Disaster | Number of Inconsistencies for Children | Consistency caused by lack of recall | Consistency caused by different answer |
|-------------------|---|---|---|
| Hurricane Katrina | 3 | 1 | 2 |
| Hurricane Rita | 5 | 3 | 2 |
| Gustav | 5 | 3 | 2 |
| BP | 4 | 2 | 2 |
| Isaac | 5 | 0 | 5 |

These gaps between interview and survey responses occurred less frequently with the mother interviewees, with two out of the nine mothers showing recall inconsistency. One of these mothers noted major impacts from Hurricanes Isaac and Gustav in her survey, but did not recall either in the interview. The other mother marked on her survey that Hurricane Isaac had “some impact”, but then articulated in her interview that the hurricane’s impacts were severe. Hurricane Rita, for all the mothers, was also in many ways seen as an extension of Hurricane Katrina. As such, the mothers, like the children, had a hard time distinguishing Rita from Katrina, and sometimes struggled to remember why they had marked it as a “major impact.” Most settled on their rationale had likely been that they were still displaced from Katrina, but few recalled specific or vivid details in the way they did for Katrina.

This recall inconsistency could be related to the different ways questions were asked in the surveys and interviews. The surveys asked participants to check off the impact a disaster had on their lives from a scale of one to five, with five indicating a “major impact” and one indicating “no impact”. Alternatively, the interviews first reminded participants of their responses on the WaTCH survey, asked them to describe their disaster experiences, and instructed them to explain why they gave the response they did on the survey, allowing them to articulate the levels of disaster impact using their own terms.

Time Gaps and Memory

Another possible reason for the discrepancies between the survey responses, where children were far more likely to indicate a “major impact”, and the interview responses, where they had a hard time recalling several of the disasters, is likely related to the time gap between the survey, the interview, and the event. Prior research has established that recall of traumatic memories decreases over time. For example, a study by Talarico and Rubin (2003) examined university students’ memories of the 9/11 terrorist attacks, testing students the day of the attacks and then 1, 6, and 32 weeks later. The study found that memory of the event declined with time, however, as time passed, the participants believed their memory was more accurate and vivid. Furthermore, a study by Peterson (2011) on children recruited from a hospital emergency room after getting injured, noted that while children’s recall accuracy of the event that caused the injury got worse with time, the amount of detail provided about the event increased with time.

While the current study cannot examine the amount of detail provided for consistency, since there was only one interview of each participant, similar to the above studies, it does suggest that there are inconsistencies between the wave 2 survey taken between 2015 and early 2016 and the interviews completed later in 2016; with seven of the nine children offering inconsistent answers and no child having recall inconsistency related to recollection problems of the most recent disaster, Hurricane Isaac. Moreover, nearly a decade passed between the disasters in question, with Katrina occurring in 2005 and Isaac in 2012, which undoubtedly further influenced memory.

Multiple Disasters and Memory

Two waves of research conducted in a study by Weems et al. (2014) tested post-disaster recall at four different time points. One wave of this study tested 9th to 11th grade children 13, 20,

and 26 months after Hurricane Katrina and once five months after Hurricane Gustav. The second wave of this study tested 4th to 8th graders two years after Katrina and one and eight months after Gustav. The study found that those who did not have a high negative exposure to Hurricane Gustav had more inconsistent recall of Hurricane Katrina. Weems and colleagues suggest that this could be because Hurricane Gustav did not cause as large of an impact, which may have provided a feeling of safety for participants, helping them forget the previous hurricane.

Similarly, the one mother participant who had not suffered a substantial impact from Hurricane Katrina, did not characterize the other disasters as being difficult. This mother also had trouble recalling the post-Katrina hurricanes, but could consistently recall and describe the impacts of the BP Oil Spill. As shown in Table 4, the most damaging hurricane for most of the participants, Hurricane Katrina, was also the disaster with the lowest levels of recall inconsistency for children (which is interesting, in that children were obviously the youngest age during that event). Further, the highest levels of recall inconsistency caused by issues remembering disasters in the interviews were for the two hurricanes that followed Katrina, Rita, and Gustav.

High Impact Disasters and Memory

A study by Fivush et al. (2004) interviewed 3 and 4-year-old children who experienced Hurricane Andrew regarding their disaster experience, interviewing them again six years later at the ages of 9 and 10. The study illustrated that children who had more direct and stressful experiences during Hurricane Andrew tended to have more consistent memory between the two interviews. Research by Kazui et al. (2000) on 34 adults with Alzheimer's disease and 10 adults without it gave participants two short stories that were identical, apart from for one being emotionally charged and the other being neutral. When asked to recall the stories, participants

were able to recall the emotionally charged story better than the neutral story, indicating that memory can be enhanced by emotional arousal.

Porter and Birti (2001) examined the types of emotional arousal that strengthen memory most by interviewing 306 people about their most traumatic and positive emotional experiences. This study found that while responses for both experiences were detailed, there was more detail, coherence, and vividness provided when participants discussed traumas. Additionally, a study conducted by Elliott (1997) on 724 randomly sampled individuals in the United States showed that there is a positive correlation between severity of a traumatic experiences and memory recall. A later study by Krinsley et al. (2003), which surveyed Vietnam era veterans at different times regarding traumatic events they experienced, echoed these findings. This study suggested that those events considered highly impactful on participants (based on the DSM-IV definition for PTSD Criterion A) were reported with more consistency than other traumatic events, indicating that high severity traumas are more likely to be consistently recalled. However, a study by Bahrack et al. (1998) found that increased severity of a traumatic event does not always improve memory for children between the ages of three and four. In this study, the child participants had better recall of the moderate severity traumas, than the low and high severity ones. This may imply that while experiencing traumatic events increases recall, events that are extremely traumatic can reduce recall.

In line with previous research, in the current study, the mother-child pairs who had the most traumatic stories in the interviews also provided the most detailed responses when asked to describe their experience during each disaster. Moreover, the only mother who had recall inconsistency resulting from an inability to remember disaster experiences during her interview had the least traumatic overall cumulative disaster experience, had a single, stable, short term

displacement, and had no major material or social losses in any disaster experience. Trends in recall consistency for children were harder to find, potentially because more than half the children were under the age of five at the onset of the first disaster experience. Age issues in the current study are discussed further in this chapter.

Recall Ability

Although not as frequent as recall inconsistency, problems recalling events occurred for all child participants in the current study. Five of the children had issues recalling an entire disaster experience and all nine had problems recalling certain aspects of the disasters. Similar to recall inconsistency, mothers reported inability to recall events at much lower rates than child participants, with only one mother being unable to recall an entire disaster and three mothers having some problems remembering certain aspects of the disasters.

Age and Memory

Several studies have reported issues with child recall, indicating that a child's age during a disaster and at the time of an interview/survey may influence recall ability. One study by Peterson, Warren, and Short (2011) asked 140 children between the ages of 4 and 13 to recall their three earliest memories, asking them to do the same thing two years later. The study found that as children got older, they were able to articulate their experiences better, however the accuracy of their recall declined with time. This study blamed infantile amnesia, also known as a lack of very early memories, as the reason for these findings. Additionally, Rubin (2000) pinpointed the average age in which memory fully develops at age seven and claimed that after age three children's memory becomes more consistent.

When exploring the interconnection between age, trauma, and memory, a study by Quas et al. (1999), examined the recall of 43 children between the ages of 3 and 13 who experienced a

medical procedure known as voiding cystourethrogram fluoroscopy when they were 2-6 years-old. This research indicated that children 4 years-old and older at the time of the procedure recalled the experience more accurately than younger children. Children under the age of 2 during the procedure had very little to no memory of it. Even though this study showed a clear pattern of better recall with increased age, this is not to say that older children's memories were always accurate, with one 5-year-old and one 7-year-old failing to recall the procedure. In a similar study, by Goodman et al. (1994), 46 children between the ages of 3 to 10 were interviewed regarding a stressful procedure. The interviews determined that the 3 and 4-year-old participants had less memory recall and accuracy than did older children. This study also implied that children's understanding of the medical procedure, as reported by their parents, influenced their memory, as children who understood the procedure made less memory recall errors.

Research conducted by Terr (1988) on 20 children's recall of trauma before age 5 argued that children who experienced a traumatic event before being 28 months old had trouble verbalizing their experience. When looking specifically at children's recall in disasters, Bahrick et al. (1998) conducted interviews on 100 children age 3-4 who experienced Hurricane Andrew. The study, conducted two to six months after the disaster, found that older children remembered and elaborated more than younger children, with children who were 4 years-old remembering much more than children who were 3 at the time of the storm.

Based on previous studies, it appears that children's memory is poor before the age of 3 and continues to strengthen in recall consistency and accuracy with increasing age. Examining the demographics of the current study, the children who were between the ages of five and seven at the time of Hurricane Katrina remembered more details about each disaster experience and remembered them more vividly than the children who were between the ages of two and four. In

fact, except for recall of Hurricane Isaac, which was the most recent disaster experienced, all of the children under age five during Hurricane Katrina had problems recalling at least one of the disasters. The only two children who had no recall problems were ages five and six during Katrina. However, the oldest child in this study, who was seven at the time of Katrina, had some recall issues. This study's patterns align with those of previous research and indicate that, although there is a clear trend toward better recall and memory with age, this trend was not exact in the present study.

Sampling and Interview Issues

In the current study, two of the mothers were related—mother and daughter—and another participant stated that her sister also participated in the WaTCH study. This suggests that even though the initial sampling relied primarily on an address based sampling frame, which was intended to provide a random sample of women and children in Southeast Louisiana, the use of family and friends to recruit some of the participants may have created some sampling bias. However, because this study is not intended to be generalizable, the use of mother-child pairs who were related actually provided a better understanding of the dynamics of the familial relationships and support of these four participants, allowing for a more thorough analysis of the disaster experiences.

As discussed earlier, the majority of participants' interviews were conducted privately, without the presence of family members. Nevertheless, six participants' interviews occurred while their families were in the same room. The presence of family members may have prompted some response bias for these participants. In these cases, participants may have modified their responses because they knew their family members were listening. Additionally, participants may have changed, added, and/or excluded information because of comments their family

members made during the interviews. The largest areas of discussion where changes in information may have taken place was regarding children's behavioral issues; however, we do not feel that this significantly influenced the overall interview accuracy and quality.

Overall, even with these limitations in mind, this is one of the first available studies on mothers and children who experienced three or more major disasters. Subsequent chapters focus on the importance of the findings that emerged from the qualitative work.

CHAPTER 3: THE EXPOSURE OUTLIERS

This chapter provides contextual information on each mother-child pair in the study. First, this chapter briefly describes each family. Second, this chapter examines literature on demographic factors, including age, gender, household composition, income, and race/ethnicity in relation to disaster coping and recovery, comparing the findings from the extant literature with the current study.

The Participants

This section introduces the mother-child pairs; while several family members are described in these brief introductions, the interviews and data discussed in the coming chapters focus solely on the mothers and the children who participated in the current research. The descriptions included below are to establish the broader context for the family; additional information is summarized in Tables 5 and 6.

The Smith Family

The Smith family consists of a mother, father, and two sons. The mother Sasha, was born in 1981, and had her son Alex in 2003 (the outlier child selected for the study) and Andrew in 2009. For the 2012 WaTCH survey, Sasha described her household as African American and low income, defined as making less than \$20,000 per year. During the 2016 interview, Sasha confirmed that her household was still low income and experiencing financial struggles.

In 2005, at the time of Hurricane Katrina, Sasha was unemployed, but her husband John was working full time at a manufacturing plant. By 2006, he lost his job because of Hurricane Katrina and the massive upheaval it caused. Both Sasha and John had difficulty maintaining full time and consistent employment between 2006 and 2014, leading John into criminal activities

including drug dealing, which resulted in his incarceration. Sasha divorced John in 2010. In 2014, Sasha obtained a full time and stable job, which she still currently holds. Sasha and John never reconciled and Sasha has been the primary provider and guardian of her children since 2010.

The Michaels Family

The Michaels family consists of a mother and three sons. Mia was born in 1979 and had her sons, Shane in 1995, Eric in 2001 (the outlier child selected for the study), and Joseph in 2007. Mia and her sons' father broke up early in 2005, before any hurricanes hit the Gulf Coast that season. Since 2005, Mia has been the primary guardian of her sons. Mia described her household on the 2012 WaTCH survey as being African American, with a household income between \$20,000 and \$50,000 per year.

Mia was working full time in 2005 at a hospital, but lost her job because of displacement from Hurricane Katrina. During displacement, she worked a couple of jobs and had some short periods of unemployment. After settling back in New Orleans in 2009, Mia attained other employment with the city, but lost it after a year due to the BP Oil Spill. She found another job soon after and has maintained stable employment since.

The Jackson Family

The Jackson family consists of mother, father, two daughters, and a son. Lacy was born in 1983 and had her daughter Leslie in 2000, her son Jason in 2003 (the outlier child selected for the study), and her daughter Veronica in 2005. For the 2012 WaTCH survey, Lacy identified her household as being African American, with a household income between \$20,000 and \$50,000 per year. However, in her 2016 interview Lacy explained that her income since 2010 has fluctuated, indicating that she currently considers herself as low income.

Lacy was unemployed during 2005 as a result of her pregnancy with Veronica, but her husband Peter was working full time; however, he lost his job because of Hurricane Katrina. Lacy ended up remaining out of work until 2007 when she secured a job at a juvenile detention facility. Unfortunately, she was injured at work in 2008 and was unemployed until she found temporary work on the BP Oil Spill clean-up in 2010. Later that year, Lacy acquired stable and full time employment as a caregiver. She worked at this job until 2012 when she quit because her employer was not paying her in a timely manner. In addition, in 2012, Lacy and Peter ended up divorcing, leaving Lacy as the sole provider for her children. Since 2012, Lacy has faced struggles finding a stable job and has endured many financial burdens.

The Allen Family

The Allen family consists of a mother, father, three daughters, and two sons. Susan was born in 1968 and had her three daughters, Lacy in 1983 (the previously introduced mother of another mother-child pair in this study), Delilah in 1995, and Heaven in 2003, and her two sons, Oliver in 1999 (the outlier child selected for the study) and Tyler in 2004. Susan described her household on the 2012 WaTCH survey as being African American, with a household income between \$20,000 and \$50,000 per year.

In 2005, Susan stayed home to care for her children while her husband Lucas worked full time. However, Lucas lost his job as a consequence of Hurricane Katrina. Both Susan and Lucas achieved stable employment in 2006 and maintained their jobs until 2010 when Lucas' job as a fisherman was temporarily halted because of the BP Oil Spill. While Susan indicated that her household was middle income in the 2012 survey, she further explained in her 2016 interview that her family had been facing financial struggles since 2005. This hardship became more severe in 2011, when Lucas passed away, leaving her as the sole provider and guardian for her

household. In 2014, Susan was working as an educator, but resigned in order to aid her daughter, Heaven, who was being bullied by her teacher in school. Soon after, Susan moved her daughter to a new school and, in 2015, found another job as a teacher.

The Johnson Family

The Johnson family consists of a mother, father, and three daughters. Christina was born in 1979 and had her daughter Jessica in 2002 (the outlier child selected for the study), Ramona in 2003, and Mariah in 2010. For the 2012 WaTCH survey, Christina described her household as being of “other” race/ethnicity, but in the 2016 interview, elucidated that both Christina and the children view themselves as mixed race. Further, in 2012, Christina marked their household income as being between \$20,000 and \$50,000 per year.

Christina has maintained stable employment since 2005, at times working up to three jobs. In 2008, Christina and her husband Omar divorced, partly because of their experience with Hurricane Gustav and Omar’s resultant drug use. Since 2008, Christina has been the sole provider and guardian for her children.

The Jones Family

The Jones family consists of mother, father, two daughters, and two sons. Sophia was born in 1963, she had her daughter Felicity in 1981, her two sons, Sam in 1988 and Martin in 1991, and her daughter Samantha in 1999 (the outlier child selected for the study). For the 2012 WaTCH survey, Sophia described her household as being African American with an income between \$20,000 to \$50,000 per year. In her 2016 interview she explained their household had been having financial problems since 2005.

Sophia and her husband Kyle were both employed in 2005, but due to Hurricane Katrina, Kyle’s job was temporarily halted for a few weeks and Sophia lost her job permanently. Kyle has

maintained the same job since 2005 and Sophia got a new job at Lowe's in 2006. She worked there until she had brain surgery in 2008, and, after taking a few months off to recover, she resumed her employment. Due to the BP Oil Spill in 2010, Sophia's work hours at Lowe's were cut, which added to her household's financial strain. Since 2010, Sophia has attained a job working in education. Kyle and Sophia are still married and continue to care for their children together.

The Bryant Family

The Bryant family consists of mother, daughter, and two sons. Natalie was born in 1975 and had her son Patrick in 1995, her daughter Miranda in 2000 (the outlier child selected for the study), and her son Leo in 2005. For the 2012 WaTCH survey Natalie stated that she was single and had never been married. During her 2016 interview, Natalie made no mention about any relationships she has had since 2005. Further, Natalie reported that she was unemployed in 2005 because of her pregnancy with Leo, but did not discuss whether she has had employment since. In the 2012 WaTCH survey, Natalie defined her household as being African American and low income, making under \$20,000 per year.

The Green Family

The Green family consists of a mother, father, son, and daughter. Jackie was born in 1965 and had her son Matthew in 1998 (the outlier child selected for the study) and her daughter Marsha in 2001. In the 2012 WaTCH survey, Jackie labeled her household as Caucasian with a relatively high income, defined as making \$50,000 or more per year. However, during the 2016 interview, Jackie described her household income as low, faulting the BP Oil Spill in 2010 for this decline, as it caused tourism loss at Jackie and her husband Richard's hotel business in Grand Isle, Jefferson Parish.

In 2005, both Jackie and Richard were employed, but due to Hurricane Katrina, Jackie permanently lost her job setting up corporate apartments and Richard was out of work selling cars for a few weeks. Jackie remained unemployed until 2008, when Richard quit his job and the Green family started a hotel business, which they are currently still running. As of 2016, Jackie and Richard are still married.

The Williams Family

The Williams family consists of a mother, father, three daughters, and a son. Daniela was born in 1962 and had her three daughters were born as follows: Alicia in 1980, Raven in 1981, and Maggie in 1992. She had her son Charlie in 2001 (the outlier child selected for the study). For the 2012 WaTCH survey, Daniela described her household as being African American, with a relatively high income of \$50,000 or more per year.

Daniela stated in her 2016 interview that she has not worked any paid jobs since 2005, but rather focused her time on taking care of her children and home. Her husband Bob is the sole earner for the household, maintaining a stable, full time job in the oil industry since before 2005. Rather than negatively impacting Bob's job, each disaster experience—particularly the Hurricanes in 2005 and the 2010 BP Oil Spill—increased his work hours, which temporarily boosted the household's income.

Tables 5 and 6 provide breakdowns of the demographic information for all mothers and children introduced above.

Table 5: Demographic Information for Mothers

| Name | Year Born | Race | Employment Status 2016 | Annual Household Income 2012 | Mother's Martial Status 2005 | Mother's Marital Status 2016 | Number of Children 2016 |
|-------------------|-----------|--------------------|---------------------------------------|------------------------------|-------------------------------------|-------------------------------|-------------------------|
| Sasha Smith | 1981 | African American | Employed Full Time Since 2014 | <\$20,000 | Married | Divorced – Now dating someone | 2 |
| Christina Johnson | 1979 | Other – Mixed Race | Employed Full Time Since 2005 | \$20-50,000 | Dating Children's Father on and off | Single | 3 |
| Mia Michaels | 1979 | African American | Employed Full Time Since 2010 | \$20-50,000 | Single | Single | 3 |
| Lacy Jackson | 1983 | African American | Unemployed Since 2012 | \$20-50,000 | Married | Divorced | 3 |
| Susan Allen | 1963 | African American | Employed Full Time Since 2015 | \$20-50,000 | Married | Widowed | 5 |
| Natalie Bryant | 1975 | African American | Currently Unknown/ Unemployed in 2005 | <\$20,000 | Single | Single | 3 |
| Jackie Green | 1965 | Caucasian | Self Employed Since 2008 | >\$50,000/ Year | Married | Married | 2 |
| Sophia Jones | 1953 | African American | Employed Full Time Since 2010 | \$20-50,000/ year | Married | Married | 4 |
| Daniela Williams | 1962 | African American | Stay at Home Mom/Wife | >\$50,000/ Year | Married | Married | 2 |

Table 6: Demographic Information for Child Participants

| Name | Year Born | Race | Gender |
|------------------|-----------|--------------------|--------|
| Alex Smith | 2003 | African American | Male |
| Jessica Johnson | 2002 | Other – Mixed Race | Female |
| Eric Michaels | 2001 | African American | Male |
| Jason Jackson | 2003 | African American | Male |
| Olive Allen | 1999 | African American | Male |
| Miranda Bryant | 2000 | African American | Female |
| Matthew Green | 1998 | Caucasian | Male |
| Samantha Jones | 1999 | African American | Female |
| Charlie Williams | 2001 | African American | Male |

Demographic Characteristics and Disaster Impacts

Demographic characteristics and family composition influence disaster impacts, coping, and recovery trajectories. The following section reviews prior literature by identifying patterns in

women and children's lives that play an important part in disaster vulnerability, resilience, and coping. While these characteristics will be examined separately in this section, it is critical to note that the combination of these factors often accumulate and influence post-disaster outcomes (Fothergill and Peek 2015). These intersections will be discussed in much greater detail in Chapters 4 and 5.

Children, Age, and Disaster

Several authors have argued that children and the elderly are more vulnerable to disasters than other age groups, not only because their age makes them more physically vulnerable to disasters' impacts, but also because of the educational, social support, and dependency on others that influence their ability to survive through a disaster and recover (Peek 2013). Reviews of the literature on children and disasters have highlighted the risk factors of family separation, bereavement, major community and home damage, parental distress, multiple life stressors, lack of social support, and/or high disaster exposure, emphasizing that these factors can increase children's chances of having behavioral problems and/or negative mental health outcomes, including, but not limited to, developing PTSD, anxiety, and/or depression (Saylor 1993). Further, these reviews found that psychological impairment increased for children who are female, low income, and/or racial and ethnic minorities (Norris et al. 2002; Peek 2008).

Aside from the negative impacts of disaster, studies have indicated that children also exhibit psychological resilience to these traumatic events (Jacobs and Harville 2015, Harville et al. 2010, Catani et al. 2010, Scheeringa 2014, Salloum et al. 2011, and Felix & Afifi 2015). For example, a study in post-Katrina New Orleans showed that adolescents, younger than age 16, experienced reduced chances of developing depression or PTSD. This research also found a link between feeling threatened by a disaster and having depression or PTSD. The authors explained

that younger children may not fully understand the gravity of the disaster and therefore benefit more from the protection of their parents, which reduces negative psychological outcomes (Jacobs and Harville 2015). Further, research has linked younger ages to better mental health after disaster and trauma exposures, both in the U.S. and internationally (Catani et al. 2010; Harville et al. 2010). See Table 7 for a detailed review of the literature.

Table 7: Studies on Age and Disasters

| Study | Location | Type of Trauma | Participants | Measures |
|------------------------|---------------------------|--|-------------------------------|--|
| Catani et al. 2010 | Sri Lanka | Tsunami, War & Family Violence | 1,398 Children (Age 9-15) | PTSD, Somatic Complaints, Psychosocial Functioning, & School Grades |
| Felix et al. 2015 | California USA | Wildfire | 50 Parent-Youth Dyads | Post Traumatic Growth, Perceived Fire Related Stress, Life Stressors, Mental Health Inventory, Protective Factors Survey, & Cognitive Emotion Regulation Questionnaire |
| Harville et al. 2010 | Southern Louisiana USA | Hurricanes Katrina & Gustav | 102 Mothers of Small Children | PTSD & Depression |
| Jacobs & Harville 2015 | Gulf of Mexico Region USA | One or more Disasters | 794 Women (Age 18-45) | PTSD & Depression |
| Salloum et al. 2010 | Louisiana USA | Hurricane, Katrina, Gustav & Community Violence | 122 children (Age 7-12) | Hurricane and Community Violence Experiences, PTSD, & Depression |
| Scheeringa 2014 | Louisiana USA | Hurricane Katrina & Other Life-Threatening DSM-Level Traumas | 284 Children (Age 3-6) | Oppositional Defiant Disorder, PTSD, Depression, Anxiety, & Attention-Deficit/Hyperactivity Disorder |

Children, Age, and the Exposure Outliers

In this study, it was the four oldest children, who were between the ages of five and seven during Hurricane Katrina in 2005, that recalled the disaster experiences best and noted long-lasting impacts in their interviews. The oldest child in this study, Matthew Green, for example, expressed that experiencing disasters has made him worry about the future. He is concerned that

his home could be damaged and his family would be forced to move permanently if another disaster struck. This is a great fear for Matthew, as he loved his home and had a strong attachment to it. However, Matthew also highlighted the positive impacts of the disaster exposures, stating that he reasoned that they made him more helpful and the evacuations helped him to make friends.

Oliver Allen, on the other hand, held that the disasters took his childhood away. He remembered worrying a lot and “losing [his] smile” during and after the traumatic events. Further, Oliver stated that the permanent displacement from his home in Plaquemines Parish following Hurricane Katrina had a lasting impact on him because he lost the place where he was loved and accepted. However, despite all the problems Oliver experienced, he also was able to discuss some benefits of the disasters, stating that they made him more prepared and mature, brought his family closer together, and made him, his family, and his city stronger.

Samantha Jones also discussed how the disasters both positively and negatively impacted her. Regarding negative impacts, she discussed being held back in school, losing opportunities, being split up from her family, and difficulties developing friendships. Alternatively, Samantha acknowledged that the disaster experiences taught her valuable lessons, explaining, “Well, I guess it taught me how to adapt, to places, to homes; movement from place to place.” Even with all the disaster-related challenges Samantha experienced, she was still able to excel in school, receiving a scholarship and becoming two-time valedictorian.

Similarly, Miranda Bryant claimed that Hurricane Katrina, in particular, had a long-lasting impact on her and the city alike, noting that New Orleans is still recovering and is dealing with an increased homeless population. In addition, she described how the disasters enhanced the emotional burden that her grandmother’s death placed on her. But Miranda listed some positives

of the disaster experiences in the interview as well, stating that they made her more mature, prepared, selfless, and independent.

The younger children, ages two to four during Hurricane Katrina, did not recall many negative effects of the disasters, regardless of the amount of exposure and hardships for their mothers and households. However, three out of the five did remember some positive outcomes. Jessica Johnson concluded that the disasters brought her family closer together, Jason Jackson, felt the disaster made him and the city stronger, and Charlie Williams explained that the disasters made him feel more prepared. Furthermore, the children in this study fared better overall regarding disaster coping and impacts than did their mothers, as they described less mental health problems, stress, and long lasting disaster impacts. These findings correspond with the previous research that found that younger age reduces vulnerability to the impacts of disasters. While this may be because of ability to recall the events, it may also be because the older children and adults better understood the threat the disasters posed in the short- and long-term, further intensifying the negative impacts.

Past studies have expressed that the negative effects of disasters are not only due to direct exposure, but are also related to other risk factors, such as loss and displacement (Adams, Hatum, and English 2009; Cox and Perry 2011; Crate and Nuttall 2016; Fussel and Lowe 2014; Kohn and Levav 1990; Pfefferbaum et al. 2016, Wadsworth, Santiago, and Einhorn 2009). While some of the younger children in this study did have multiple risk factors that accompanied the disaster exposures, including death of loved ones, family separation, multiple displacements, and school instability, age may have worked as a buffer, protecting these children from the potential negative impacts that occurred as a result. The older children did not seem to benefit from those same buffers. The two older children who described the largest negative effect of disaster

exposure, Samantha Jones and Oliver Allen, also discussed having multiple risk factors accompanying these exposures. Samantha Jones dealt with school instability, home destruction, family separation, and stigma during and after the disaster experiences, which made school adjustment and overall coping difficult for her. Oliver Allen moved over 10 times while displaced, dealt with the death of his father, family separation, and home destruction that led to permanent relocation outside of his home parish. This placed an emotional toll on him over time.

Gender and Household Composition

Examination of previous research on gender and disasters indicates that women are often more vulnerable to disasters than men, generally having higher death rates, more subsequent health problems, and more financial struggles (Baker and Cormier 2015; Enarson 2012). For example, Hunter et al. (2015) showed that women drowned at higher rates than men in the Indian Ocean Tsunami, largely because of cultural norms that create gendered differences in swimming capability. Further, Pyari and Ravindran (2016) illustrated how women were more prone to PTSD than men because of their role as caregivers. It is also well established that females are more likely than men to be poor, have higher risk of developing PTSD, live into older age and thus are more likely to become frail, have disabilities or mental illness, suffer domestic or sexual abuse, and be susceptible to health issues, adding to their vulnerability (Enarson 2012; Enarson, Fothergill, and Peek 2007; Gault, Hartmann, and Jones-DeWeever 2005).

Regarding single motherhood and disasters, research by Zahran et al. (2011) found that single mothers exposed to Hurricane Katrina and/or Rita had higher levels of stress, higher productivity losses, and worse mental health as compared to the general public. Unlike the general public, the mental health levels of these single mothers did not return to their pre-disaster levels. One of the reasons for the increased vulnerability of these women is the responsibility of

parenting and caregiving work. However, this study suggests that social support, education, and income helped buffer against worsening mental health outcomes for these mothers.

Women, regardless of race, class, marital status, or ethnicity, tend to do most of the parenting or caregiving work; these responsibilities can add extra burdens during disasters (Peek and Fothergill 2008). For example, a study after Hurricanes Katrina and Rita indicated that worsened mental health outcomes for mothers were linked to uncertainty about their children's safety (Lowe, Chan, and Rhodes 2011). Furthermore, even when married, during a disaster women are usually tasked with prepping for the event, locating resources and help, making evacuation decisions, and relocating the family. Thus, women often take on extra responsibilities before, during, and after disasters; this work load is made more difficult by single motherhood (Peek and Fothergill 2008; Tobin-Gurley, Peek, and Loomis 2010). Research on Hurricane Ike by Griffin (2009) illustrates this, demonstrating how partnered mothers had less trouble getting childcare and housing than single mothers, because of access to temporary housing, transportation to look for housing, and different ways of utilizing their social networks. Finally, because women often look to family and other social networks for caregiving responsibilities, when they are separated from these communities during and after a disaster, coping becomes much more difficult both financially and emotionally (Peek and Fothergill 2008).

Recent studies have shown that the intersection between minority race, low income, and single motherhood work together to make a person vulnerable to adversities. Disasters can enhance these vulnerabilities, making single, African American, low income mothers highly mentally, emotionally, and physically at risk to disasters (Tobin-Gurley 2008; Peek and Fothergill 2008). Research conducted by Weber and Messias (2012) indicated that women who were low income African Americans had worse overall health before and after Hurricane

Katrina, linking power relations to these outcomes. Additionally, disaster recovery was made particularly difficult for displaced, low income single mothers after Katrina because these women were unaware of available resources, faced emotional instability, lacked recovery funds and vital resources, had difficulty accessing aid, had multiple pressing needs, including insecure housing and employment, lost social support, and endured stigmatization and mistreatment due to their class, region of origin, race and/or household status (Enarson and Enarson 2012; Tobin-Gurley 2008). See Table 8 for a detailed review of the literature discussed in this section.

Table 8: Studies on Household Composition and Race in Disasters

| Study | Location | Type of Trauma | Participants | Measures |
|----------------------------|----------------------------------|------------------------------|--|--|
| Hunter et al. 2015 | Northern and Central Philippines | Flooding | 940 Rural Residence | Death Rates |
| Lowe et al. 2011 | Gulf Coast Region of USA | Hurricanes Katrina | 117 Low Income Mothers | Post-Disaster Psychological Distress & PTSD |
| Peek and Fothergill 2008 | Louisiana USA | Hurricane Katrina | 32 Children & 64 Adults | Interviews on Parents, Advocates, Kin Networks, & Place Attachment |
| Pyari and Ravindran (2016) | Tamil Nadu, India | 2004 Southeast Asian Tsunami | 485 Adults | PTSD |
| Tobin-Gurley 2008 | Colorado USA | Hurricane Katrina | 15 Disaster Relief Professionals & 8 Single Mothers | Interviews on Resources, Support, & Disaster Recovery |
| Weber et al. 2012 | Louisiana, USA | Hurricane Katrina | 32 front-line workers representing and 27 non-governmental, nonprofit community-based organization | Power relations and Health |
| Zahran et al. 2011 | USA | Hurricanes Katrina & Rita | Single Mothers & General Population in CDC BRFSS Database | Poor Mental Health Days & Mental Health Status |

Gender and the Exposure Outliers

While the current study does not examine the differences between males and females in terms of disaster vulnerability, it does help explain why women were the focus of the broader WaTCH cohort and of this specific exposure outlier qualitative study. Qualitative research

conducted on women in disasters can provide a more in depth understanding of how and why this group's disaster vulnerability is so high. This study did just this, as all of the women who were single were the sole or primary caregivers for their children and described how this role placed extra emotional and financial strain on them. The following section will describe the trends between single motherhood, worsened mental health, financial problems, and adversities for these women. How marital and parental statuses combined with race, class, types and severity of disaster impacts, losses, and health to influence disaster coping and recovery for these women is analyzed in Chapters 4 and 5.

Regarding mental health, only three of the nine mothers in this study said they had been diagnosed or treated for mental health issues, all of which are currently single and had divorced their spouses sometime after Hurricane Katrina. When examining finances, the highest income mothers were married during their 2016 interview, while the lowest income mothers and the mothers who described the most financial struggles since 2005 were single. All of the mothers who were not currently married indicated having multiple adversities on top of the disaster exposures, while none of the married mothers did. Finally, while all of the single mothers reported some financial burdens in their interviews, only Susan Allen discussed how the loss of her husband worsened her financial status, leaving her as the sole source of income and increasing her stress levels.

Irrespective of race, class, or marital status, all women in this study took on the majority of caregiving responsibilities during disasters. The two mothers who listed the highest incomes in their surveys and noted being married in their interviews, both had spouses who stayed behind and worked at paid employment during the hurricanes while they evacuated with the kids, taking on parenting responsibilities mostly alone during the evacuations and displacements. Further, in

all situations where mothers were separated from their children's fathers, they took on the primary caregiver role for their children. While this separation did impact mothers and children, this varied based on whether the separation was permanent or temporary. In the two cases where children were separated from their fathers temporarily, due to evacuation, there were no large impacts of the separation for either the mothers or children. Alternatively, when fathers left permanently, particularly because of divorce, arrest, and/or drug use, the separation negatively impacted both the mothers and children. In these cases, the mothers not only dealt with the financial and emotional burdens of single parenthood, they also were left to cope with the effects of the separation on their children.

In the case of Sasha Smith, her partner's arrest put both a financial and emotional strain on her, adding to her problems, which already included coping with multiple disasters, dealing with cancer, and experiencing financial struggles. In addition, Sasha stated that this separation helped drive her deeper into depression and was partially responsible for her son's anger issues. Similarly, Christina Johnson's separation from her partner, because of his drug use, increased her and her daughter Jessica's stress and forced Christina to face Hurricane Gustav alone, which made the disaster more emotionally and financially strenuous for both her and her daughter. Lacy Jackson's separation from her spouse added a financial burden on her and the Jackson family, left her frustrated over the lack of help he had provided, and made her youngest daughter emotionally distraught. Alternatively, Jackie Green and Daniela Williams, who were temporarily separated from their children's fathers during displacement, claimed that the separations had little impact on them and their children, as they knew they would be reunited soon.

Finally, though the current study was not large enough to conduct a comparison of social network changes between displaced single and married mothers, the findings regarding

transportation and housing for these single mothers corresponded with previous literature. Both Sasha Smith and Lacy Jackson, who are currently divorced, noted having transportation issues in their 2016 interviews, and Lacy also described having housing issues after the disasters, including becoming homeless for a time. None of the currently married women talked about housing or transportation issues in their interviews. Furthermore, all of the currently single mothers, with the exception of Susan Allen, discussed relying on family for some assistance during or after one or more of the disasters.

Income

There is a strong link between low levels of individual income and community affluence and disaster vulnerability (Bolin 2006; Cutter et al. 2003; Fothergill and Peek 2004; Kahn 2005; Mechanic and Tanner 2007). Having low wealth, low income, and low paying jobs prior to a disaster, increases the chances of financial devastation, income inequality, and job loss (Bui et al. 2014; Karim and Noy 2016). Moreover, since low income people are more likely to live in hazardous homes and locations and have higher chances of being renters, they are also more likely to lose their home and be forced to relocate (Fothergill and Peek 2004). This group is also less likely to have a location to move to, making them more likely to stay in mass shelters for longer periods of time. During Hurricanes Katrina and Rita, those forced to evacuate for the disasters, regardless of initial class status, had greater declines in income, which were felt most severely by lower income households (Yun and Waldorf 2016).

Low income people also have higher chances of lacking insurance, savings, transportation, and resources, causing them to wait longer to prepare and evacuate for a disaster and making repairs and relocation more difficult. Furthermore, difficulties navigating bureaucracies and receiving assistance, partially due to non-nuclear family structures, adds to

these difficulties (Farber 2007; Fothergill and Peek 2004; Masozera, Bailey, and Kerchner 2007). Finally, low income households report worrying about food and psychological disturbances after disasters more often than higher income households (Fothergill and Peek 2004; Subaiya et al. 2014). All of the above factors work to increase vulnerability, stress, and risk of developing psychological and emotional problems, especially when a person faces losses from the disaster and feels that these losses were not fairly compensated for (Fothergill and Peek 2004; Zahran et al. 2011). Table 9 provides further information on the studies discussed above.

Table 9: Studies on Income and Disasters

| Study | Location | Type of Trauma | Participants | Measures |
|----------------------|---------------|-------------------------------|---|---|
| Bui et al. 2014 | Vietnam | One Or More Natural Disasters | 9189 Households | Vietnam Household Living Standard Survey |
| Griffin 2009 | Texas USA | Hurricane Ike | 61 Adult Parents | Interviews on Social Capital & Disaster Experiences |
| Masozera et al. 2007 | Louisiana USA | Hurricane Katrina | All Listed City of New Orleans Residents | Geographic Information System & City Data Analysis |
| Subaiya et al. 2014 | New York USA | Hurricane Sandy | 208 Households | Interviews on Disaster Experiences & Recovery |
| Yun and Waldorf 2016 | Louisiana USA | Hurricanes Katrina & Rita | 35,492 Household Heads | Migratory Responses & Income Losses Post Disaster |
| Zahran et al. 2011 | Louisiana USA | Hurricanes Katrina & Rita | Single Mothers & General Population in CDC BRFSS Database | Poor Mental Health Days & Mental Health Status |

Income and the Exposure Outliers

In the current study, there were some clear disparities between the two families who had household annual incomes of \$50,000 or more a year and the other seven families who made less than this (in some cases, far less). The two mothers in the highest income households were also two of the three that were married and discussed having social support in their 2016 interviews.

In addition, the families of these two mothers both made some preparations before the disasters occurred, had places to evacuate to during the disasters, and showed some adaptive capacity post disaster. Further, throughout their disaster experiences, neither had been displaced for longer than four months, unlike six out of the seven other mothers who all had multiple displacements, with at least one lasting for a year or longer. The families of these higher income mothers did not face school instability, displacement to shelters, problems receiving assistance, stigma during displacement, problem pile ups, feeling unsafe in their neighborhoods, transportation problems, permanent relocation, permanent family separation, or mental health problems. Unlike all other families, they were the only two that did not discuss major home damage or loss. Finally, one of these two families, who also had a high income prior to the disaster exposures, was the only one to state that they had no disaster related financial struggles.

This is not meant to imply that the higher income families did not suffer loss or disruption because of the multiple disasters they experienced. Rather, it is to underscore that their higher income status, the presence of two wage-earning adults in their households, and other related factors helped to buffer them from the most serious effects of the disasters.

Race and Discrimination

While race and social class are highly interconnected, with higher percentages of minority races and ethnicities being of low income status as compared to whites, racial disparities in disaster impacts and recovery still exist when controlling for income (Fothergill et al. 1999). Several literature reviews and studies have tied disaster vulnerability to race, demonstrating how racial and ethnic minorities are less likely to evacuate during a disaster, are typically less versed in how to navigate bureaucratic systems, have more issues obtaining aid and recovering post disaster, are more likely to be displaced, injured, or killed during a disaster, have

longer displacement periods and slower recoveries, experiences higher declines in living conditions, and are more likely to have home damage and stay in temporary housing post disaster than their white counterparts (Bolin 2006; Cutter et al. 2003; Farber 2007; Fothergill, Maestas, and Darlington 1999; Fussell, Sastry, and Vanlandingham 2009). These trends were largely related to language, culture, housing patterns, quality of residential building construction, community structures, lack of social support, and historical and political racial and ethnic discrimination and marginalization.

Examining how these trends play out, Fothergill et al. (1999) found that in the United States, city recovery and relief services, such as the restoration of power and distribution of resources and aid, tend to disproportionately favor predominantly white areas over predominantly minority areas. Spring (2011) illustrated that after Hurricane Katrina, predominantly minority areas were less likely to be cleaned up or prepared for reconstruction, leading to slower recovery in these areas. Additionally, African Americans in New Orleans were more deeply dependent and connected to their social networks, making displacement and subsequent loss of those networks even more difficult (Peek and Fothergill 2008).

Research has also indicated that media can play a role in creating or enhancing racism and other forms of discrimination during and after disasters. During disasters, mass media tends to misrepresent and provide disproportional focus on disaster damage based on socio economic status, race, and ethnicity (Fothergill et al. 1999). This can and has shifted emergency response efforts towards wealthier white neighborhoods, which has in turn led to the neglect of the needs of minorities and low income people, who, as noted earlier, are often the most vulnerable to disasters. After Hurricane Katrina, the media was especially likely to portray African Americans as “looters” and “thugs” as opposed to deserving disaster victims (Gemenne 2010; Masquelier

2006; Tierney, Bevc, and Kuligowski 2006; Weems et al. 2007). Indeed, these negative media portrayals of New Orleans in the wake of Hurricane Katrina also influenced the highly-militarized emergency response efforts and left many of these survivors angry, depressed, and feeling discriminated against, adding to the lack of trust this group had toward the government (Tierney et al. 2006).

The media’s use of the term “refugee,” particularly when referring to low-income, African American New Orleanians during Hurricane Katrina, was also highly stigmatizing for this group (Gemenne 2010; Masquelier 2006; Tierney et al. 2006; Weems et al. 2007). This label left many feeling isolated and powerless. Other studies on the term refugee have demonstrated that, when accounting for other variables, the status of refugee was linked to increased mental health issues (Bonanno et al. 2010). Overall, discrimination, stigma, and racism, found during and after disasters, negatively impacts mental health, the ability to receive aid, and increases the chances of substance abuse and crime rates of those stigmatized (Mechanic and Tanner 2007). See Table 10 for more information about the studies discussed above.

Table 10: Studies on Race and Disasters

| Study | Location | Type of Trauma | Participants | Measures |
|------------------------|---------------|-------------------|--|--|
| Fussell et al. 2009 | Louisiana USA | Hurricane Katrina | 147 New Orleans Residents | Displacement & Return Migration to New Orleans After Hurricane Katrina |
| Peek & Fothergill 2008 | Louisiana USA | Hurricane Katrina | 32 children and 64 Children | Displacement and Parenting |
| Weems et al. 2007 | Louisiana USA | Hurricane Katrina | 386 New Orleans residents | PTSD Symptoms, Other Psychological Symptoms, Perceptions of Discrimination & Social Support, Evacuation Distance, & Experience of Hurricane-Related Stressful Events |
| Tierney et al. 2006 | USA | Hurricane Katrina | News Reports Between Aug. 29 & Sept. 11 2005 | Framing of News Reports |

Race and the Exposure Outliers

Of the nine mothers in the current study, seven of which are African American, four noted some form of discrimination during their displacement for Hurricane Katrina in their interviews. All four of these mothers are African American, had household salaries of less than \$50,000, and faced multiple forms of discrimination, including: dealing with racial discrimination, confronting stigma triggered by the label “refugee,” being treated as if they were “bad,” and battling discrimination based on city of origin. Similar to previous research linking mental health problems with discrimination, two of the three mothers who had mental health problems, in the form of depression and anxiety, discussed experiencing discrimination and stigma. Finally, one of the mothers, who was low income, African American, recalled how, after Hurricane Isaac, trash pick-up skipped her block for several days, which she attributed to the racial make-up of her overwhelmingly African American community. She ultimately called the news media, which led to focused attention and eventual action on the part of municipal services.

Two of the nine children, both African American, recalled encountering stigma; both describing being treated as if they were “defenseless” or “victims.” One of these children also stated confronting stigma caused from being New Orleanian and the other claimed that their stigma experience was also linked to the label of “refugee.” Overall, all four mother-child pairs who discussed stigma, explained how they felt uncomfortable, angry, and/or frustrated because of these experiences. All of these pairs also had an unstable, long term displacement for Hurricane Katrina, lasting at least a year, in which they moved several times and were separated from some of their family during their displacement. Additionally, these pairs faced financial struggles, residence loss, and health problems. These trends may indicate that certain situations

make a family more susceptible to discrimination post disaster; however, quantitative research is needed to generalize these trends.

This chapter briefly introduced the exposure outlier households and reviewed literature on age, gender, social class, and race in disaster contexts. This review was not meant to be exhaustive, but rather illustrative of the different demographic characteristics that influence post-disaster outcomes, both independently and in interaction with one another. The subsequent chapters delve into greater detail regarding the effects of cumulative disaster exposure.

CHAPTER 4: CUMULATIVE DISASTER EXPOSURE AND PROBLEM PILE UP

The following chapter examines the disaster histories of six of the nine mother-child pairs, describing their experiences from 2004 to 2016, and relating those experiences to the corresponding literature on disaster impacts, displacements, coping, and recovery. This chapter also describes how the demographic factors discussed in Chapter 3 interact with displacement and disaster losses to negatively influence families' abilities to cope and recover from cumulative disaster experiences.

The first section of this chapter discusses how material, social, and instrumental losses and displacement diminish disaster coping and recovery, illustrating the trends found in the current study. The next section describes the significance of Hurricane Katrina, as it generated the most losses and displacements for the participants of all the disasters. Finally, this chapter provides a detailed description of the six mother-child pairs and their family's experiences throughout the disaster exposures, demonstrating how problem pile ups occur and work to inhibit disaster coping and recovery. Since the current study participants' disaster experiences were deeply intertwined with those of their households/immediate families, Chapters 4 and 5 will refer to participants as families, rather than mother-child pairs for simplicity. However, the data presented is drawn from the interviews with the pairs.

Disaster Impacts

Several studies indicate that material, instrumental, and social losses, and displacement lengths, frequencies, and distances influence people's abilities to recover from and prepare for disasters (Black et al. 2013; Gray et al. 2014; Peacock, Dash, and Zhang 2007). The following

sections will examine previous studies on how and why this occurs and the patterns found in the current study.

Material and Instrumental Losses

Disasters, can often lead to home damage or loss. Low income persons and minorities have a disproportionately higher rate of home damage during a disaster, because of their higher risk of living in poorly built homes and dangerous neighborhoods that are more likely to face damage. Further these populations have higher chances of being renters, which also increases their risk of home damage and reduces the likelihood that they have private insurance to speed up recovery (Burby, Steinberg, and Basolo 2003; Fussel and Harris; Peacock et al. 2014b). Home damage or loss can lead to displacement, job loss, and financial strains, which is further exacerbated by the increases in renters, decreases in apartments, and raised housing prices and rents post disaster (Hori and Schafer 2009; Levine, Levine, and Esnard 2007; Peacock et al. 2007; Peacock et al 2014a). Lastly, home loss may create a loss of self, status, meaning, purpose, and cultural identity (Wadsworth, Santiago, and Einhorn 2009).

Examining job loss, studies have associated unemployment/job loss with mental health problems and downward social mobility (Bonanno et al. 2010; Samuels-Dennis 2006; Zottarelli 2008). In Hurricane Katrina specifically, low income persons, renters, African Americans, women, and those who relocated were more likely to lose their jobs and less likely to get a job after the hurricane (Zottarelli 2008). However, hurricanes are not the only type of disaster that impacts employment, as research on wave 1 of the WaTCH study found a connection between the 2010 BP Oil Spill, depression, and unemployment (Rung et al. 2017). Finally, job loss is deeply connected to financial loss, which also has negative impacts on people's coping capacities. Several studies have found patterns between financial resource loss and reduced

resilience, worsened mental and physical health, and increased distress and worry (Bonanno et al. 2010).

The current study sample is skewed toward homeowners, with seven families owning their homes during Hurricane Katrina. The two families who were renters both discussed severe financial problems and long, unstable displacements and recovery processes, which included staying in an emergency shelter and/or temporary housing. The mothers in these two families also discussed suffering from depression and/or anxiety.

In this study, home loss was strongly related to worse disaster experiences, with all seven households that had severe home damage or destruction indicating financial hardships after 2005 and stigma or discrimination during displacement. In contrast, the two wealthiest families, who were both homeowners, were the only two that did not face severe home damage or loss. The trends in disaster induced job, home, and property losses in the current study not only align with previous research but also speak to the emotional toll these losses can have, as all those who faced losses described how they added to their stresses and financial burdens. Table 11 provides more information about the studies discussed in this section.

Table 11: Information on Previous Material and Instrumental Loss Studies

| Study | Location | Type of Trauma | Participants | Measures |
|-------------------------|------------------------|---|--|---|
| Burby et al. 2003 | California & Louisiana | Hurricanes, Earthquakes, & Oil Refinery Disasters | Torrance, CA & New Orleans, LA Residence | Homeownership & Disaster Preparedness |
| Fussell and Harris 2014 | Louisiana | Hurricane Katrina | 402 Community College Students | Homeownership & Disaster Displacement |
| Hori and Schafer 2009 | Louisiana | Hurricanes Katrina & Rita | 5,556 Households in 18 LA Parishes | Displacement, Housing, Income/Employment, & Health |
| Peacock et al. 2014b | Texas & Florida | Hurricanes Andrew & Ike | Housing Data for 19,645 parcels | Long Term Trends in Housing Recovery |
| Rung et al. 2017 | Louisiana | 2010 BP Oil Spill | 2852 Women Ages 18-80 | Oil Spill Exposure, Social Capital & Support, Unemployment & Depression |
| Samuels-Dennis 2006 | United States | Any Stressful Events | 96 Single Mothers | Stressful Life Events, Employment & Depression |
| Wadsworth et al. 2009 | Louisiana | Hurricane Katrina | 93 Adult Survivors | Displacement, PTSD, & Depression |
| Zottarelli 2008 | Louisiana | Hurricane Katrina | 602 Red Cross Assistance Recipients | Employment Recovery & Location |

Displacement

Overall, displaced persons face a multitude of problems including homelessness, unemployment, separation from community and family, adaptive stresses, loss of privacy and property, marginalization, and negative mental and physical health impacts that make disaster coping and recovery more difficult (Crate and Nuttall 2016). The location, type, frequency, and length of displacement is linked to income and education, with poorer and less educated people having higher risks of displacement to a camp or shelter, rather than a private home or hotel, and longer displacement periods (Peacock et al. 2007).

Displacement is also associated with worsened health. Studies have established that displacement increases the risk of children developing PTSD, grief, disassociation, depression, psychological distress, anxiety, emotional disturbances, academic and behavioral problems, and

high levels of stress (Cox and Perry 2011; Pfefferbaum et a 2016). These negative health outcomes are connected to resource, job, and social support losses and unfamiliar surroundings that can make people feel isolated and lead to a loss of security, traditions, and comfort (Cox and Perry 2011; Fussell and Lowe 2014). Further, research has found that, for both children and adults, relocation/displacement, housing instability, displacement locations far from home, and prolonged resettlement and displacement periods are tied to impaired physical and mental health (Fussell and Lowe 2014; Pfefferbaum et al. 2016; Uscher-Pines 2008; Waters 2016).

In the current study, all participants were displaced for at least one disaster, with the length and location of the displacement varying between participants. All families stated that they evacuated for Hurricane Katrina/Rita, with about half discussing evacuations for Hurricanes Gustav and/or Isaac. Most of the families in this study also listed, in their interviews, that they stayed with loved ones or in a hotel during their evacuations. However, three families did discuss staying in emergency shelters and/or FEMA trailers.

Within all three families who stayed in emergency shelters or housing, the mothers were currently (in their 2016 interviews) single, African American, and making less than \$50,000 per year. These families also had two year or longer displacements and endured stigma during displacement, home destruction, separations from immediate family, and worsened financial statuses. Additionally, they had multiple displacements, with two of the three being displaced 10 or more times, more than any of the other families in the current study, and indicating in 2016, that they were still recovering from the 2005 hurricane season. The mothers in these three families described how difficult and uncomfortable the stays in shelters were, explaining that sleeping on hard floors or unstable cots, a lack of privacy, unsanitary conditions, and few hot meals were key problems with these locations. The stays in shelters also left the mothers of these

families feeling unsafe and stressed out, which may be why these mothers included the majority of those who reported, in their interviews, new or worsened depression and/or anxiety after Hurricane Katrina.

Displacement distance and length seemed to impact the nine families' abilities to cope and recover from the subsequent disaster experiences after Hurricane Katrina. In terms of distance, all families that had extensive damage to their homes, during any of the hurricanes, discussed how they changed displacement locations in an attempt to move closer and closer to their homes. This resettlement strategy was done in order to help speed up the recovery process. Sophia Jones articulated this approach to recovery, claiming,

See the whole point and the whole view everybody had, "Let's get in the spot which is closer to where you stayed so you won't need to hustle and bustle. We know you goin' to work. You go to work every day, like every second you had, you go back to that home and try to do a little something. It might be put up a nail, you did something. Everybody had a routine, everybody had goals, everybody, you know you had to get this done, everybody had a date.... The whole focus was that you was coming home eventually. So, let's put all our energy here.

Regarding displacement lengths, those who spent the most amount of time living in shelters, hotels, or with extended family faced more overcrowding, family turmoil, displeasure with residence locations, and a lack of privacy. These conditions made displacements and overall disaster experiences more difficult for these families. On the other hand, those who were able to move to an apartment or house within a year of displacement showed the most stable and short term displacements and recoveries. Finally, concerning times displaced, the five families who moved the most had the longest displacements and recovery periods of the nine households.

Children and Displacement

Studies on children have shown contradictory outcomes for children who are permanently and temporarily displaced, as opposed to those who resettle away from home. The

reason for these differences include presence of loved ones, school stability, location familiarity and attachment, cultural differences in displacement location, parent employment status, and displacement (Pfefferbaum et al. 2016; Scannell et al. 2016). Further, school destruction during disasters can displace children, disrupting academic progress, and potentially leading to worsened long term educational outcomes; this can be exacerbated when children are displaced to multiple schools and feel that the new schools are not welcoming to them (Fothergill and Peek 2015; Peek 2008).

In the current study, relocation took a toll on some of the children, with one of these children discussing severe issues in school adjustment and another describing the loss of acceptance, love, and safety that came with relocation outside of his home parish. Further, several study participants indicated that the educational system in New Orleans has worsened since 2005. The child who discussed problems with school adjustment also noted in her interview that readjusting to the schools in New Orleans was particularly difficult because of issues with teachers and peers. Three of the participating families had a child who was bullied by a teacher in school. One mother, who was a New Orleans teacher/mentor, also described a worsened educational system in New Orleans after Hurricane Katrina. Table 12 provides more information about the studies discussed in this section.

Table 12: Information on Previous Displacement Studies

| Study | Location | Type of Trauma | Participants | Measures |
|--------------------------|--------------------------|---------------------------|----------------------------------|--|
| Cox and Perry 2011 | British Columbia, Canada | 2003 McLure Forest Fire | 43 Participants & 250 North | Place, Identity, Social Capital, & Disaster Recovery |
| Fothergill and Peek 2015 | Louisiana | Hurricane Katrina | 7 New Orleans Children | Children's Pathways to Disaster Recovery |
| Fussell and Lowe 2014 | Louisiana | Hurricane Katrina | 392 Low Income Parents | Displacement, Distress, PTSD, & Perceived Stress |
| Gray et al. 2014 | Indonesia | 2004 Indian Ocean Tsunami | 22,390 Residents Age 15 or Older | Post Tsunami Mobility |
| Waters 2016 | Louisiana | Hurricane Katrina | 1,019 Community College Students | Physical & Mental Health, Economic & Social Functioning, & Neighborhood Attainment |

Social Losses

Displacement and Loss of Social Support

While social support can aid in disaster coping and recovery (discussed further below), loss of social support networks can impede it. Displacement during disasters, especially in cases where loss and community destruction is high, can lead to a loss of social support networks that negatively impact disaster coping and recovery and increase psychological distress (Lowe, Chan, and Rhodes 2010; Tuason, Carroll, and Guess 2012; Wadsworth et al. 2009). For example, during Hurricane Katrina, displacement left many unable to access family and community support, separating people from loved ones and taking away a protective factor against psychological problems (Weems et al. 2007). Moreover, parent-child separation was associated with increased feelings of fear, stress, anxiety, and/or other psychological issues for children, and increased stress and psychological problems for parents (Masten and Obradovic 2008).

Of the five women in the current study who did not perceive having social support, all indicated, within their interviews, that they received support from family, turning to family members for housing during displacement. Two of these mothers characterized their familial relationships as close knit, and three discussed evacuating with family members aside from spouses and children. However, two of these mothers also stated that they had issues while staying with family during displacement and four of them had difficulties with spouses during the disaster experiences, in all but one case leading to separation or divorce.

Three of the five mothers who did not perceive having social support asserted that, although they know there are people available for them to turn to, they could not access this support for one reason or another. One mother explained that she chooses to keep her problems to herself. Another described how she did not want to “burden” her family with her problems, as

they have their own problems to deal with, especially after all the disasters. A third woman elucidated that although her children provided her “a listening ear,” they are unable to provide her the “helping hand” that she viewed as social support. These patterns imply that even when social support was available for these mothers, the loss of some forms of support throughout the disaster experiences may have led them to perceive that they have no social support.

Disasters also created some family strain, with three of the families discussing how their evacuations to family member’s homes led to some family turmoil or arguments. One mother explained how her displacement to her brother’s house influenced his later divorce and how the strenuous recovery period after Hurricane Katrina caused increases in arguments between her and her husband. Three other mothers also described marital turmoil, and in these cases, a lack of help from their husbands during and after a disaster experience, along with other marital issues, that induced their divorce. Additionally, a couple of child participants had worsened disaster experiences because of their parents’ responses to a disaster, with one mother describing how her son took on her disaster related stress and one child discussing that seeing his father cry, after their house was destroyed, increased his devastation.

Examining temporary losses of social support, two of the children described the difficulty of being separated from close family during disaster displacement, with one of these children discussing how the displacement became longer and lonelier after the separation. Likewise, all mothers who were separated from family during or after a disaster articulated feeling distressed as a consequence of these separations.

Bereavement

Investigating permanent losses of social support brought about by death, studies have demonstrated that most people show resilience to interpersonal loss, with only about 10 to 15

percent of bereaved individuals showing signs of chronic depression or distress. However, when death is sudden and when there are multiple deaths, the negative impacts of bereavement can be larger, as these situations impact the grieving process, worsen mental health, lower social support, and create other stressors (Bonanno 2007; Goldman and Galea 2014; Kohn and Levay 1990; Rubonis and Bickman 1991). One study on Hurricane Katrina found that death of people a survivor knew was the most devastating part of the disaster experience, constantly reminding survivors of the disaster (Tuason et al. 2012).

Specifically examining the death of family, research has indicated that sudden deaths of loved ones can slow down recovery and impair mental health, increasing PTSD, MDD, psychological distress, and prolonged grief disorder (Johannesson et al. 2011; Kohn and Levay 1990; Kristensen and Heir 2012). Further, the negative psychological impacts of a disaster tend to be worse when the person was close to the deceased and when there are multiple known deceased persons (Harms et al. 2015). For example, a study on Hurricane Katrina implied that loss of loved ones is more strongly related to chronic grief than other forms of loss, however non-death losses, such as loss of job or home, can also create chronic grief (Shear et al. 2011).

Li et al. (2015) argue that it is not bereavement alone that causes psychological distress, but rather its combination with other factors. This study, along with several others, found links between attachment to the deceased, previous mental health problems, loss of employment, injury, other disaster related stressors, and terrifying disaster experiences (Li et al. 2015; Shear et al. 2011). These studies claim that the combination of these factors can increase the rates of complicated grief for bereaved disaster survivors. Lacking social support, being female, being a minority, and having low education levels has also been associated with worsened mental health for bereaved persons (Kohn and Levay 1990; Shear et al. 2011). Although sudden death is

connected to worsened coping and mental health, partially because of the loss of social support, some research has shown that having other forms of support, including cultural and/or religious supports, can help protect against these negative impacts (Kristensen and Heir 2012; Tirgari, Forouzi, Malakian 2016). Table 13 provides more information about the studies discussed in this section).

Table 13: Information on Previous Displacement Studies

| Study | Location | Type of Trauma | Participants | Measures |
|-------------------------|---------------------|----------------------------|-------------------------------|--|
| Harms et al. 2015 | Victoria, Australia | Black Saturday Brush Fires | 1,016 Participants | Loss & Severe Mental Illness |
| Johannesson et al. 2011 | Southeast Asia | 2004 Indian Tsunami | 245 Swedish Tsunami Survivors | Bereavement, Prolonged Grief, Psychological Distress, & PTSD |
| Li et al. 2015 | China | Sichuan Earthquake | 800 Bereaved Survivors | Complicated Grief, PTSD, Bereavement, Earthquake Exposure, & Intra/Interpersonal Factors |
| Lowe et al. 2010 | Gulf Coast of USA | Hurricane Katrina | 117 Low Income Mothers | Post-Disaster Psychological Distress & PTSD |
| Shear et al. 2011 | Louisiana, USA | Hurricane Katrina | 3,088 Residents | Complicated Grief & Bereavement |
| Tirgari et al. 2016 | Bam, Iran | Earthquake | 12 Survivors | Prolonged Grief & Bereavement |
| Tuason et al. 2012 | Louisiana, USA | Hurricane Katrina | 9 Adults Ages 20-59 | Displacement, Losses, & Secondary Stressors |
| Wadsworth et al. 2009 | Louisiana, USA | Hurricane Katrina | 93 Adults | Displacement, PTSD, & Depression |
| Weems et al. 2007 | Louisiana, USA | Hurricane Katrina | 386 New Orleans residents | Psychological Symptoms, Discrimination, Social Support, Evacuation Distance, & Other Stressors |

Permanent losses of social support were connected to worsened outcomes for mothers and children in the current study. All five mothers who reported, in their interviews, bereavement around the time of the disaster exposures also listed, in their interviews and surveys, being single, being African American, lacking social support, and having a pile up of problems, household annual incomes of less than \$50,000, Katrina displacements lasting a year or more, at least one long disaster recovery, and severe home damage or loss. Furthermore, all but one of these mothers described dealing with health problems and stigma and two of the three mothers

who had mental health problems were included in this group. Finally, unlike the mother participants, only one of the five bereaved children discussed the negative impacts of their loss. Despite these patterns, because bereavement questions were not asked by myself or Lori, unless initially mentioned without prompt by participants, it may be that those who were influenced most by the bereavements were the ones who discussed them.

Hurricane Katrina's Significance

The disaster experiences of the nine mother-child pairs in this study varied, however for most of the participants, Hurricane Katrina stood out in terms of the initial level of loss generated and the ongoing disruption that the disaster created. The following section will take a closer look at Hurricane Katrina, examining its significance for the study participants.

Hurricane Katrina displaced over a million people, with nearly half of New Orleans' population permanently relocated. African American, low income residents, a group with an already high risk of disaster vulnerability, experienced disproportionate effects in the disaster (Uscher-Pines 2008). The struggles in recovery for this group are largely associated with preexisting social and economic marginalization, limited resources for repairs, the distance evacuated, limited municipal services once returned to the city, and levee uncertainties in New Orleans.

Adams, Hatum, and English (2009) argued that the combined impacts of stress from struggles in recovery and losses of family, employment, community, along with permanent displacement of the most vulnerable populations led to "chronic disaster syndrome." This review also discussed studies on bereavement and physical and mental health problems post disaster, including the "Katrina cough" caused by dust after the hurricane. In regard to recovery, renters in New Orleans faced, long displacements, closure of affordable housing units, and a lack of public

assistance that made recovery more difficult. However, even homeowners and insured persons endured impediments to recovery, including raised insurance rates and mortgage payments. Finally, this review claims that, in 2009, four years after Katrina, New Orleans was still in a response phase, rather than recovering from the disaster. At that time, 38,000 residents were living in FEMA trailers, many houses and streets were still unrepaired, and several areas lacked home delivery mail services.

Of the nine mother-child pairs in this study, eight emphasized in their surveys that Hurricane Katrina had “major impact” on them and their households. When reflecting on Hurricane Katrina in comparison to the other disaster experiences, six mothers said, in their interviews, that it was the “worst disaster” they experienced. These mothers explained how Katrina caused complete devastation for them and their families and indicated that its impacts were long lasting and/or permanent. In their interviews, several mothers and children also discussed the impacts Hurricane Katrina had on the city of New Orleans as a whole. These participants claimed that the city and its residence were severely impacted by the hurricane and that some regions have still not recovered from this disaster. For example, Sophia Jones, who worked in the New Orleans school system, described the difficulties New Orleans children endured and issues with city disaster preparation and response,

What should have happened was every child, no if’s and’s or but’s, should have had a mandatory evacuation. This place is so crazy because the kids that lived in the Katrina are now the ones going crazy. There was no counselors, nobody, and social workers, those things. They really need to talk about some. They saw dead bodies. They saw so much. A human shouldn’t see, I mean bodies, they couldn’t take baths for weeks. They couldn’t eat. They was tired but they was people killing each other, people getting raped. They saw these, little babies saw these! Running around the street going crazy. So, I mean, it should have been done differently.

Finally, all participants who endured discrimination or stigma associated it with their Hurricane Katrina displacement. Table 14 illustrates the type and magnitude of the impacts this disaster

had on the nine families and the following sections of this paper will further explain why Hurricane Katrina was so significant for them.

Table 14: Hurricane Katrina Impacts on Mothers and Children

| Family | Displacement* Length | School Missed | Job Loss | Home Damage | Stigma | Family Separation** | Worst Disaster*** |
|----------|-------------------------|------------------|----------------|-----------------------------|--------|----------------------------------|----------------------|
| Smith | 2 Years | N/A | Yes- Father | Apartment Destroyed/Lost | Yes | Yes- Temporary & Permanent | Katrina |
| Johnson | 4 Days | N/A | No | None | No | No | BP |
| Michaels | 4 Years | Few Days | Yes- Mother | House Destroyed/Rebuilt | No | Yes- Permanent | Gustav |
| Jackson | 6 Years | N/A | Yes- Father | House Destroyed/Lost | Yes | Yes- Temporary | Katrina |
| Allen | 1.5 Years | 3-4 Months | Yes- Father | House Destroyed/Lost | Yes | Yes- Temporary | Katrina |
| Green | 2 Days | 3-4 Weeks | Yes- Mother | Minor Damage | No | No | BP |
| Bryant | 0.5 Years | Few Days | N/A | House Damaged/Rebuilt | No | No | Katrina |
| Jones | 7 Years | 3-4 Weeks | Yes- Mother | House Damaged/Rebuilt | Yes | Yes- Permanent | Katrina |
| Williams | 4 Months | Few Days | No | Minor Damage | No | Yes- Temporary | Katrina |

*Displacement starts at time of evacuation and ends when family moves back to the New Orleans area, staying in their own residence for at least one year.

**Any separation discussed by either mother or child during Hurricane Katrina, with permanent separations meaning a family member permanently moved away from the New Orleans area.

***As defined by mother in 2016 interview.

Participant Experiences

When a disaster strikes, its impacts and secondary stressors can make recovery more difficult. When a person is then exposed to more disasters or other forms of hardships, these influences may not only further slow disaster recovery, but can stop it completely, diminishing a person’s quality of life and leaving them overwhelmed with a multitude of problems. For example, a study on the BP Oil Spill and Hurricanes Katrina, Rita, Gustav, and Ike, found that fishermen who dealt with all these disasters faced a pile up of post disaster stressors, diminished resources to cope, and post disaster worry and fear generated by uncertainties about the future (Lyon et al. 2015). Taken together, these factors reduced fishermen’s quality of life and increased financial hardships. Similarly, persistent resource loss caused by disasters and an

inability to gain new resources can create a cycle of rapid resource loss, increasing vulnerability to additional loss and diminished prospects for disaster recovery (Abramson et al. 2014).

In the current study, six of the nine mothers described having a pile up of problems, created or amplified by the disaster experiences. All of these mothers' households made less than \$50,000 a year, had one or more long, unstable displacements, lasting at least a year, had financial difficulties since 2005, had major home damage or loss in at least one disaster, and had disaster related health problems within their households. Further, all but one of the mothers in these families were African American, had a year or longer recovery periods, were single, had jobs impacted by one or more of the disaster, encountered family separation, and discussed their limited levels of social support. Additionally, all but two of these families experienced the death of one or more loved ones in the period following one of the major disasters they experienced. Finally, this group included the majority of families who encountered stigma and all of the mothers who listed having mental health problems on their interviews.

The following subsections will present the six mother-child pairs who faced problem pile ups and their disaster experiences. These subsections seek to demonstrate how different factors combine to negatively influence disaster coping and recovery. After each family's story, there is a map (shown as Figures 11-16) to help visualize the various places each household moved. I created an impact severity score for the various locations based on the disaster impact maps shown in Figures 1-10.

The Smith Family

When Hurricane Katrina happened in 2005, Sasha Smith was battling cancer, dealing with the loss of her grandmother who had passed away the previous year, recovering from surgery for a broken neck, and taking care of her two-year-old son, Alex. Although Sasha had

help from her partner, Alex's father, John, it was a difficult time in her life. Because of the cancer, Sasha was unable to work, so money was very tight for the Smith family when the hurricane made landfall. Hurricane Katrina exacerbated Sasha's current problems, adding to financial strains, as her husband John lost his job as a result of the disaster and the Smith family lost their apartment and most of their property. Recalling the experience Sasha shared,

I was dealing with cancer, with the loss of my grandma, plus the other surgery I had just had from the broken neck. I had to wear the halo (laughter) where the poles come and that. And so then, bam, here came Katrina, so I was like, every time I would be getting over something, something else was always happening in my life, where the depression never left. Up to this day, I still suffer badly. A low depression but more anxiety than ever in my life.

Prior to the hurricane, and largely because of a previous hurricane scare, the family was not worried about the storm. Fortunately, they still decided to evacuate, heading from their first-floor apartment in Orleans Parish to the Superdome in downtown New Orleans—the refuge of last resort. While Alex, the outlier child, was only two years old at the time, the images of the crowded Superdome and excess water remain with him until today. Soon after the family escaped those squalid conditions in the Superdome, they traveled to Georgia to John's father's house. Feeling unwelcome and with Hurricane Rita on the way, the Smith family headed to Alexandria, Louisiana. During the evacuation for Hurricanes Katrina and Rita, the Smith family was separated from both John and Sasha's mothers; this was significant as these women had been a substantial source of support before the storm.

In Alexandria, Louisiana, the family faced racism and stayed in an unmaintained hotel, as they waited for Hurricane Rita to pass. Although the Smith family did not directly experience Hurricane Rita, it increased the time they were displaced, which is why Sasha marked it on the WaTCH survey as having a major impact on her and her household. From Alexandria, the Smith family went to Houston, Texas, where, to Sasha's relief, she was reunited with the rest of her

family. However, while in Houston, Sasha felt stigma toward her as a Katrina survivor from New Orleans and was, to her dismay, treated like a “refugee.”

The family stayed in Houston for two years. They returned to Orleans Parish in 2007, after they found an apartment. At this time, Sasha was expecting another child and was fully recovered from surgery, but still battling cancer. Overall, the Smith family had begun to recover, but was still struggling financially. If the Smith family’s disaster experiences had ended there, they may have been able to achieve full recovery, here defined as a return to routine, stability, and predictability (Fothergill and Peek 2015). But that was not where their story ended. In 2008, Hurricane Gustav hit, diminishing the Smith family’s income, causing job loss, shutting down Alex’s school, and forcing the family to flee to a hotel for a few days. Alex, now 5 years old, recalled the uncomfortable conditions, evoked by a lack of electricity and water, during and directly after the hurricane.

A few weeks after Hurricane Gustav, the Smith family moved to a house in Kenner, Jefferson Parish. However, the problems caused by the two hurricanes were still unfolding. Sasha had a miscarriage; she believed it was because of hurricane related mold and debris in her home. A handful of months after the miscarriage, Sasha became pregnant again and ended up having her youngest son, Andrew. Andrew was born with heart problems, adding to Sasha’s list of concerns, and leading her into a depression.

Sasha and her children were forced to move again in 2010 to New Orleans East, as John, unable to hold a steady job after Hurricane Katrina, got arrested for selling drugs. This situation added to other stressors, deepening Sasha’s depression. The separation from his father and the hurricane experiences also took a toll on Alex, causing him to have “anger issues.” Additionally, the BP Oil Spill occurred around this time and, although it was less detrimental to their family

than the hurricanes, it forced the Smith family to exclude seafood from their diets and further disrupted the city where they had returned hoping to make a living.

In 2012, now a single mother of two children, still fighting cancer, dealing with her youngest son Andrew's health problems, and financially struggling, Hurricane Isaac made landfall. This hurricane severely damaged the family's home, caused curfews to be implemented around the city, and temporarily left the family with little access to food, water, or air conditioning. Reflecting on the experience, Sasha indicated that the government was "unfair" after Hurricane Katrina, Hurricane Isaac, and the BP Oil Spill, underpaying those impacted, including herself.

While Sasha has been able to stabilize her life and mostly recover, things did not start getting better for her and her family until 2014, nine years after Hurricane Katrina, when she and her son's medical problems got better, she entered into a new romantic relationship, she secured a stable and full-time job, and she made progress to buy her current residence. Moreover, after John was released from prison, he moved to Texas to be near his family. Despite still physically being separated from his children, they were now able to visit and deal more directly with Alex's "anger issues" and school problems.

However, Sasha never fully recovered economically from her experiences, still facing financial troubles and lacking a vehicle to get around in 2016. Sasha noted some discontent with her living situation during her interview, discussing worries about local violence and crime and speaking at length about her struggle to keep her sons out of trouble and away from the violence in the park near their neighborhood. Looking back at her experience over the past decade, Sasha said,

I think it's more like, when you finally get settled in to making a way for you and your kids, here comes something bad. Even if it's not a storm, just the murder that's going on

down here, just the violence that trying to keep your kids, especially boys, away from things like that, it's kinda hard, especially when you're a single mom.

In spite of this, Sasha felt that she is more prepared if another disaster strikes, stating that patience, being “a giver,” and having all paperwork and necessities prepared for an evacuation is key to survival. She also claimed that even though she has no desire to leave New Orleans, another hurricane may be “a sign from God” not to come back to the area. Alex took a different lesson out of the multiple disaster experiences, stating that “listening to your parents” is extremely important when facing a disaster.

Sasha and Alex's story demonstrates how the combination of health problems, bereavement, divorce, multiple disaster exposures, discrimination, financial problems, and job and home losses can restrict a person's ability to recover from disasters; as these issues can enhance one another, making them harder to overcome. For example, Sasha and Andrew's health problems left Sasha unemployed and made the household's financial problems more difficult, worsening Sasha's mental health, which, as previous studies discussed have indicated, can further worsen physical health (see Waters 2016). In turn, physical health issues can increase financial struggles and make finding and maintaining employment difficult. Taken together, this compounding of problems slowed Sasha and her family's ability recovery in some aspects of life and prevented them from becoming fully financially stable.

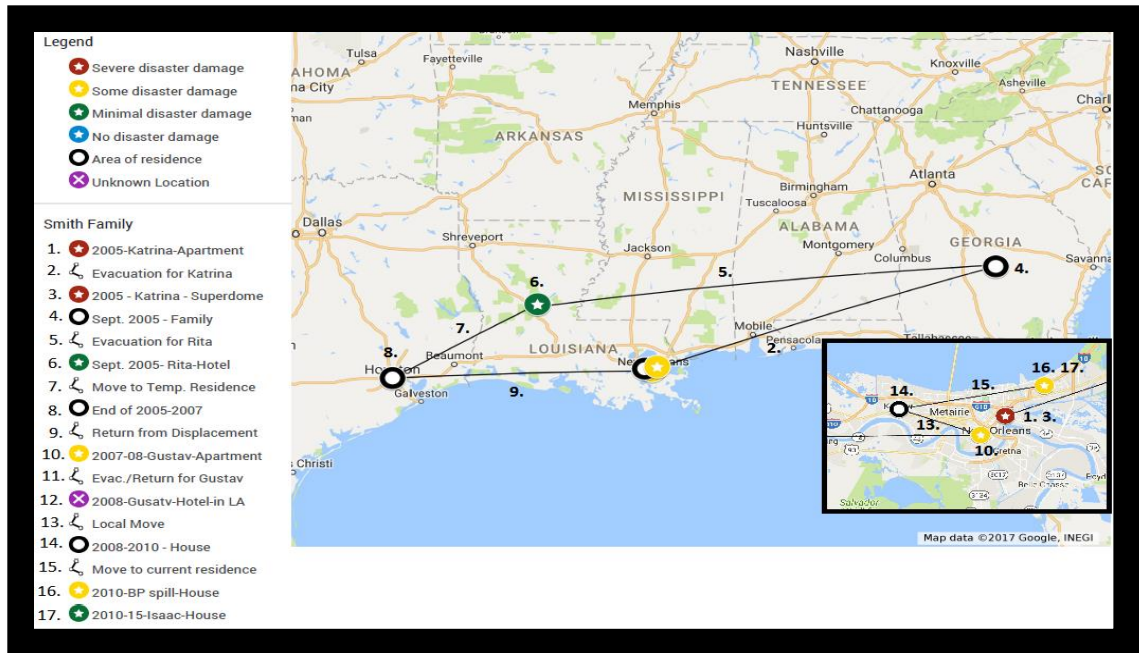


Figure 11: Residence and Evacuation Locations of the Smith Family 2005-2016

The Michaels Family

Before Hurricane Katrina, the Michaels family was dealing with multiple chronic health issues, as Mia was diabetic, her son had asthma, and her parents and grandmother suffered from multiple health problems, which increased Mia’s worries during each disaster. Further, in 2005, Mia and her son’s father divorced, leaving Mia with the responsibility of raising two children alone. When Hurricane Katrina struck the Gulf Coast, the Michaels family evacuated with the belief that the storm would not be very bad, as the previous “big” storm to hit the region did not do much damage. Mia left her new job at a hospital and the Michaels family left their house in the Upper Ninth Ward and traveled to Meridian, Mississippi, where they got a hotel room. The family tried to wait out the storm in the hotel, however the storm passed the area they had fled to and led to power outages in the area. Soon after, Mia and her family headed to Orlando, Florida to stay with her cousin.

Once out of harm's way and realizing the damage that Hurricane Katrina had done, Mia began to worry for her neighbors and became frustrated over the lack of help the city was receiving. During this time, Eric, the outlier child, recalled observing his family as they worriedly watched the news reports about Hurricane Katrina; but, having been only four years old, Eric does not remember much else about the hurricanes and displacement. After a few days in Florida, the Michaels family went to a hotel in Richland, Mississippi for several weeks, avoiding the destructive force of Hurricane Rita. They stayed in the hotel until they got an apartment in the area and Mia, after losing her hospital job because of the displacement, found a job at a bookstore.

Throughout their displacement, Mia's children were only out of school for a few days, but, as Mia noted in her interview, had taken on the stress their mother was carrying over the destruction of their home and their displacement. While in Mississippi, Mia avoided visiting her house for months because she was scared to see the destruction, staying back with her sick grandmother while her family visited New Orleans. When she finally went back to see the area and the damage to her home, the unusual quietness, the severe damage to her home and property, and the knowledge that her neighbor died during Hurricane Katrina left her overwhelmed.

The Michaels family stayed in Mississippi for the school year, in order to be closer to home and to minimize school disruption. In September 2006, trying to get even closer to home, they moved to Baton Rouge, in East Baton Rouge Parish. At the end of 2007, after settling in East Baton Rouge Parish with her family, Mia had another child. Before giving birth, she became sick and was hospitalized.

A few months later Hurricane Gustav occurred, leaving the family with no electricity and facing extreme rain and heat for a handful of days. Eric, now 7, recalls watching the excessive

rain pour down during the hurricane. The storm left Mia worried for her older son and grandmother's health, and to her dismay, her grandmother passed away right after the hurricane. Coming home to no electricity after her grandmother's funeral, Mia recalled feeling as though the hurricane had never ended. This was soon followed by Mia having a miscarriage and her uncle dying. The multiple deaths and disasters left Mia in a constant state of grief, "just going through the motions." Comparing the other disaster experiences to Hurricane Gustav, Mia stated,

But because mostly it was, it was the family, we stayed the same, you know, it was all of us together, that was basically what the dynamic was. It was family; it was all of us together. When we moved, from Mississippi to Baton Rouge area, everything was still the same. It was difficult when we moved from Baton Rouge to here, because my grandmother had just passed, my grandmother died in '08, September '08 right after umm.

In 2009, after four years of displacement, the family moved back to their home in Orleans Parish and Mia soon found a job. She recalled a "Katrina effect" after coming back home, in which there was a smell, particularly after it rained, because of the boarded-up houses and chemicals the city put on the grass, that, she believed, induced Eric's allergies. Furthermore, soon after moving back to New Orleans, Eric had trouble making friends and experienced bullying by his teacher, which lasted two years. Although Eric and his family were close and discussed almost everything with one another, Eric did not tell his mother about the bullying during the time. Once he did, she switched him to a different school.

In 2010, a year and a half after moving back to Orleans Parish, the BP Oil Spill happened, causing Mia to lose her job. Money became tight, but Mia's sister helped her budget. The stress of losing the job and knowledge that it was caused by the oil spill created anxiety for Mia, causing her to descend into depression and exacerbating her diabetes and high blood pressure.

In 2012, right after Mia's sister had moved into Mia's home with her newborn baby, Hurricane Isaac hit. The Michaels did not evacuate for the hurricane and hence faced electricity outages and unbearable heat. This chain of events worsened Mia's oldest son's asthma, her and her mother's diabetes, and caused her younger children to get nose bleeds; these worsened health problems worried Mia. Eric recalled watching the rain pour down and fearing the thunder during the hurricane. He also felt inconvenienced by the electricity outage during the storm, but was amused by the cheering that commenced in his neighborhood when the electricity came back on.

In her 2016 interview, Mia described her love for New Orleans and her desire for her children to grow up there. However, she claimed that, if another storm strikes, she will leave permanently, because the combination of disasters and violence in the city has left her worried for her children's safety. Those worries are only amplified by other challenges like rising opioid use, the changing demographics in her neighborhood and city, and increased rental and living costs. While Mia's living conditions have stabilized at the time of our interview, her health had worsened since 2005, as she has now developed kidney problems. Recounting the past 11 years, Mia articulated,

It feels like, when you've got to get, I was, I was in a situation where I felt like we were good, we were in a good place and you can grow; and every time I feel like, it's like every time I feel like that, something happens, something else happens, something else happens, something else happens. So, you can't get into a place where you just like, you know what, growth, I'm growing, these kids are growing, everybody is good, everybody is happy. It's like you can't never really get stable because of all of that that's going on, so...

Mia observed that going through disasters can help some people, including her neighbor, who got off drugs, and her children, who learned to adapt and cope with such events. Although, she was resolute that being exposed to disaster did not benefit her. Her wish was that her children could grow up in the environment that she did; Mia grew up in the same tight knit neighborhood

her whole life, but after Hurricane Katrina the dynamics of the area permanently changed. Mia advised that letting children know they are loved is key for getting through a disaster.

Alternatively, Eric believed that God has and will continue to protect him and his loved ones through any disaster and stated that preparing an emergency pack is key to disaster survival.

While both Mia Michaels and Sasha Smith had a pile up of problems and similar types of adversities, the ways in which these problems worked together to impede disaster recovery and coping were starkly different. Sasha's problems built on one another much more than Mia's problems did, particularly in terms of health problems impacting finances and employment. What most deeply impacted Mia was not the financial issues, single mother status, home and job losses, or displacements, although these issues did effect Mia and her family's coping and recovery; instead, it was the multiple deaths and health problems, made worse by the multiple disasters, that was hardest to cope with and recover from.

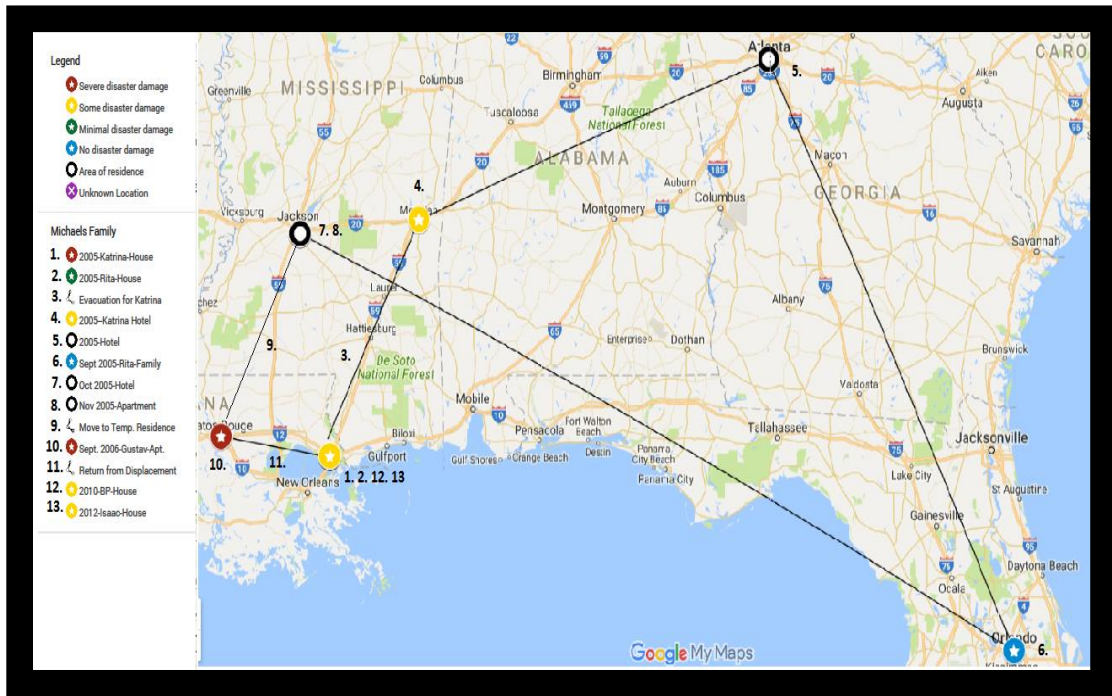


Figure 12: Residence and Evacuation Locations of the Michaels Family 2005-2016

The Jackson Family

Lacy was living in a split-level home in Plaquemines Parish and had just had her third child, Veronica, when Hurricane Katrina laid waste to the Gulf Coast in 2005. Although Jason, the focal child, was only two years old during the Hurricane, he remembered the news reports of the impending disaster. Financially struggling, Lacy recalled desperately fighting to get their money out of a broken ATM machine so that they could afford the evacuation. Lacy, her three children, their father, and some of his family evacuated to a hotel in Hattiesburg, Mississippi. In Hattiesburg, they were forced to swap hotels twice and ended up riding out the storm in a substandard hotel that lacked water and electricity. These conditions worsened Lacy's two oldest children's asthma and eczema, leaving Lacy concerned for her children's health.

A couple of days after the storm, the Jackson family left the hotel for a shelter in Baton Rouge; they stayed there for a month and a half, largely avoiding the impacts of Hurricane Rita. In the shelter, they slept on the floor, had cold water to shower in, seldom had hot meals, learned of incidents of rape within the shelter, and lived in an overall inhospitable environment. The disaster and displacement experiences thus far boosted Lacy's stress levels, preventing her from producing breast milk to feed her newborn child, Veronica. This caused Veronica to become sick, as the scarce supplies in the shelters and hot, humid conditions diminished the availability of formula and milk. Lacy described this dreadful experience in vivid detail and as if it were yesterday, even though more than 10 years had now past,

They [the shelter] had a little clinic where people could be seen, but they had a lot of elderly people. You had a lot of people who really, really needed care. They used to have a line wrapped around the gym where I guess the doctor's office was set up. But they didn't have stethoscopes, thermometers. They were waiting on those to be shipped in or flown in by whoever, so they couldn't check to see if you had a temperature. And my baby [Veronica], it had gotten to the point where I would take bread, and I would chew bread up until it got real, real wet inside, and I would just feed her the bread, because I didn't know what else to give her. You know, she was a little baby. So, she ended up

getting sick. She had a lot a gas. They didn't have any drops, gas-relief drops or anything. So, I would stand in a line every day, with her, just so they can check her, because she wasn't sleeping...

But milk did, finally did come, which was like a week or so later, when milk did come, when she first got on the milk, she started, she was real sick because she hadn't been having her milk for so long. So, when I would go stand in the line with her, the people would hear her screaming, even the elderly people, and they would always tell me to go to the front of the line, but every time I would go to the front of the line, there was nothing they could do for her. You know, they would try they best. The had like Tylenol or something like that to help cope with the pain she was having, stomach pains from hunger; Anything, because there was nothing they could do.... As time went on, they started getting little things. And everything they got for a baby, the doctor ended up making me a basket. So, he made me a basket with all kinds of baby stuff. And he was telling me he appreciated my patience for waiting with them. I told him, I had no choice. I mean, there was nothing else I could do. It's not like I could go anywhere or get anything...

After leaving Baton Rouge, the Jackson family went to San Antonio, Texas, where FEMA covered their hotel stay and then they headed to Lacy's husband's family in Houston. By this time, Lacy was separated from her mother and oldest child, Leslie, for a couple of months and did not have any means of contacting them. After settling in Houston, Lacy went back to New Orleans to find the complete destruction of her home and property. Lacy contended that, even though her family did not directly experience Hurricane Rita, because of their location in Texas, Hurricane Rita destroyed everything that Katrina had left behind. Further, despite the extensive damage to Lacy's home, due to the construction and sharing of her home with her parents, Lacy received little aid from FEMA for the damages and they ended up making her pay back more than they had given her. In her interview, Lacy recalled how she and other New Orleanians were treated badly by the military, news media, and Texans during displacement. She also observed that Katrina not only devastated her home and family, it impacted the city at large, creating sinkholes throughout the area.

In early 2006, after having stayed in Houston for a few months, Lacy moved into a travel trailer in Plaquemines Parish, where she was reunited with her mother and oldest child Leslie.

Within a few months after moving, things took a turn for the worse. Lacy recalled,

My baby girl [Veronica] had gotten ran over by a car. Actually, her dad ran her over with my car. She's still living, but she was thirteen months old. So, I ended up staying in the hospital with her a month and a week for her to recover and go through everything that she went through.

In the process of me staying in there, my FEMA trailer was contaminated with formaldehyde. So, by me going back and forth and seeing my baby, I don't know, by them running tests on her, it came up on her or in her system, or something. So, the doctor told me I could no longer go back to my travel trailer and they would set me up a room in the hospital; he did this against hospital orders. I had a room there where I slept, but I was traveling back and forth to go see my baby before I had a room. When he told me the trailer was contaminated, he wrote out paperwork and everything.

When my daughter came home, I was going to need a handicap accessible trailer. All of that, I submitted it to FEMA. FEMA refused to give me, they had half-sized travel trailers, FEMA refused to give me the half-sized travel trailers which are handicap accessible. They also refused to give me another travel trailer. They wanted me, well I'm not going to say they wanted me, they made me live in that trailer. So, when my baby came home and she recovered from the hospital, I lived in that trailer, but I only lived in there maybe two weeks.

After leaving the FEMA trailer, the Jackson family went to Lacy's grandmother's house in Algiers, Orleans Parish. The family stayed there for three weeks, and, at the end of 2006, they moved to Georgia, because of a Fannie May housing program Lacy was enrolled in.

Lacy got work in Georgia at a juvenile correctional facility and, once she was settled down, her oldest daughter Leslie, who was continuing to be raised by Lacy's mother, came to permanently live with her. At this point, Lacy had been separated from her eldest daughter for six years, since Leslie was born in 2000. Lacy's mother and father had been raising Leslie, as Lacy was so young when she had her first daughter, but then the disasters further delayed her reunification with her child.

In 2008, about a year and a half after moving to Georgia, Lacy was injured at her job, forcing her to have spine surgery and become unemployed; all of this left Lacy and her children severely financially burdened. Lacy descended into a deep depression. That same year, and soon after Lacy's work-related injury and surgery, Hurricane Gustav made landfall. While the storm did not damage her residence, her entire family evacuated New Orleans to her house for a few weeks. Remembering this time, Lacy stated that her family brought the disaster to her, but she also noted that the only impact on her was a crowded home and more financial strain.

In 2009, at the end of her lease in the Georgia apartment, Lacy and her family came back to New Orleans, stayed in a hotel for a few weeks, then moved to public housing. Still dealing with her back issues, Lacy was unable to work and, within some months, ran out of worker's compensation and was evicted from public housing. At the time, Lacy's back pain was very bad and she had wished that she could turn to her mother for help, but knew that her mother had burdens of her own; so, she suffered in silence. With nowhere to go, the Jackson family headed to Warner Robbins, Georgia and stayed with Lacy's friend for a month.

In 2010, nearly five years after Hurricane Katrina, Lacy came back to Louisiana permanently. When she first moved back, Lacy was homeless. The Jackson family stayed at a shelter for a month and then with an extended family member for several more months. During this time, the BP Oil Spill transpired and Lacy, now partially recovered from her back surgery and in desperate need of money, began working on the oil spill cleanup. The job lasted 2-3 months and Lacy had to work long shifts, barely seeing her children, was underpaid, and became sick with temporary rashes and permanent eye problems; at the time of her interview, Lacy was involved in an active law suit against BP. Jason reminisced about the absence of his parents at

this time, because of their work on the oil spill, and that putrid smell of the oil that would come sporadically.

Despite the negative impacts the oil cleanup work had on Lacy, the income from the job, along with receiving public assistance and acquiring a new, stable job as a caregiver directly after the oil spill work's completion, provided Lacy a sufficient amount of money to get her own apartment in Gretna, Jefferson Parish. This apartment, however, was soon deemed unlivable by a worker that was providing Lacy and her family housing assistance and the Jacksons ended up living their rent free for 8 months. In 2011, Lacy and her family moved back to her home neighborhood of Algiers, in Orleans Parish, staying there for two years. However, stability was still out of Lacy's grips, as her and her family ended up moving locally to three more apartments before finally settling down.

In 2011, Lacy's father passed away from a heart attack, and, a year later Hurricane Isaac struck. When Hurricane Isaac threatened the Gulf Coast, the Jackson family went to Lacy's mother's house in Harvey, Jefferson Parish. Jason, now 9 years-old, recalled this hurricane much more vividly than the previous ones, and described how he packed up and went to his grandmother's house during the storm. Although Jason said the experience was "not that difficult," he did not remember many details of the actual experience. The storm created minor damage to the Jackson family's home, caused electricity outages, and left Lacy's neighborhood without trash pickup for days, leading her to call the news to try to get action. While Hurricane Isaac's impacts were relatively small, already financially struggling, the disaster added to and amplified Lacy's financial burdens.

Soon after Hurricane Isaac struck, Lacy and her husband split up, placing full parenting responsibilities on her. This separation was especially hard for Veronica, as she was very close to

her father and rarely saw him afterwards. Adding to this difficulty, Veronica was also being bullied by a teacher. Aside from the increased parental burdens these events placed on her, Lacy had left her job at this time, because of late payments, adding to her financial strains. In addition, Lacy's niece died of Sudden Infant Death Syndrome (SIDS) in 2014, which she emphasized had a huge impact on her, leaving her deeply emotionally distraught. As she told us the story during the interview, she pulled out her cell phone and showed us a picture of the beautiful child, dressed in her white christening gown. She cried as she told us again and again what a special child she was.

During our interview, Lacy was living in her own apartment in Algiers, Orleans Parish, demonstrating some stability, but she also explained that she still is financially burdened, lacking both transportation and employment. While sharing her story, she explained how the combination of disasters, deaths, secondary stressors, unstable displacements, and financial burdens put her into a depression and triggered her anger problems. Adding to this, she exclaimed that the government's failures, particularly regarding the lack of compensation for her home damages caused by Hurricane Katrina and her family's stay in the contaminated FEMA trailers, added to her and her family's psychological distress. Regarding the overall losses generated by the disasters, Lacy said, "So it's a lot of rebuilding and it's not just rebuilding things that you lost. It's rebuilding your mindset. It's rebuilding a whole lot. And it took a lot for me because I was younger."

Lacy articulated that she "no longer feels safe" in her city because of local violence and shootings, also noting high fears of violence and crime in her neighborhood on the most recent WaTCH survey. In fact, during the interview, she emphasized several times that she does not like to leave the house, even during daylight. The violence and rising rent prices in New Orleans led

Lacy to consider moving to the outskirts of Houston, Texas, where she had loved ones and hoped for better financial prospects. Lacy compared Louisiana to Texas, emphasizing that people have more opportunities in Texas. She also voiced her frustration over the government's inaction in the post-Katrina recovery and the current state of New Orleans, arguing that New Orleans has changed for the worst, explaining, "They [the government] don't do anything here, nothing. It's like, once Katrina came, that was a purge and they purged out all the clean souls. 'Cause I don't know, it's just different; New Orleans is different."

Despite all the suffering, instability, and displacements, Lacy believed that the disaster experiences "helped" her son Jason "appreciate things." She observed that he has become tired of the storms and is more protective over her because of them. Additionally, Lacy stated that these experiences taught her how to save money. Finally, she spoke at length about the fact that, while the disasters may partly have made her stronger, they, along with the deaths of her niece and father, led her into depression and anger problems. When asked how Lacy came out of and recovered from all these experiences she explained,

You don't. Because I really think now, before Katrina, I was better off. I had a job, I was working 6-7 days a week. You know, it was a lot of things that I had and that I could do. And since Katrina, and then it started with Katrina (thud), it was like a timeline, like one thing after another. So, I feel that's why I'm in the situation I am in today. Because there's so many incidences, then on top of that, like lately, I've been having so many deaths in my family.

Jason on the other hand felt the disasters made him and the city stronger and discussed his ease in adjusting to schools and making friends while displaced.

Of all the participants, Lacy faced the most adversities in the 11 years since Hurricane Katrina. Her already low-income status and lack of employment in 2005 was worsened with each disaster that struck. Further, while Lacy attempted to recover from each disaster, every time her life started to stabilize, some form of adversity would occur, placing her in continuously worse

conditions and creating a situation where she is still, in 2016, trying to get back on her feet. In addition, Lacy discussed lacking social support, explaining that she has no one to turn to for comfort or assistance, as her loved ones have problems of their own to deal with. While she did describe receiving some assistance from doctors and family members during her displacements and evacuations, none of this aid was enough to help her overcome the difficulties she was facing. Lacy's story demonstrates how difficult recovery from multiple disasters can be, particularly for single, low income, African American Mothers.

Lacy's story also provides an example of how government assistance programs can either work to help or can deter a person from achieving full disaster recovery. In Lacy's case, the Fannie Mae program was the only form of assistance that provided her any stability, although other issues, including her back injury and job loss, stopped this program from helping her to achieve full recovery. However, most of the other forms of government assistance Lacy sought out did more harm than good, leaving her with more housing, health, job, and financial problems than she had begun with. All of the adversities Lacy had endured had caused her to have a lower financial status, no transportation, and mental and physical health issues. This, along with her status as a single, African American mother, made it even more difficult for her to find and maintain a job, further exacerbating her problems; without some form of help or support, Lacy may not be able to ever fully recover from her disaster experiences.

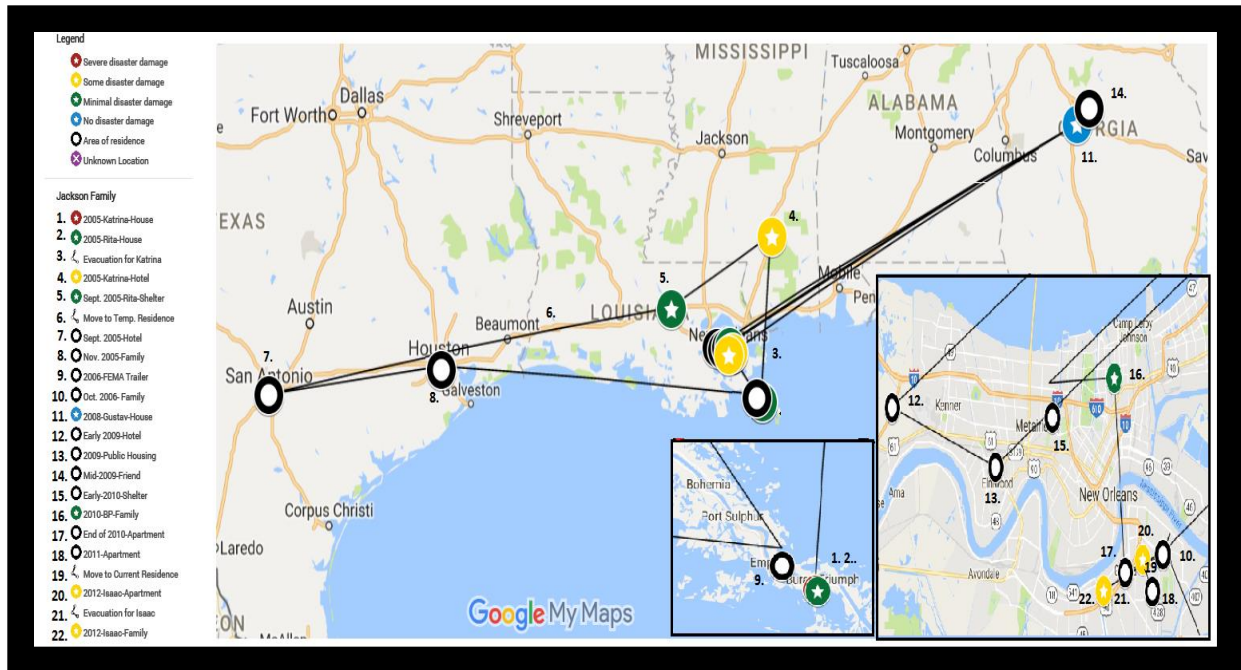


Figure 13: Residence and Evacuation Locations of the Jackson Family 2005-2016

The Allen Family

Susan Allen is the mother of Lacy Jackson (Susan, and her adult daughter, Lacy, were both recruited into the WaTCH study). While Susan and Lacy have dealt with some similar problems and both faced multiple deaths in their family, their disaster experiences varied as they were apart for most of the events.

A few months prior to Hurricane Katrina, Susan endured a complicated labor, which required surgery, while giving birth to her youngest son, Tyler. With the hurricane impending, Susan’s mother-in-law rushed her to evacuate, but her husband did not want to go. He was, however, convinced by his wife at the last minute to leave. The Allen family evacuated from Port Charles, Plaquemines Parish on the focal child, Oliver’s, sixth birthday. Not expecting to leave for long, the family did not pack much. On their way out of the city, the Allen’s tried to persuade their neighbor to leave with them, but she refused.

With no idea where to go, the family headed to Susan's aunt's house in Terrebonne Parish, but were asked to leave shortly after because of overcrowding and family tensions. They headed through heavy evacuation traffic and ended up at a school shelter in Marksville, Louisiana, where they had trouble accessing a TV to see what had happened to their city. Soon after, the Allen family went to shelter at a casino in the same area, where they learned about the storm's devastation and first heard the term "refugee" being used to describe the people of New Orleans. This label made the family feel stigmatized and left Oliver, the focal child, saddened as a consequence of the perceived mistreatment of his family.

The conditions at the casino shelter were uncomfortable, with hard cots to sleep on, little variety in food to eat, curfews, and filthy showers. Susan and her husband were stressed out over uncertainty about what they would do next and Susan tried to cheer her husband up, stating that they were still young and could rebuild. During this time, Susan and her husband sought help from FEMA, waiting in lines for hours to get on the phone and apply for aid. Fortunately, the family received some help from generous strangers, receiving a gas card, other material aid, and eventually, a place to stay in Marksville for a few days from what Susan termed as "adopted families."

When Hurricane Rita made landfall, the Allen family left Marksville and evacuated to Alexandria, Rapides Parish, to be close to Susan's sister. The Allen family stayed in a hotel in Alexandria while waiting out the storm. Financially struggling, the family relied on aid, in the form of meals, from the Red Cross. After Hurricane Rita had passed, they went to stay with Susan's uncle in law in Belle Chase, Plaquemines Parish, to be closer to home. Susan and her husband both started working in Plaquemines Parish and they were able to finally go and assess the damage to their home. Susan was heartbroken to find that her entire block, including her

home, had been completely devastated. She recollected, “It was nothing, nothing left down there. Everything was gone. Everything. Nothing to go back to but ground.” Her husband, who had inherited the house from his parents and rebuilt it, broke out in tears. Oliver vividly recalled this experience,

I remember coming back twice, having to try to come back twice. First time we weren't able to go to Port Sulphur, because they had a road block, it was like “you can't go down there.” And we kept asking “why, why, why?” and he [Oliver's father] just turns back around. So, when was able to, I witnessed my father cry for the first time, like I witnessed him cry for the first time. I'm like, I've had so many memories down here and now my cats missing, my bikes gone, my house is on the ground, and I'm like “what are we going to do now, where do we go from here?” And still, where we're still being called refugees, we're still being mistreated, we're still being put in a position where they just think we're very defenseless. That's why I believe that, as a family and as a whole, Louisiana has been stronger. Yeah, we have our ups and downs, but we're still strong together.

After a few days of staying at the uncle in law's house, Susan began to feel that their welcome was worn out. Oliver reminisced about this experience, discussing his frustration over hearing the adults arguing and stating,

I heard many times arguing about when we were going to leave, when are you going to find a place, or who's going to do this, who's going to do that, who's going to wash these clothes... I haven't slept, and I try not to remember it and I try to move on forward, but there are some things you can't come back from.

Susan then began looking for places to stay, and at the end of 2005, the Allen family moved to a house in Algiers, Orleans Parish. Over the course of the displacement, Oliver missed 3-4 months of school and struggled with the separation from his extended family, with whom he was very close. Furthermore, the Allen family never moved back home to Plaquemines Parish, largely because this Parish and their home were completely devastated after Hurricane Katrina. Oliver indicated his longing to go back to his home parish,

It was like every day I could remember, everything was, it was fun. I actually, I smiled every single day, I was so happy when I was down there [Plaquemines Parish]. And now it's like I'm up here [Jefferson Parish], I could still have the same smile on my face, but now I have more challenges because, you know, I didn't have to worry about stepping

out on my porch and somebody tried to rob me or walking to school and somebody trying to like, “hey you need to lift?” No I didn’t have to worry about that, because everybody down there, we all knew each other, we all, like if I did something wrong, I know my parents knew. It’s better, that’s my home. And I still, to this day, say that Plaquemines in my home, I don’t say, oh Harvey is my home or anywhere else is my home, no Plaquemines is my home, that’s where I feel the most comfortable... I know when I’m down there I’m safe, I’m at home, I’m respected.

The family stayed in the house in Orleans Parish until mid-2006, when it was sold, forcing them to leave. Susan, with nowhere to go again, felt like they had reverted back to “square one.” The Allen’s requested a large FEMA trailer, but received two smaller ones, which split the family up. Further, the trailer Susan and her daughter were in had formaldehyde in the walls, which made them sick. With help from her aunt, Susan found a place in Gretna, Jefferson Parish, at the end of 2006, where she and her family stayed for years. In 2008, finally settled down again, Hurricane Gustav came and forced the Allen family to evacuate; this time to Georgia. In Georgia, the family stayed with Susan’s daughter Lacy for a few days, then, because of overcrowding, headed to a hotel. Once the storm had passed, the family headed back home. Their home had little damage, but no electricity. Their neighbors, fortunately, helped them get the power to their home back on.

In 2010, the Allen family moved within Jefferson Parish, from Gretna to Harvey, where they got a house and are currently paying off the mortgage. This same year, the BP Oil Spill occurred. Susan’s husband and his family struggled during the oil spill, as they all worked in the fishing industry, and her daughter Lacy became sick working on this spill’s clean up as described in the prior section. The oil spill also negatively impacted Oliver, making him cautious about his diet, causing a horrible smell that made him emotional, and ruining his hobby of fishing for three years. This left him feeling detached from his roots, as he loved being on the water. However, Oliver was also proud of his family’s ability to respond to the disaster, describing how both after

the oil spill and Hurricane Katrina, they did not give up and worked on cleaning up the disaster damages.

On Christmas morning 2011, less than a year before Hurricane Isaac took place, Susan's husband had a heart attack and died in front of her in their living room as she tried to give him CPR. This was not only heartbreaking to lose the love of her life, she was also left as the sole guardian of her children and the only source of income for the household, placing the Allen family in both emotional and financial turmoil.

Less than a year after this terrible loss, Hurricane Isaac ensued; the Allen family did not evacuate for the hurricane, riding it out in their home with some of their extended family members joining them. They utilized a small generator during the storm, but still dealt with power outages, excess heat, and food shortages for about two weeks. While Susan recounted this experience as "horrible," Oliver thought that it was a fun, worry free experience with his family. Regarding the experience, he proclaimed,

And while everything bad is happening outside, we were inside having a very good time, not worrying about that. My mother's, my mother's sister, her son, my cousin, my cousin's girlfriend; my mother's sister's daughters were there too. And we were just all sitting, talking, and just having fun. And when it would stop, we went outside, started cleaning up. It wasn't nothing big for us, we like, we done did this before, no reason to over exaggerate.

Despite the upheaval, Oliver said he is "doing well," participating in the Young Marine's program, with high hopes for his future. He believed that the disaster experiences, specifically Hurricane Katrina, brought his family closer together and made him, his family, and his city stronger. In addition, he said that these experiences provided him some structure that will prepare him for the Marines, which he plans to join in the future. At the same time, Oliver also recognized how the disasters had negative long-term impacts on him, indicating that these experiences caused both him and others to "lose their smiles" and worry a lot. Describing the

difficulty of cumulative disaster and adversity exposures, he explained, “I could say that my childhood had not been a child, what I thought was a childhood was just, just me really preparing myself for the next natural disaster to come.” Further, he professed,

And it’s just the tears, it’s just the tears. So I had to develop a sense of strength at a young age, like everything that you see now had to happen at a young age. The man I am today probably wouldn’t be the man I was back then if Hurricane Katrina did not happen; umm, because now I’ve, I found a job, I’m able to work, make my own money. It’s [that]going through this has built many barriers, and with each barrier that I overcome, it’s like, you just, you’re going through the ranks with no problem; and that’s how I see it.

Oliver advised that when facing a disaster, it is important to know what is going on, be cautious, and mentally prepare yourself for what is about to come.

Since 2013, Susan has also had to endure the loss of her granddaughter because of SIDS and her youngest daughter, Heaven’s, problems with a teacher who was bullying her at school. In her interview, Susan explained that all the adversities she has faced since 2005 have left her feeling overwhelmed and her disaster experiences continue to haunt her. Regarding the accumulation of problems, she stated, “So, I mean, all of these storms and you know, now after all of this, then my husband leaves, then the grandbaby leaves and it’s just been one thing after another, after another, and it just hasn’t stopped.” Finally, Susan noted that communication and sticking together, particularly within a family, is key for dealing with disasters.

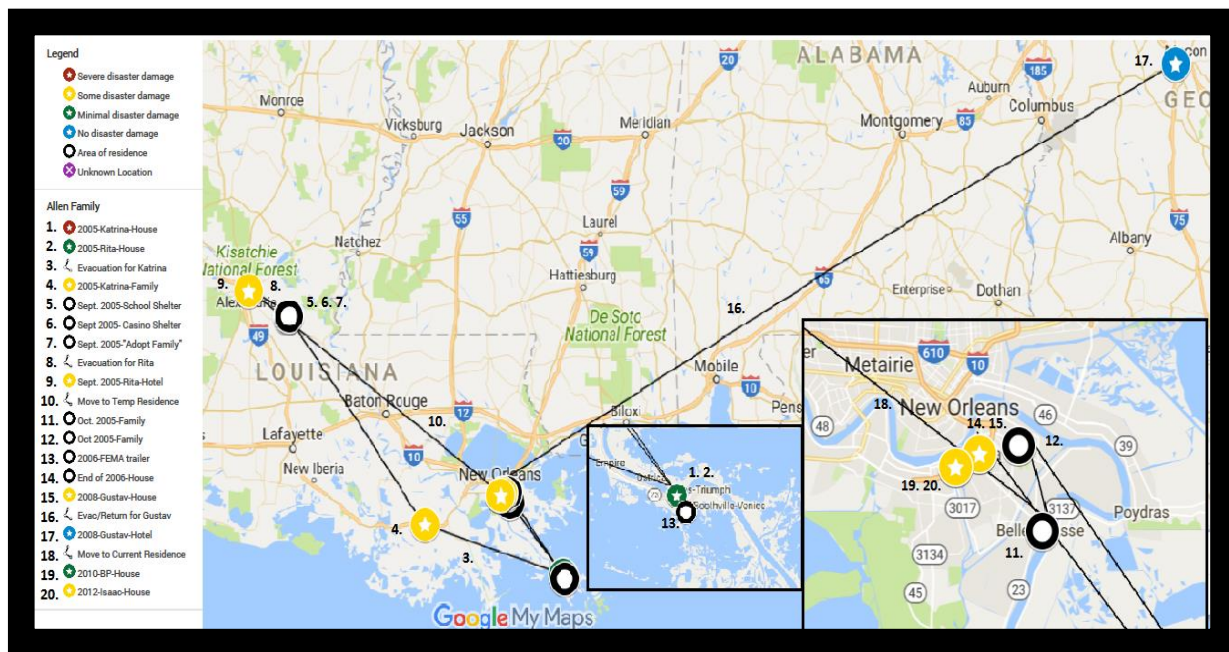


Figure 14: Residence and Evacuation Locations of the Allen Family 2005-2016

The Smith, Michaels, Jackson, and Allen families demonstrate the different ways that multiple problems can add together to make disaster coping and recovery extremely difficult. In some of these cases, the adversities enhanced one another in a vicious cycle of problems. In other cases, the sheer volume and magnitude of problems experienced became too much for a single person or family to handle on their own. However, in all these cases, the problems were too much, too extreme, and occurred too often. The following two families also faced problem pile ups, however their experiences were less detrimental to their ability to cope and recover from the disaster exposures.

The Johnson Family

When Hurricane Katrina struck the Gulf Coast in August 2005, the Johnson family and Christina’s sister evacuated from Montegut, in Terrebonne Parish, to Marietta, Georgia. With the help of Christina’s friend, the family stayed at a hotel for free for four days until the family headed back home for work. While Hurricane Katrina did not directly impact Christina’s house

or the rest of the Johnson household, her sister's house was severely damaged and all of New Orleans was disrupted.

Soon after Hurricane Katrina, Hurricane Rita made landfall to the west of New Orleans, forcing the Johnson family to evacuate again, this time for 2-3 months, returning to their home in Montegut at the end of 2005. During their displacement, the Johnson family spent a few weeks at a friend's house and the rest of that time in a hotel in Louisiana. This time, the house and most of the things inside of it were damaged and Christina recalled it as the worst disaster she had ever experienced. However, Jessica, the focal child, who was only three at the time of these hurricanes, did not recall any of the experiences.

During the long recovery from Hurricane Rita, Christina began having relationship problems with the father of her children, largely because of his drug use (she attributed it to the stress of the hurricanes and to financial struggles). Then, in 2008, Hurricane Gustav made landfall and again caused destruction in Montegut where Christina and her children still lived. That disaster, along with the drug issues and the father's lack of help in its aftermath, led to a permanent separation between him and Christina. Christina observed that this separation negatively influenced Jessica. Overall, Hurricane Gustav created some major damage to the Johnson's home and a couple weeks of displacement to Christina's sisters house in Hammond, Tangipahoa Parish.

In 2010, Christina was working three jobs, one of which was crabbing with her brother in-law, when the BP Oil Spill took place. Christina was no longer able to work this job because of the contamination and the shutdown of the Gulf waters. In addition, she had an allergic reaction to shrimp sprayed with dispersant after the oil spill, leaving her hands swollen and bloody, and creating a situation where she missed a family wedding and some days of work.

Christina, now a single mother of three children, having had her youngest daughter Mariah that same year, discussed how all of this placed her in the worst financial situation she had ever experienced. She was further stressed due to increased theft in the area and the fact that her father had lost his job capturing minnows for fishermen. Furthermore, the pollution from the oil spill prevented Christina from fishing as a hobby and, as Jessica recounts, generated a strong smell of the oil and a permanent change in the local seafood's taste.

In 2012, during Hurricane Isaac, the Johnson family evacuated to Christina's sister house again, where Christina watched worriedly as the water rose, hoping it would not reach the electricity box. Returning after Isaac, Christina observed oil pooled on top of the flooded water on the streets, which indicated to her that the oil spill was still causing ongoing environmental issues. The hurricane produced some minor flooding in the Johnson's home and, soon after the storm, they began repairing the damages caused over the years by the disasters experienced. During our interview, Christina pointed out the water line inside the wall in the small house that she and her family occupied along the bayou and theorized that mold was likely in the house given the repetitive flooding.

Growing up in the area, Christina noted the changes in weather and the environment. She emphasized the increase in disasters, recalling that as a child she had only went through one major disaster, Hurricane Juan. Examining all her disaster experiences, Christina said that hurricanes are easier to deal with because she "knows what to expect" from them. She also explained that helping others and being materially prepared is key for dealing with disasters, as is having close loved ones and family. Christina proclaimed, "Family first, I have good friends, that's, I mean, despite the bad down here, I mean, we kind of all pull together whenever something like this happened, so family or not, I mean, we're all going through it."

Alternatively, her daughter Jessica concluded that being informed about what is going on in the weather and “mentally preparing yourself for a disaster,” with the thought that “better things will come” and you can “learn from the experience,” is the key to surviving a disaster. She also demonstrated some adaptive capacity, asserting,

It’s kind of just part of life for us down here, like if it’s gonna happened then like we like we need to prepare for this, we need to watch the news, see if the like categories go up for it and stuff like that. So, it’s just like we are kind of use to it.

Moreover, looking back Jessica believed that the experience of multiple disasters brought her family closer together.

Despite the problems they faced, compared to other families that had problem pile ups, the Johnsons family coped relatively well. What differentiates this family from the four discussed previously, is not only their positive takeaways from their experiences, but also the fact that they had a stable place to evacuate to, only evacuated for short periods of time, had social support in the form of family and friends, never permanently lost their home, did not lose any full-time jobs, did not miss more than a few days of school, had no deaths in their families since 2005, and were never permanently displaced from their home in Terrebonne Parish.

Overall, the adversities that the family endured since 2005 created some emotional strain on their family, but the largest impact was financial.

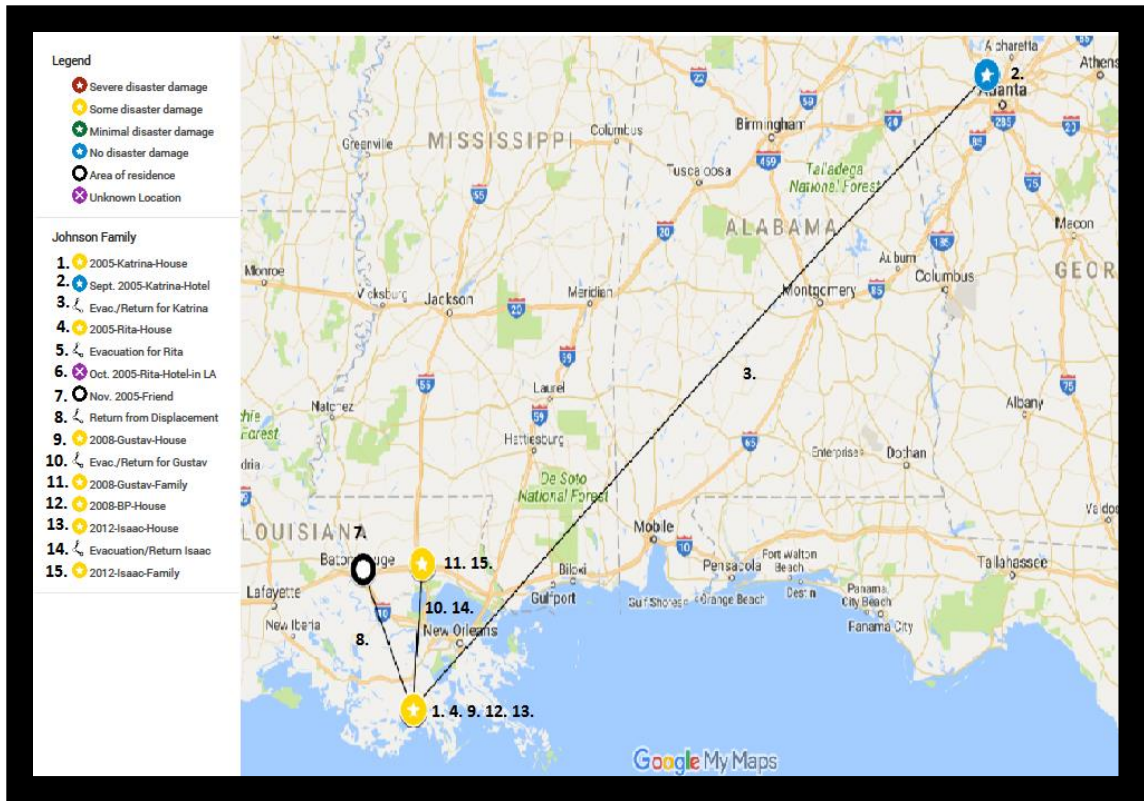


Figure 15: Residence and Evacuation Locations of the Johnson Family 2005-2016

The Jones Family

Sophia Jones had not experienced a disaster since Hurricane Betsy in 1965, so when Hurricane Katrina threatened the Gulf Coast, she did not fully realize the danger it posed. At the time of Hurricane Katrina, Sophia was scheduled for surgery and did not want to evacuate from her home in the Lower Ninth Ward of New Orleans, Orleans Parish. However, her husband convinced her otherwise and they headed to her brother's house in Baker, East Baton Rouge Parish. Downplaying the potential danger, the hurricane posed, the family packed very few possessions, losing the rest to the storm, with the exception of a cat, a fish, and a baton.

When Hurricane Rita struck, the family wanted to evacuate from Sophia's brother's house, but, with nowhere to go, they remained in the area, facing four days of limited water, food, and power. Despite these problems, Sophia felt better dealing with a hurricane in this area,

as opposed to New Orleans, because it had a country, “open” feel to it. Further, looking back, she believed that staying at her brother’s house strained his marriage and contributed to his divorce. After Hurricane Rita passed, the Jones family split up, with Sophia’s oldest daughter, Felicity, heading to Texas with her in laws, her son Sam staying in the area with other family members, and her son Martin heading back to Orleans Parish early for school. While the separation was difficult, Sophia believes that the experience drew her sons closer to each other and their friends. However, she also suspected that they had some issues adjusting in Baton Rouge, because of a lack of diversity in their new schools. Furthermore, the hurricanes led to some marital turmoil for Sophia, as her husband wanted her to “sit and wait” and she “couldn’t do that.”

Sophia, her husband Kyle, and Samantha stayed in the Sumter area of East Baton Rouge Parish after leaving Sophia’s brother’s house, first residing at a cousin’s house for a few weeks, then moving to an apartment in Baker; during this time, Sophia found a job as a teacher. Samantha recalled her experience staying with her family while displaced as being uncomfortable and overcrowded. Overall, the family stayed in East Baton Rouge Parish for about half a year, because of the severe home damage the hurricanes had caused. While in this area, they confronted food shortages at the grocery stores and stigma because they were from the Lower Ninth Ward.

Samantha, who was six at the time of Hurricane Katrina, ended up missing 3-4 weeks of school, moved to 4-6 different schools, and had issues adjusting to the different schools and making friends. Samantha attributed her school adjustment issues to being treated differently than other students and being labeled as a “victim” by both teachers and peers; this left her feeling isolated and upset. She recounted,

Yeah, because I felt like I was treated somewhat like, I was handicapped. I think it was, that’s what I’m going to say, because ... it was like I was victimized because I was from

a place that had been flooded and stuff. But I don't think I should have been treated differently, I mean maybe some people might need, you know, assistance or something, but if I don't need the assistance or I, like I just want to fit in and feel comfortable. I think that should, like I should have the opportunity to do that... The thing that made it hard were the people's attitudes and behaviors toward me so, I don't think any aid could have really helped me, because they provided that, if like you needed anything they were able to get that to you. The only thing that really impacted me was the attitudes and behaviors of people toward me.

In early 2006, Sophia and her family moved to her mother-in-law's house in Hollygrove, Orleans Parish, where they stayed until they rented an apartment in 2012. Sophia did not enjoy living in Hollygrove, as she thought there was too much violence and crime in the area. After moving, her husband, Kyle, went back to work, Sophia got a new job at Lowe's, and the Jones family began to work on repairs to their home. Restarting work, Kyle was troubled by his experiences seeing dead bodies and Sophia, attempting to aid her husband, provided a listening ear. In 2008, right after Sophia had her delayed brain surgery, Hurricane Gustav struck. The Jones family feared the storm would displace them again, creating more school instability for Samantha. Luckily, they were not displaced, the home they were residing in was not damaged, and Sophia's brain surgery helped "numb [her] emotions," which she believed ultimately helped her get through the difficulties created by the disasters. However, despite the minimal damage and the mitigating impacts of the surgery, Sophia still had some discontent,

All her [the mother in law's] things were in place, nothing happened up there. It was crazy. It was like, we left from a war zone and you go up there and we was still in a war zone but no water hit. You understand what I'm saying? We was like a fish out of water. We was surviving. But the environment was horrible. So bad.

In 2010, after recovering from the surgery and going back to work, the BP Oil Spill happened, causing Sophia to go through respiratory testing at work and to stop eating seafood. The disaster also generated financial cutbacks in the city which, Sophia argued, caused a ripple effect that led to her work hours being cut. This not only placed a financial strain on Sophia and

her family but left her emotionally distraught. Samantha and Sophia both linked the BP Oil Spill and the air quality after Katrina to their respiratory problems, allergies, and asthma.

In 2012, after moving to an apartment in Fillmore, Bossier Parish, and still fixing up their home; the Jones family evacuated for a few days for Hurricane Isaac to another brother's house in Baton Rouge, again dealing with electricity and food problems, but this time no apartment damage. Within a couple years after Hurricane Isaac, the Jones' family home in Orleans Parish was mostly rebuilt and Sophia, her husband Kyle, and her two youngest children, Samantha, Martin, returned. After moving back, Sophia noted that her neighborhood still felt like home and did not change after Katrina, except for the neighborhood becoming more diverse, which she liked. Alternatively, Samantha said that her neighborhood got much quieter and older in terms of the population.

In 2016, Sophia claimed that, while their living situation is now stable, she has had increased financial problems that have not been resolved since Hurricane Katrina. Further, while Sophia did discuss lacking social support, she did list "togetherness" as a way to mitigate against the stress of the adversities and disasters, stating,

Mentally it was a strain on us, just not being together. It's a togetherness. You know? even though if you fight and you argue and stuff, you still know when you come home you're going to see your brother or your sister or your husband or whatever. And it kind of helps you with any problem.

During her interview, Samantha discussed how she still had a difficult time adjusting to school after moving back to New Orleans. However, she has been able to excel in school despite these difficulties, receiving a scholarship and becoming a two-time valedictorian. Overall, Samantha believed the disaster experiences taught her how to adapt and claimed that, in order to survive disasters, one must have a positive attitude and attempt to learn from the experiences.

Further, she attributes her academic success and ability to cope with the disasters to her family’s support, her parent’s protection, “shielding” her from the disaster exposures, and her parent’s coping capacity. She reflected on her experiences since 2005, claiming that the disasters helped make her a more helpful, selfless, and mature person. At the same time, she also recognized that there were undoubtedly things she lost as a consequence of the storm, and moments of her childhood that were stolen away. She elaborated,

Losing everything and having to start over again, and I mean, you know, we didn’t expect to be gone that long, so we didn’t pack that many clothes and things, like all of our stuff. I had just joined a dance school right before like, I was supposed to start I think that Monday but I never did, so I could’ve been a dancer or something, but that opportunity is gone.

Since 2005, the Jones family faced home damage, family turmoil and separation, medical problems, multiple moves, uncomfortable living situations, and job loss. What differentiates the Jones family from the most severe cases of problem pile up discussed above, was, in part, due to Sophia’s stable marriage, the fact they had fewer displacements over a shorter physical distance, and less severe job and home problems.

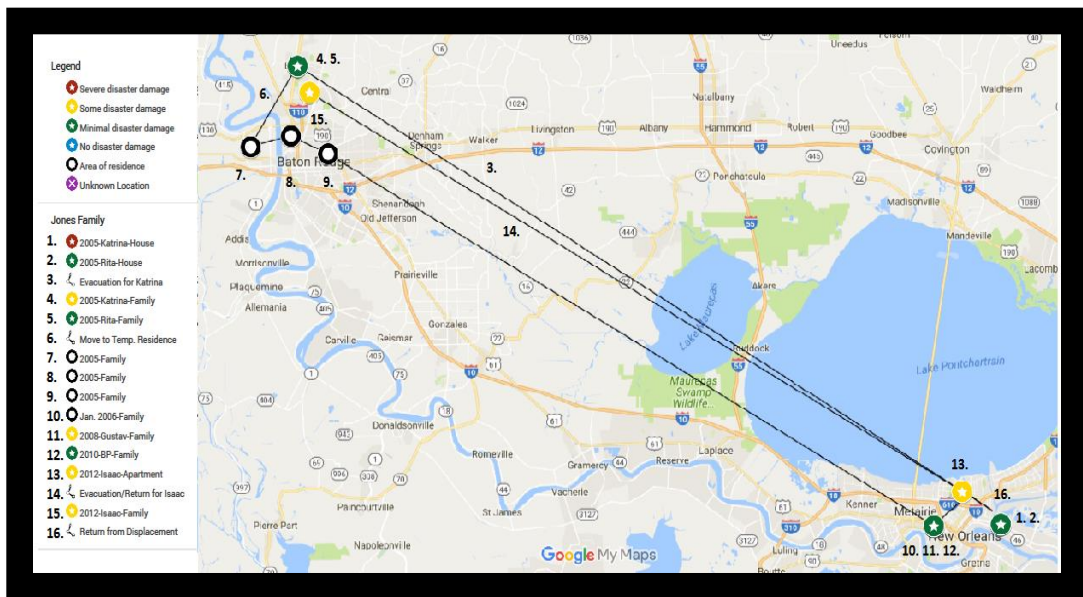


Figure 16: Residence and Evacuation Locations of the Jones Family 2005-2016

CHAPTER 5: ADAPTIVE CAPACITY

The stories described in the prior chapter illustrate the challenges that the combination of multiple disaster exposures and other adverse life events can have on coping and recovery. This chapter focuses on factors that may help mitigate the most severe effects of disaster, including social support and adaptive capacities. The first section of this chapter will discuss literature and patterns in the current study regarding social support. The next section will describe the experiences of the last three mother-child pairs and their families, illustrating how and why these families were able to adapt and recover, even in the face of multiple disaster exposures.

Social Support Networks

It is well established that having access to social support networks facilitates disaster coping and recovery; conversely, a lack thereof is linked to increases in disaster vulnerability (Bolin and Stanford 1991; Farber 2007; Goldmann and Galea 2014; Logue, Melick, and Hansen 1981; Norris and Kaniasty 1996; Ozbay et al. 2007; Yandong 2007). Research conducted on both received and perceived social support of adults and children alike indicate that social support can aid in coping and psychological well-being and functioning during and after disasters. As these types of support reduce the number of disaster related stressors and resource losses and mitigate against psychological distress and physical health problems for years after a disaster has occurred (Chan et al. 2015; Cheever and Hardin 1999; Felix and Afifi 2015; Felix et al. 2015; Harville et al. 2010; Lowe, Chan, and Rhodes 2010; Lu. 2011; Norris and Kaniasty 1996).

High levels of received social support can positively influence levels of perceived social support, which in turn can reduce distress (Bonanno et al. 2010; Kaniasty and Norris 1995; Norris and Kaniasty 1996). However, the mitigating effects of social support are not absolute, as

high amounts of adversities and disaster exposure can both lower levels of perceived social support and diminish the positive influence of received social support (Bonanno et al. 2010; Craig et al. 2017; Kaniasty and Norris 1995; Norris and Kaniasty 1996). Thus, while social support is helpful during times of adversity, its usefulness is also influenced by other variables.

When examining received familial support, research indicates that family relationships can help in disaster recovery and coping with stress, providing emotional, financial, and instrumental support (Marttila et al. 2013; Reid and Reczek 2011). Furthermore, families work as a response unit for disasters, influencing evacuation, disaster planning, exposure to disasters impacts, and disaster recovery (Masten and Obradovic 2008). However, family can also increase strain and worsen the impacts of a disaster. In addition, stressors can increase family turmoil and conflict, straining relationships, particularly those that already had problems prior to the stressor emerging (Reid and Reczek 2011).

Several studies have found parental attachment and high quality parent-child relationships to be vital for children's ability to cope with and recover from disasters. This is because children tend to look to parents or other caregivers, from which they formed attachment bonds, during stressful or dangerous events, including disasters, for a sense of security and comfort (Masten and Obradovic 2008). A research article by Garfin et al. (2014b) suggests that children's perception of their caregiver's availability for them after a disaster can help mitigate against the children's distress; in contrast, conflict with caregivers was linked to post traumatic stress symptoms. Further, parental warmth, including parental responsiveness, nurturing, and affective communication, has also been associated with children's resilience to adversity. In particular, parental warmth, when combined with teacher support, can aid children socially,

academically, and psychologically, making adversity seem less stressful, and thus reducing its negative impacts (Davidson and Adams 2013).

Likewise, the ways in which parents cope with disasters can impact the outcomes the disaster had for their children (Berre, Naser, and Overstreet 2010; Bonanno et al. 2010; Masten and Narayan 2012; Miller et al. 2012; Saylor 1993). Studies show that parents who had their children participate in preparedness activities had children who showed less fear and anxiety, more positive emotions, and psychological adaption to evacuations. Alternatively, when families evacuated quickly, without prior discussion or preparation, children were more likely to suffer from PTSD (Miller et al. 2012). Parents can further assist children in handling their emotions and learning positive coping strategies during disasters, along with providing them distractive activities, which help reduce disaster negative impacts (Miller et al. 2012; Saylor 1993). Children and parent mental health outcomes, including their psychological health, adjustment, and coping post disaster are also highly interlinked (Bonanno et al. 2010; Berre et al. 2010; Garfin et al. 2014a; Masten and Narayan 2012; Saylor 1993).

Extrafamilial social support can help mitigate against the effects of disasters. In one study, close neighbor relations provided frequent and reliable forms of aid and in cases where neighbor relations were previously not very close, severe disasters temporarily brought neighbors together (Cheshire 2015). Further, for children, extra-familial social support was connected to lower levels of PTSD, anxiety, and depression after disasters (Pina et al. 2008). Table 15 provides more information about the studies discussed above.

Table 15: Information on Social Support Studies

| Study | Location | Type of Trauma | Participants | Measures |
|------------------------|-----------------------------|--------------------------------|---------------------------------|--|
| Chan et al. 2015 | Louisiana, USA | Hurricane Katrina | 492 New Orleans Residents | PTSD, Psychological Distress & Social Support |
| Cheever & Hardin 1999 | United States | Any Traumatic Events | 1,427 Adolescents | Social Support, Self-Efficacy, & Self Health Assessment |
| Cheshire 2015 | Queensland, Australia | 2011 Queensland Floods | 27 Adult Participants | Neighboring Practices, Relationships & Support |
| Craig et al. 2017 | Florida | Adverse Childhood Experiences | 28,169 Juvenile Offenders | Social Bonds, Chronic Disease, Unemployment & Reoffending |
| Davidson & Adams 2013 | China | Cumulative Adversity | 1,659 Adolescents Age 13-16 | Parental Warmth, Teacher Support, & Internalizing Problems |
| Felix and Afifi 2015 | Puerto Rico | Hurricane George | 1,886 Parent-Child Dyads | Parent-Child Relationships & Physical Health |
| Felix et al. 2015 | California, USA | Wildfire | 50 Parent-Youth Dyads | Post Traumatic Growth, Fire Related & Life Stressors, Mental Health Inventory, & Protective Factors Survey |
| Garfin et al. 2014a | Bio Bio, Chile | Earthquake, Tsunami, & Looting | 1,000 Participants | PTSD, Global Distress & Functional Impairment |
| Harville et al. 2010 | Louisiana, USA | Hurricanes Katrina & Gustav | 102 Mothers | Social Support, PTSD, & Depression |
| Kaniasty & Norris 1995 | South & North Carolina | Hurricane Hugo | 1,000 Participants | Perceived & Received Social Support, & Social Embeddedness |
| Lowe et al. 2010 | Gulf Coast Region of USA | Hurricane Katrina | 117 Low Income Mothers | Post-Disaster Psychological Distress & PTSD |
| Lu 2011 | Louisiana, USA | Hurricanes Katrina & Rita | 303 FEMA Trailer Residence | Physical Health, Evacuation & Stress |
| Marttila et al. 2013 | Sweden | Cumulative Adversity | 13 Social Assistance Recipients | Resistance & Resilience Strategies, Social Belonging & Mental Health |
| Miller et al. 2012 | Tennessee & California, USA | Wildfire & Tornadoes | 56 Parents Disaster Evacuees | Parental Disaster Response & Child Coping |
| Norris & Kaniasty 1996 | United States | Hurricanes Hugo & Andrew | 902 Participants | Social Support & Psychological Distress |
| Pina et al. 2008 | Louisiana, USA | Hurricane Katrina | 46 Youth | Social Support, Discrimination, PTSD, Anxiety & Depression |
| Red & Reczek 2011 | Louisiana, USA | Hurricane Katrina | 71 Survivors | Stress & Familial Social Support |
| Yandong 2007 | China | Sichuan Earthquake | 558 Households | Social Capital & Disaster Recovery |

In the interviews, only three of the nine mothers reported having social support. Of these women, two were African American, one of these two women was married, and they both had household annual incomes of \$50,000 or more; the third woman who said she had social support was white, married, and had an annual household income of between \$20,000-50,000. None of these three women lived in Orleans Parish at the time of Katrina, and none had disaster-related loss of all sources of income, long, unstable displacements lasting more than six months, stigma during displacement, long recovery times lasting a year or more, or complete destruction of their homes. This group also included the only two women who had minor home damage throughout the disasters and most of those who noted, in their interviews, no pile up of problems and no deaths of loved ones since the first disaster exposure. Finally, all three of these women discussed how the social support from family, friends, and/or neighbors is important in times of disasters.

Unlike their mothers, all children in the current study said they had social support during their interviews. Several of the children discussed how the disasters brought their families closer together; this pattern held true even for the children that said, in their interviews, that they had disaster related family turmoil. The perception of familial social support by all of the children in this study may be why, despite the negative impacts of the disasters, none of the children reported in either their interviews or surveys having mental health or behavioral problems. In fact, the four children who indicated the most severe disaster impacts were also doing well in school.

Resilience, Adaptive Capacity, and the Exposure Outliers

The following section begins by reviewing literature to describe how disasters can enhance resilience and adaptive capacity. It uses the interview data to analyze how the three families who were able to cope best and recover most quickly from the disaster experiences were

able to do so. In addition, it provides some illustration of how adaptive capacity is formed. Again, after each family's story, there is a map illustrating their locations in relation to the disasters (shown as Figures 17-19) that I created using a severity score based on the maps shown in Figures 1-10. As these visualizations clearly show, these families had far fewer displacements than the families highlighted in the prior chapters.

While disasters have a multitude of negative impacts, some research has suggested that these experiences also have some positive impacts, describing how people can show resilience towards traumas and adversities, including increased strength, spirituality, and appreciation of life (Waters 2016). Studies on posttraumatic growth and resilience have linked them to high socioeconomic status, low levels of income loss and trauma exposure, few or no chronic health problems, few recent and past life stressors, high education, young age, male gender, disaster preparation, commitment to community, optimism, extraversion, hope, humor, low levels of depression and substance abuse, acceptance of the situation, high levels of social support, problem focus, and positive reinterpretation coping (Abramson et al. 2014; Bonanno et al. 2007; Bonanno et al. 2010; Broussard and Myers 2010; Cherry et al. 2016; Garrison and Sasser 2009; Joseph and Butler 2010).

Posttraumatic growth can help people find new opportunities, form deeper relationships, feel more prepared for future adversities, appreciate life more, reorder their priorities, and have a deeper spirituality. However, for posttraumatic growth to occur, families and communities must be flexible and stable, effectively organizing to respond to traumatic events and reallocating roles and resources to adapt to changes caused by these events. Further, they must be able to quickly restore order, stability, and safety. Achieving all this requires close connections, cohesion, communication, tolerance, and respect (Walsh 2007).

It is well established that previous traumatic or disaster experiences can help people better cope with future disasters, as the initial experiences can work as learning experiences, aiding the development of adaptive capacity. For example, some studies report that experiencing high levels of exposure to one disaster can lower the impacts of future, less severe disasters (Broussard and Myers 2010; Felix et al. 2015; Salloum et al. 2011; Weems and Graham 2014). One nationally representative study on lifetime adversity by Seery, Holman, and Silver (2010) found that those who had some adversity in their lives had better mental health, higher levels of well-being and life satisfaction, and were least impacted by recent adverse events, compared to those with either high levels of lifetime adversity or no adversity experiences. The authors of this study speculate that limited exposure to adversities can work as a “stress inoculation,” “toughening,” or “immunization,” allowing people to perceive future adversities as being more manageable and making people more emotionally stable and better able to cope with both future major and minor stressors. However, a lack of adversity provides no opportunity to become “tougher” or more prepared, while too many adversities can be too damaging to recover from (Seery et al. 2010). Several studies have also linked successfully overcoming adversity to more self-efficacy and self-worth (Masten and Obradovic 2008).

When examining children, research has indicated that many children recover from disaster related distress within the first year after the event. Similar to findings with adults, children may also learn and grow from the disaster experiences, particularly when they have high levels of perceived social support, community support and resilience, low levels of loss, and high socioeconomic statuses (Abramson et al. 2014; Bonanno et al. 2010). Children, just like adults, were able to show signs of adaptive capacity based on the factors discussed above, as well as functioning schools and child care facilities, self-efficacy, faith, self-regulation, and intelligence.

Further, children coped better when faced with moderate degrees of adversity, as opposed to a high degree or no adversity (Abramson et al. 2014; Masten and Narayan 2012).

Even though cumulative adversity is often associated with educational under performance and displacement related bullying of children, academic achievement can help increase children’s resilience, particularly when teachers and peers are supportive and encouraging (Gilligan 2007; Pfefferbaum et al. 2016). While relocated students are more likely suffer academically one-year post disaster, many students show academic improvements two years post disaster (Pfefferbaum et al. 2016). Table 16 provides more information about the studies discussed above.

Table 16: Information on Studies of Adaptive Capacity

| Study | Location | Type of Trauma | Participants | Measures |
|------------------------|----------------|-----------------------------|----------------------------------|---|
| Bonanno et al. 2007 | New York, USA | 9/11 Terrorist Attacks | 2,752 Participants | PTSD, Depression & Substance Abuse |
| Broussard & Myers 2010 | Louisiana, USA | Hurricane Katrina | 5 School Nurses | Social Support, Embeddedness, & Preparedness |
| Seery et al. 2010 | United States | Cumulative Adversity | 2,398 Participants | Mental Health, Wellbeing, & Adversity |
| Waters 2016 | Louisiana, USA | Hurricane Katrina | 1,019 Community College Students | Physical & Mental Health, & Econ. & Soc. Functioning, |
| Weems & Graham 2014 | Louisiana, USA | Hurricanes Katrina & Gustav | 141 4th to 8th Grade Children | PTSD & Disaster Coping Style |

Compared to the families discussed previously, the following three families experienced far fewer overall problems from 2004 to 2016 and had higher levels of social support factors. Further, while these three families showed the most resilience and adaptive and coping capacities, when comparing mothers to children, all the children in this study seemed to cope much better with the disaster experiences than their mothers. In fact, seven out of nine children discussed some positive impacts of the disaster experiences, and four of these noted in their interviews that they felt more prepared for future disasters. The stories of the final three families,

their disaster experiences, and the ways in which they achieved adaptive capacities are discussed in the following sections.

The Bryant Family

In 2004, Hurricane Ivan threatened the Gulf Coast and the Bryant family evacuated from their home in Terrytown, Jefferson Parish to a hotel in College Station, Texas for a few days. On the way to Texas, Miranda, the focal child, remembered the six-hour drive and the stress her mother was under; seeing this caused Miranda to begin maturing and prompted her to do all she could to aid her mother. The hurricane did not cause any major damage to the Bryant family's home, but created a power outage which meant the family was left in hot and humid conditions.

The following year was eventful for the family, as Natalie gave birth to her youngest child, Patrick, her mother passed away, and a few months later, Hurricanes Katrina and Rita made landfall. Miranda, who was four at the time, recalled how much stress this put her mother under, again pushing her, at a very young age, to become more mature and helpful. Reminiscing about all the 2005 adversities they faced, Natalie recounted

And then too, my backbone, my mother, she passed in 2005 and after that I was on my own with the hurricanes and so I learned a lot for my age, it was just a hard time. It's just something that you have to go through in life and build yourself up at your own pace, and that's what I did. Make myself stronger and I have to be there for the kids and stuff too.

Similarly, her daughter Miranda said

I lost my grandma. It's sad, like I try too hard to like remember stuff from her, and all I can remember is disaster because Katrina, like we did not even have enough time to grieve I feel, because then Katrina happened and it's just (thud) right after you lose a person, like you love, and that's always been there for you, it's just like, you had no time between that to take a breath and be like, "Okay I got this," and then something major happens.

The family evacuated to a relative's home in Houston, Texas for Hurricane Katrina, where they sat and watched the news reports, waiting anxiously for both hurricanes to pass. They

stayed in Houston for a couple months, going back and forth between Texas and their home in Jefferson Parish, which was damaged and had mold and mildew growing inside. It took the Bryant family about half a year to fully fix up their home, moving back in early 2006. During the time of displacement, Miranda recalled having issues adjusting to school, after being displaced and missing a few days of school during the evacuation. However, Miranda also discussed how her mother would patiently sit and help her with her school work, aiding her in her adjustment.

In 2008, a couple years after settling back in Jefferson Parish, Hurricane Gustav hit. The Bryant family did not evacuate this time, facing power outages and relying on food and supplies from the local Naval Base. Miranda, now seven, remembered having a positive experience visiting the Navy Base, but also remembered how there was some minor flooding in her home during the storm. During the hurricane, Natalie tried to stay calm for her children and Miranda recognized this, showing appreciation for her mother's selflessness and care for her and her siblings.

In 2010, the BP Oil Spill occurred, causing Natalie to become increasingly vigilant regarding the food and water her family consumed. Natalie made efforts to keep her children away from seafood and was careful with the water they drank, making sure to either boil water or purchase it. In addition, Natalie recalled smelling and seeing oil in the water in surrounding regions. Miranda followed her mom's guidance during this time, as she saw that others in the area were getting sick from the oil spill.

In May 2012, the Bryant family moved to a new residence in the West Bank of New Orleans, where they are currently living. The move was caused by the cheaper prices of housing in the West Bank and the accumulated mold in their Jefferson Parish home, which Natalie believed was created because of the previous hurricanes. Soon after moving, Hurricane Isaac

ensued; The Bryant family again did not evacuate for the storm, encountered minor home damage, received aid from the local Naval Base, and suffered a power outage, this time lasting for eight days.

At the time of our interview, Natalie did not voice any issues with housing, employment, or finances and Miranda discussed being placed in a gifted program at school. Miranda claimed that the close-knit structure of her family and her mother's ability to "stay strong" and not break down during the disaster was both comforting and helpful. Reflecting on her experiences, Miranda described how the disasters brought her family closer together and also proclaimed that the disasters made her family stronger. She voiced,

... it makes me realize how close of a family we were and we are, and how at any time of need, they'll always come to help us and to our rescue basically and always make sure we're okay no matter what. It builds a different admiration and love and stuff like that because you realize this person, these people are always gonna be here for you no matter what. In a time of need, they're always there.

Unlike the families discussed in the previous chapter, the Bryant family was able to fix their home in less than a year, were not forced into multiple, long, unstable displacements, and were not bombarded with multiple problems at a time, with some distance between most of the adversities they faced. This made it easier for them to bounce back after each adversity, with time to prepare materially and emotionally before the next negative event or disaster occurred. Further, even though their disaster experiences were largely negative, they taught the Bryant's how to deal with future disasters, perhaps because they had the time and space to learn these lessons as they were not always in crisis. Discussing the experiences, Natalie stated,

It just, you know, and by then I was just like, read the lists, what we shouldn't do or whatever. I was used to it after all the hurricanes and stuff I'd been through so I just made sure the do's and the dont's and you know, just fought it through with that too.

Miranda also acknowledged how the disasters have made her more mature, prepared, and independent; she contributed this growth to the support her mother and family had given her.

Miranda reflected on her journey,

It's made me more prepared, I think, because I know stuff like this happens. And anything can happen. Like our house can get destroyed. And I think going through this, it's gonna prepare and make me more strong-willed to fight through it. And so I feel like if we just, if I've never been through this, I'd be completely lost. But I've basically lived my life going through this stuff, and I kind of know and I have experience so, I'm gonna know what to do. I am not gonna be as lost and confused as I would have been if I hadn't gone through this.

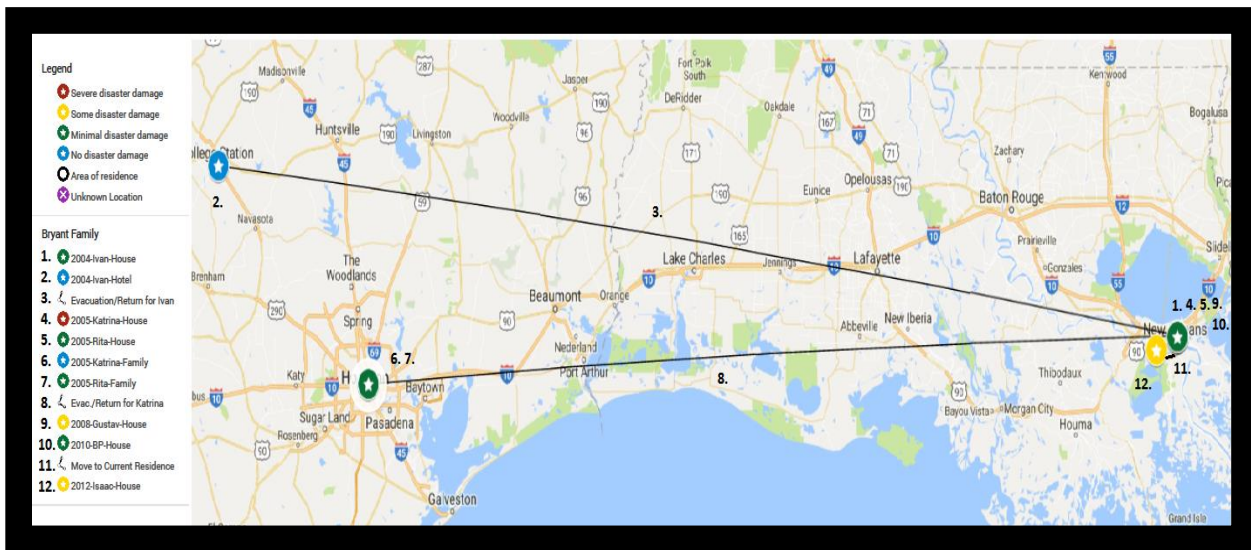


Figure 17: Residence and Evacuation Locations of the Bryant Family 2005-2016

The Green Family

Jackie Green was born and raised in New Orleans and, until Hurricane Katrina, she had never had to evacuate from her home. Prior to Hurricane Katrina's landfall, Jackie and her family evacuated from their house in Harahan, Jefferson Parish, to a hotel in Hot Springs, Arkansas. The morning after the storm, Jackie woke up, turned on the news, and found her entire city underwater. She was unaware of how bad the damage was to her home and did not know what to do next, as the Green family was short on money. While Jackie remembered worrying

about their home, Alex, who was the outlier child, recalled the beautiful hotel where they stayed, discussing how he spent his time playing pool during the evacuation.

When the Green family went home a few days later, their house was still standing with minor damage; however, they faced a week-long power outage. Jackie reminisced, “We were just out of place. At home, but out of place. I don’t know what else to say, it’s hard.” She also recalled feeling as though she was “camping in [her] own home.” Jackie’s children Matthew and Marsha were out of school for a few weeks. When the children did go back to school, there were different students and teachers because of the hurricane displacement. In addition, Hurricane Katrina added a financial burden to the Green family, with Jackie permanently out of job and her husband out of work several weeks.

When Hurricane Rita made landfall, the Green family evacuated locally to stay with Jackie’s sister for a few days. The storm caused issues with the family’s water supply, in which they had to boil water before using it or buy it. They also again experienced a multi-day power outage, and an extension of school closures, which is why the children took nearly a month to return to school. In her interview, Jackie stressed the financial burden these two disasters placed on her household, saying, “Our bills don’t stop. That’s another thing with Katrina and Rita. Your bills don’t stop coming in, but your paycheck stops because you’re not working. So that’s stress-level, big time right there.” While Jackie remembered these experiences quite vividly, Matthew, who was 7 years-old at the time, only recalled the financial strain and minor property damages from the storms.

By 2008, the Green family had moved within Jefferson Parish to Grand Isle to start a hotel business and spend more time together as a family. Soon after moving, Hurricane Gustav made landfall. Right before the storm occurred, Jackie and her children evacuated back to their

old home in Harahan, while her husband stayed in Grand Isle for work. Again, the hurricane left the Green children out of school and the family without electricity for a couple weeks. Jackie and her husband had sporadic contact during this time and were only able to get a hold of each other through text. A week after the hurricane, uncertain about how long the displacement would last, Jackie reenrolled her children into the local school in Harahan. Looking back, she regretted this decision, as the teachers were “mean” to her daughter Marsha. Matthew also remembered having trouble adjusting to the sudden change in school, as he described,

Well, down here we have a small school, like one classroom is filled with maybe 12 kids, and we only have like a little over 100 kids total, that’s from preschool to 12th grade. So when I had to go to that other school, Harahan elementary, it was big and I didn’t really know what to do there, cause it was a big change, so. I was trying, kinda struggling to focus, and cause down here it’s more personal with student-teacher relationships, cause there’s so little amount of kids, they can actually help you out, and then I had to re-adjust to a big school. So I just noticed a lot of things, how there’s a lot more troubled kids and nobody really knows each other unless they met outside of school. I noticed a lot more bullying too, in the bigger schools.

In 2010, when the oil spill devastated the Gulf Coast, it shut down the local beaches and permanently impacted the Green family hotel business. While initially cleanup work done by her husband and the cleanup workers who stayed at the hotel kept money coming into their business, the loss of regular costumers financially strained the family. Jackie called it a “false economy” in that it looked like recovery was happening, but after the workers went away, the tourists did not return, so the recovery was not permanent.

During the interview, Jackie’s husband chimed in and observed that the oil spill caused the local crabs to disappear and Matthew recalled the sight of dead fish and birds on their property. The family were unable to spend their time on the beach, were unable to fish, and dealt with the horrible and sporadic smell of the oil that created sinus problems for the family and

rashes for Marsha. Even though the family felt that the oil spill greatly impacted them, they were kicked out of a class action law suit against BP, because they were told it did not affect them.

In 2012, when Hurricane Isaac struck, Jackie and her children evacuated back to their old house in Harahan again, while her husband stayed in Grand Isle for work. The hurricane led to electricity, food, and water shortages, lasting for about two weeks in Harahan; however, Jackie and the children did not return to Grand Isle for several weeks, as the area was much slower to regain power than Harahan. Matthew, now 14 years-old, recalled the financial struggles this hurricane added to the family and how he kept track of his father via telephone, watching the news, texting his friends, and playing video games while waiting for the storm to pass.

In 2016, the Green family was still financially struggling because of the BP Oil Spill's permanent impact on their business. Besides this problem, the family was doing relatively well, with both children progressing in school, no familial turmoil, and housing stability. Further, even though the hurricanes caused school closures, Jackie and Matthew described how the local school system had a policy that adds on time to students' days, which helped the children make up the lost time and prevented any major negative impacts to their education. Matthew stated in his interview, though, that he does continue to worry about future hurricanes, articulating,

Yeah, usually when it comes to evacuation, I always worry about maybe the water coming over the levee and washing away a bunch of our stuff or damaging our house and... what would we do? We wouldn't be able to afford to fix it.

Regarding the overall experiences, Matthew explained that the previous disasters brought the community together, as everyone turned to help one another post disaster. Additionally, he discussed how these experiences have made him more mature and helpful. Matthew advised that staying close to family and friends and helping out are key for disaster coping; indicating that some children do place a heavy reliance on parents and family guidance during and after disasters (also see Fothergill and Peek 2015).

In her interview, Jackie claimed that her family received support from family, friends, and/or neighbors, describing the importance of this support and noting that during disasters “everybody just comes together.... You just work through it. You just turn to each other and hope for the best. That’s what we do.” Moreover, while extra-familial social support was seldom discussed in the current study, similar to studies on increases in post disaster community unity (Bonanno et al. 2010), Jackie described the community support her family received,

You get invited to stay in people’s houses that you are acquaintances with, you’re not really friends with them but your acquaintances. “Yeah, you come stay over here.” People, they come together. Any other day of the week, don’t like that person or whatever, but when a storm hits, “Yeah, y’all come eat, come stay over here.” It’s funny.

While the Green family faced problems caused by the disaster experiences, these challenges were less severe and enduring than most of the other families in this study. The Green parents were never both simultaneously unemployed, their home was never deemed unlivable, most of their disaster related problems, aside from the financial ones, were short lived, lasting less than a year, and the family had a second house to evacuate to for most of the disasters. Moreover, unlike the six families discussed in Chapter 4, the Green parents maintained their marriage throughout the disasters and were the only family that discussed having support from family, friends, and their neighbors alike.

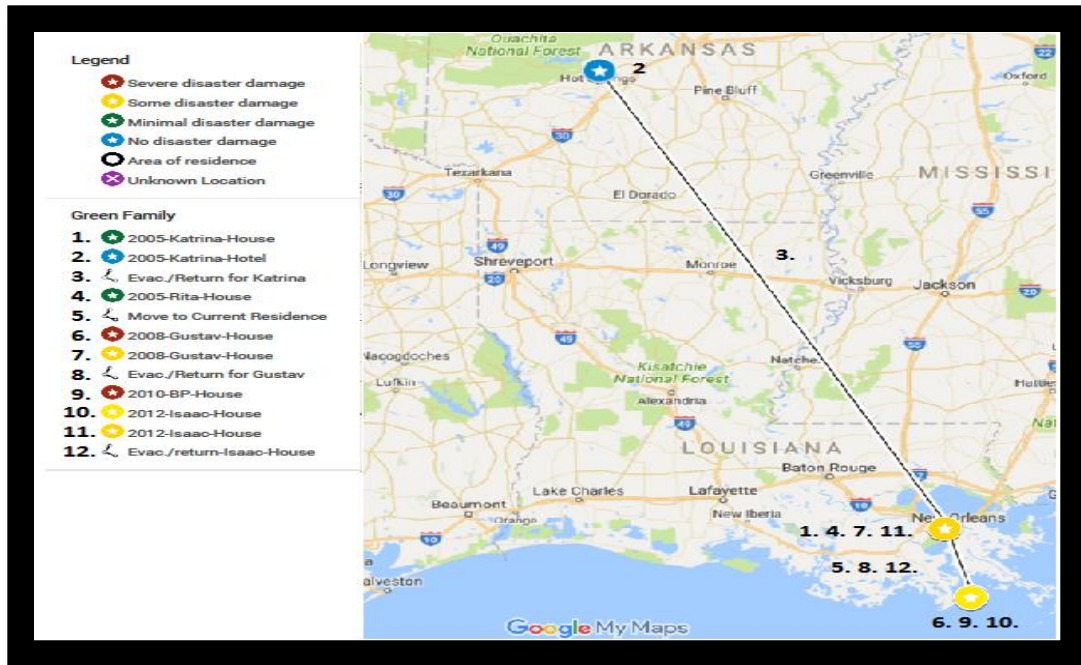


Figure 18: Residence and Evacuation Locations of the Green Family 2005-2016

The Williams Family

Daniela Williams had only experienced one disaster before 2005, Hurricane Betsy in 1965, which did not “have much of an impact” on her. In 2005, as Hurricane Katrina made way to Louisiana, Daniela, her son Charlie, her two youngest daughters, and her newborn grandchild evacuated to Atlanta, Georgia where her oldest daughter resided. The drive there took a very long time and they had to spend the night at a rest stop. Expecting to be gone for a few days, the Williams family did not pack much. This was unfortunate, as their displacement ended up lasting four months. During their displacement, Daniela’s husband stayed at their home in Westwego, Jefferson Parish, for work. Fortunately, the hurricane only caused minor damage to the Williams’ home. Daniela and her children stayed away from home, though, until her husband gave them the okay to return.

The stay in Georgia involved just one move for the family, as they relocated from the Hilton to the Best Western. They received some government aid during this time. Soon after

arriving in Georgia, Daniela enrolled her two youngest children into school and would take them to amusement parks and other activities to occupy them on weekends. While both Daniela and Charlie did not characterize their displacement as being “a bad one,” they did miss home and Charlie’s father, who tried to make this separation easier for his family by visiting them in Georgie whenever he could. Daniela described the experience as “a forced vacation,” and said, “It wasn’t that bad, but you just wanna be home. You’re not in Kansas no more, and there’s no place like home.” Still living in Georgia, Daniela and her children were not impacted by Hurricane Rita and considered it part of Hurricane Katrina, in that it just further delayed their return home.

At the end of 2005, the Williams family returned home to find that everything on their side of the river was basically undamaged, although some people in their neighborhood never returned. While Daniela stated that Hurricane Katrina was the worst disaster she has ever endured, she was able to acknowledge both positive and negative aspects of the experience,

The fact that you had to leave for so long and the unknown [was what made Hurricane Katrina the worst disaster experienced]. It was like, you relied heavily on your electronic gadgets, be it your phone or your computer, because a lot of it you didn’t know. But when I tried to talk to him [her husband], to see what was going on and things like that, a lot of people didn’t have that. I was fortunate he stayed. Other people didn’t have that. My house, I did have that relationship with my husband, he stayed here, I was gone. He told me when, where, it’s time to come back, “you need to stay up there”, “don’t come back here right now”, “it’s not what you think it is”, “it’s was just chaotic”. That was all he had to tell me and I’ll stay up there.

Looking back, she felt that the biggest transition after the storms was related to her father moving into the household for two years, as his house was destroyed in the hurricane.

When Hurricane Gustav made landfall in 2008, the family stayed in their home, waiting out the storm while they played board games. Aside from the uncomfortable heat, a broken trampoline, and Charlie losing his teacher because of displacement, the family did not face any

negative impacts of the storm. The 2010 BP Oil Spill also produced relatively minor problems for the Williams family, with the exception of exposure to the “horrible smell” of the oil and exclusion of seafood from their diets. In addition, the oil spill caused Daniela’s husband to work overtime, which gave the family more money, but as Charlie noted in his interview, kept him away from his family for long periods of time.

The family did not evacuate for Hurricane Isaac in 2012, entertaining themselves by watching movies and observing the wind, rain, and falling trees caused by the storm. For this hurricane, the family had no home damage, but faced a power outage, that was largely alleviated by their generator. In 2016, the Williams family was doing well financially and had maintained economic, housing, and employment stability since 2005. Regarding her disaster experiences since 2005 Daniela concluded,

I think if anything it [the cumulative disaster experiences] makes you stronger. Because you, you have to deal with it. You just don’t know when, where. But it’s something that mentally, you have to say, "Okay I have to prepare myself." Be it getting batteries for your lights, your flashlights... You got to mentally prepare for it. You just don’t know what the outcome is gonna be.

She also proclaimed that preparation and communication with one’s children is key for dealing with disasters. Regarding this, Daniela elaborated,

Yeah, I guess the relationships I have with me and my children, I have them aware of everything ... I just kinda talk to them. I make them aware of everything step by step by step. What we’re gonna do, how we’re gonna do it, this is the plan We’re all on the same page. Maybe a case where mentally they may say, "Sheesh, another frickin’ hurricane." But they never express it to me. I think we’re all kinda like, "Road trip." (laughter).

Charlie expressed similar sentiments, describing how the disaster experiences made him more prepared and advising that, in disaster situations, “It would seem hard in the beginning, like adjusting, but in the end, it’ll get better.”

The Williams family fared the best of all the families in the current study, showing no long lasting impacts for any of the disasters. While they did face displacement, separation, and missed school during Hurricane Katrina, these problems were all short lived and the family had no severe impacts to their house, employment, or financial status for any of the disasters. This may have been because Daniela's husband had a high paying job at in the oil industry and the family had a large home, which was in a much more spacious, less densely populated region than other study participants and was out of the way of most of the hurricane paths. The family had also made some preparations for these hurricanes, having extra food, water, and a generator available to help ease their discomforts while the storms passed through the region.

This family's experience shows one of the best case scenarios for creating adaptive capacity; where the impacts of the disasters are minimal, there are few new secondary stressors, the family had financial stability before and after the disaster experiences, there is both employment and housing stability, the parents do not face separation or divorce, and there are multiple forms of social support available for family members to utilize, including support from both family and strangers alike. The combinations of these factors greatly increased the Williams family ability to recover and learn from each disaster experience, making them emotionally and mentally more prepared with each disaster exposure..

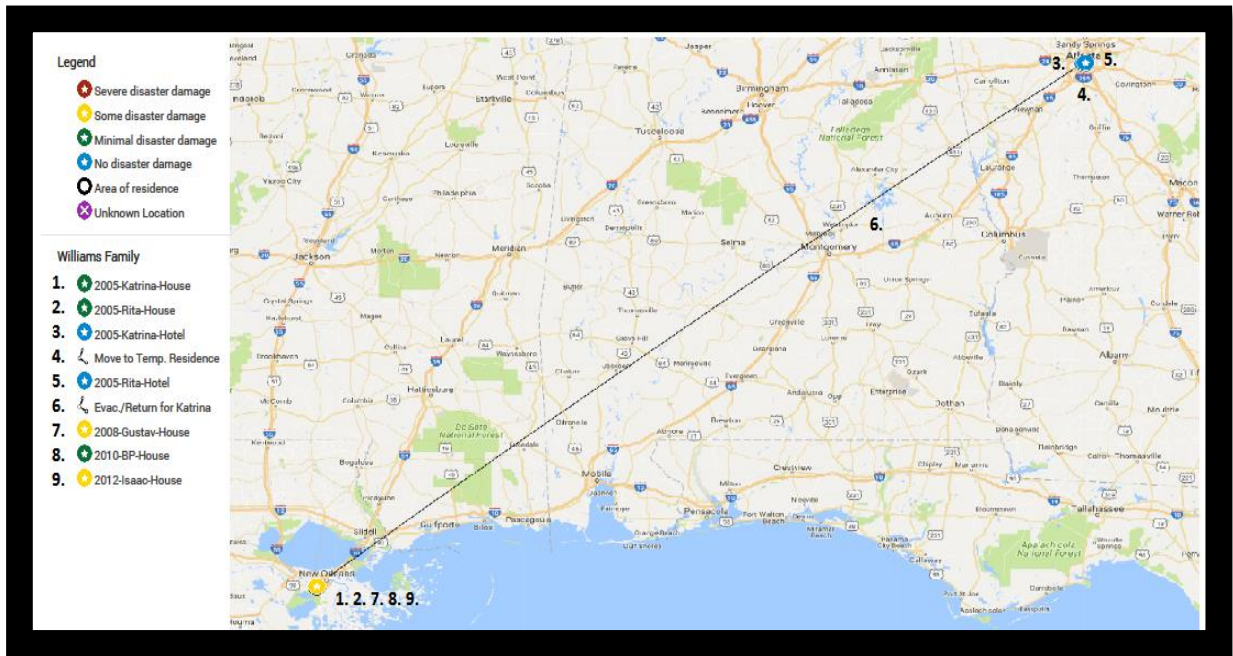


Figure 19: Residence and Evacuation Locations of the Williams Family 2005-2016

The three mother-child experiences discussed in this chapter demonstrate how the mitigating factors of social support and/or high income, can work together with low impact disasters, few secondary stressors, and housing and employment stability to create adaptive capacity for families, lessening the impacts of disasters and preparing them for future disasters.

CHAPTER 6: CONCLUSION

The current study sought to understand how cumulative disaster exposures impact mothers and their children and what strategies mothers and children use to cope with these exposures. When examining the former question, this study found that there was great variation between each person's experiences with multiple disaster exposures, both between and within families and between and among mothers and children. These variations were driven by a combination of factors including age, race, gender, marital status, income, types, disaster damages, degree and scope of losses, and amounts of assistance received. Secondary stressors were also important in determining outcomes and included factors such as displacement times and locations, and unemployment, divorce, and marital separation, death of a loved one, and various other changes in social support networks. Mothers and children used income, social support, and other forms of assistance to cope with the multiple exposures. The following section expands on these findings.

Results

First, and most important, although this was a thesis focused on cumulative disaster exposure, the study suggests that disasters alone are not the root of most of the negative health and economic outcomes families experienced post disaster. Rather, it was the combination of the disaster experiences, previous living and economic conditions, and demographic vulnerabilities that impacted post disaster outcomes. In particular, the mothers who faced the most negative impacts of the disaster exposures had demographic factors that may have increased their disaster vulnerability, including being single/divorced/widowed, African American, and low income.

These factors may have contributed to the economic and emotional strains mothers faced, along with the experiences of discrimination and stigma during displacement.

These demographic vulnerabilities shaped and were shaped by mental and physical health problems in mother's households. The most vulnerable women and children also experienced severe, direct and secondary disaster induced problems including: long and unstable displacements; stigma during displacement; displacement to shelters; unsanitary shelters and hotels and/or cramped housing; loss of home, social support networks, and jobs, often simultaneously or in short order; unsafe living conditions; and uncertainty about disaster impacts to impeded coping and recovery.

Although all the mother-child pairs in this study endorsed in the WaTCH survey that they had experienced three or more disasters that had a major impact on the child and on the household, Hurricane Katrina and the BP Oil Spill stood out as the most detrimental disasters. Katrina, in particular, set many of the mothers and children on a downward spiral of loss that they were, in some cases, never fully able to recover from. Katrina was especially detrimental in terms of driving longer and more geographically distant displacements, generating job loss among adults and school disruption among children, and initiating strife between partners and other family members. The BP Oil Spill was more financially damaging to the households in this study, but it too took an emotional toll, as most of the families had not yet recovered from Katrina five-years prior when the oil spill occurred.

The current study indicates that older children, possibly because of their better recall and understanding of the disaster exposures, remembered facing hardships and feeling worried more than the younger children. Furthermore, in this study, children in general were more likely than mothers to discuss the positive impacts the disasters had on them, their families, and their

communities; with most of the children stating that their cities became stronger, their families became closer, and they felt more responsible, mature, selfless, and prepared because of the disaster experiences. Thus, younger age seemed to work as a buffer against disasters' impacts in this study.

Regarding education and children, the children who only missed a few days of school, were not placed into multiple schools in a short period of time, and lived in areas that had school procedures to help students make up missed school hours, had fewer negative academic outcomes. Alternatively, when children were forced, by disasters and displacements, to attend multiple schools and the students and teachers in these schools made children feel "isolated" and "different," or even "bullied," children had a much more difficult time adjusting to school and making new friends. However, despite negative school adjustments, some of the children in this study were still able to achieve above average academic performance, receiving honors, scholarships, and/or valedictorian statuses. Further, those children who had academic achievements, notwithstanding school adjustment problems, attributed this success to their parent's consideration and involvement in their academic lives. As briefly noted earlier in this chapter, parental support is crucial for children's ability to cope and recover from disasters. This is true, not just in regard to academic support, but also in terms of parental consideration of children during and after disasters; with some of the children in this study describing how important and appreciated parental consideration and guidance was for them in times of disasters.

In terms of the households, those with higher incomes demonstrated more adaptive capacity and less disaster related problems for the mother-child pairs and their families; having more money made home repairs quicker, evacuations easier, and displacements shorter, more

stable, and more comfortable. Extra-familial assistance post disaster also helped reduce disaster impacts and facilitated coping and recovery. The families who did receive this form of assistance described how it helped them in a various of ways, including providing them places to stay for low or no cost during disaster displacements and providing them much needed food, water, and supplies. Extra-familial assistance may have also helped lessen or prevent problem pile ups for some of the families in the current study.

Familial social support in this study was largely associated with better outcomes for mothers and children. Children perceived having closer family ties and more social support than mothers did. In addition, mothers discussed family turmoil at higher rates than their children, recalling how this turmoil was primarily related to relying on family for housing during displacement or the broken romantic relationships that folded under the strain of the disasters and displacement. Hence, while familial social support was relied on by most of the families, particularly those with less income, it was a source of both joy and turmoil.

The loss of familial social support during or after a disaster, tended to negatively impact families' abilities to cope and recover from disasters. However, the level and types of impacts were dependent on whether the loss was caused by separation or death, whether separation was permanent or temporary, whether or not families knew how long the separation would last, how close the person was to those they lost, if the separation was generated by work, divorce, or incarceration, and how many losses a person experienced.

When considering the research in its entirety, this thesis illustrates that the nine mother-child pairs were generally resilient when it came to multiple disaster exposures, if they had the material, financial, and social support to shield them from harm and to help them bounce back from the multitude of disaster impacts. When these mitigating conditions were in place,

participants were able to show some adaptive capacity to disasters, accumulating lessons from each experience, which helped them prepare, both materially and mentally, for future disasters. Along with the boost to preparation skills, these experiences reduced levels of uncertainty in regard to disasters, lessening the impacts future disasters had on these participants. In contrast, when there were multiple, concurrent, and severe adversities, these adversities enhanced each other, creating a pile up of problems that was not just additive, but was exponentially made worse with each new disaster. This problem pile-up seriously slowed disaster recovery, enhanced the impacts of future disasters, and made future disaster coping and recovery more difficult for some participants.

Implications

There are steps that local and federal governments can take to help reduce problem pile up and increase people's adaptive capacity and overall resilience. As indicated in the current study and previous research, disasters unveil social inequalities and may amplify previous problems and vulnerabilities, especially in regard to income, employment, and housing. Thus, the best way to lessen the economic and social costs of disasters is to invest in social services before a disaster occurs, including work sources, affordable housing programs, and financial assistance programs. Further, the implementation of policies in schools, particularly in disaster prone areas and surrounding locations, which assist students in making up missed school time and help displaced students adjust to and feel welcome in new schools, is paramount to mitigating against disaster and displacement related academic problems.

News reports, governments, communities, and schools should all attempt to avoid referring to disaster survivors as "refugees" and/or "victims," as this can make them feel unwelcome and discriminated against, making recovery collaboration more difficult. Finally, if

governments invest more money in recovery for large scale disasters, specifically for the most disadvantaged groups and in the areas of school, employment, transportation, and housing, they can reduce the long term negative impacts of disasters, as well as enhance adaptive capacity, reducing community needs in response and recovery for future disasters.

Future Research

The current study was qualitative in nature because, while this form of research is not generalizable and cannot examine national trends related to disasters, it can help to understand how disasters impact people, why disasters impact people differently, and in what ways outliers vary from the general population. As a result of these benefits, I would suggest that future research incorporate more qualitative work regarding multiple disaster exposures, while utilizing quantitative data to further understand trends regarding this topic. Studies like the current one should be conducted on a larger scale, with a nationally representative sample, and on entire families, rather than just mothers and one child. Based on the findings of this study, I would also suggest that more research be conducted on: children and the long term impacts of cumulative disasters; the impacts of age differences in cumulative disaster exposures; problem pile ups; demographic intersectionality in disasters; stigma and discrimination post disaster; the impacts disaster displacement distances, locations, times, and lengths have on children and adults; parental support and children's school adjustment post disaster; post disaster school system changes and bullying; and the impact of multiple disaster exposures on children's academic success and problems.

The field of disaster research has made great progress in the past few decades, but with the growing intensity, scope, and frequency of some extreme disaster events, the current study and future research are vital for understanding and mitigating against the negative impacts these

events can have. Indeed, the U.S. will continue to experience extreme events, and it is important that we learn from them so that we can better mitigate their consequences. Those children and families who have already been exposed to many disasters have much to teach the rest of the world.

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APPENDIX

Appendix A – Questions Utilized from the WaTCH Surveys

Wave 1 - Child Surveys

- When the oil spill first occurred in April 2010, did you smell oil? How Often Did you smell the oil?
- In thinking about the other children you know, would you say that your family was...
 - affected less by the oil spill than others
 - affected about the same by the oil spill as others
 - hit harder by the oil spill than others
- In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?
- Since the BP Oil Spill have you helped with any fundraising efforts to support those affected by the oil spill?
- Since the BP Oil Spill have you helped with any wildlife or animal rescue activities since the oil spill?
- Since the BP Oil Spill have any of the organizations you are a part of—like a local church or 4-H club—helped out with the oil spill?
- Since the BP Oil Spill have you had to help out more around your house because of the oil spill?

Wave 2 - Child Surveys

- What type of school are you in now? What grade are you in now?
- Please tell me how much of the time the statement is true, from 1 to 6. “1” means none of the time, 2 would means true a little of the time, 3 some of the time, 4 a lot of the time, 5 most of the time, and 6 all of the time.
 - I think I am doing pretty well.
 - I am doing just as well as other youth my age.
- In the past year, did you
 - Have any in-school suspensions
 - Have any out-of-school suspensions
 - Get expelled from school
 - Drop out from school?
 - Get arrested?
- During the past year, did you
 - Smoke cigarettes
 - Drink alcohol
 - Use drugs or medications that were not prescribed for you
- Overall, how would you rate your health?
- Since April 2010, were you ever hospitalized overnight, even if it was not related to the oil spill? Why were you hospitalized?
- Were you pregnant during the past year?
- In the first two years following high school, which of the following do you think you are likely to do? If you have already graduated or left school, please indicate which is closest to what you are doing now
 - Go to college
 - Attend a vocational/technical program
 - Work at a job
 - Join the military
 - Stay home and care for my family (siblings, parents, or grandparents)
 - Stay home and start my own family
 - Other _____

- Do you have at least one adult in your life who gives you emotional support or is otherwise there to comfort you when you need it?
- Do you have at least one adult in your life who gives you advice and offers access to information?
- I would like you to think about the adults you trust to give you advice or information. Do you get adult guidance about:
 - Present schooling
 - Future schooling
 - Future job or career opportunities
 - Family relationships
 - Friendships with peers
 - Extra-curricular activities
 - How to be a leader
 - How to keep a positive outlook
- How many adults do you know who can help you make connections within your current community?
How many adults do you know who can help you make connections outside your current community?
- Do you think you will live in this community as an adult, or do you imagine yourself moving somewhere else?
- Is this statement true or false: I am proud to be part of my community.
- Which of the following disasters has your household experienced?
 - For each of the disasters that you just listed, can you tell me how much of an impact it had on your life. On a scale of 1 to 5, with 1 being “no impact,” and 5 being “major impact,” how much of an impact did each disaster have on you personally?
 - In thinking about the same disaster, how much of an impact do you think it had on your household and family?
 - Hurricane Katrina in 2005
 - Hurricane Rita in 2005
 - Hurricane Gustav in 2008
 - BP Oil Spill in 2010
 - Hurricane Isaac in 2012
 - Other

Both Wave 1 and 2 - Child Surveys

- State whether the following statement is “Certainly True”, “Somewhat True”, or “Not True”
 - I am restless. I cannot stay still for long.
 - I get a lot of headaches, stomach-aches, or sickness.
 - I get very angry and often lose my temper.
 - I worry a lot
 - I am helpful if someone is hurt, upset, or feeling ill.
 - I am constantly fidgeting or squirming.
 - I have one good friend or more.
 - I am often unhappy, depressed, or tearful.
 - Other people my age generally like me.
 - Other children or young people pick on me or bully me.
 - I get along better with adults than with people my own age.

Wave 1 - Mother Surveys

- Since the Oil Spill on April 20, 2010, at any time have you lived in a place that you consider permanent and stable, that is, a place that you think is NOT temporary?
- Was [CHILD] involved in cleanup activities during the Oil Spill?
- Compared with before the Oil Spill, would you say [CHILD’S] health **now** is better, worse, or about the same?

- How would you describe [CHILD]’s school performance **now** in reading or English and Math classes? How would you describe [CHILD]’s school performance in reading or English and Math classes in the year **prior** to the Oil Spill?
- Have you, or someone in your household, received any money or gift cards from BP since the Oil Spill?
- During the past 6 months, has a case manager, case worker, or any other paid employee of an agency helped you with services?
- In thinking about where you live now (your home), please tell me if you have experienced any of the following problems in the last month...
 - Peeling paint
 - Broken windows
 - Broken or missing window screens
 - Broken or dangerous steps
 - Broken or missing locks on the doors
 - Graffiti in public spaces
 - Leaking roof
 - A lot of rats or mice
 - Other serious problems with your home?

Wave 2 - Mother Surveys

- In the past year, did [CHILD]
 - Have any in-school suspensions
 - Have any out-of-school suspensions
 - Get expelled from school
 - Drop out from school?
 - Get arrested?
- During the past year, how often did [CHILD]
 - Smoke cigarettes
 - Drink alcohol
 - Use drugs or medications that were not prescribed for you
- Generally speaking, how would you characterize your child’s situation since the oil spill? Would you say that...
 - It is better than it was before the oil spill
 - It is back to where it was before the oil spill
 - It is worse than before the oil spill
 - The oil spill had no impact on your child?
 - You are unsure, things are still changing
- Which of the following disasters has your household experienced?
 - For each of the disasters that you just listed, can you tell me how much of an impact it had on your child’s life. On a scale of 1 to 5, with 1 being “no impact,” and 5 being “major impact,” how much of an impact did each disaster have on you personally?
 - In thinking about the same disaster, how much of an impact do you think it had on your household and family?
 - Hurricane Katrina in 2005
 - Hurricane Rita in 2005
 - Hurricane Gustav in 2008
 - BP Oil Spill in 2010
 - Hurricane Isaac in 2012
 - Other

Both Wave 1 and 2 - Mother Surveys

- Do you consider where you are living now to be a permanent, stable place to live? Do you think you might have to move again within the next year?
- In general, how would you describe [CHILD'S] health?
- Has a doctor or health professional **ever** told you that [CHILD] has... If Yes, was that since the Oil Spill?
 - Diabetes
 - Depression or anxiety problems
 - Behavioral or conduct problems
 - Any developmental delay or physical impairment
 - Asthma
 - Any other serious health conditions we haven't talked about? E.g., Cancer, heart problems, major skin conditions, other disabilities
- Since the Oil Spill, has [CHILD] had
 - A cough?
 - A wheezing or tightness in the chest?
 - Shortness of breath?
 - Watery, burning, or itchy eyes?
 - A stuffy, itchy, or runny nose?
 - Burning in the nose, throat, or lungs?
 - A skin rash, sore, or blister that lasted three or more days?
 - Dizziness?
 - Severe headaches or migraines?
 - Nausea?
 - Blurred or distorted vision?
 - Excessive fatigue or extreme tiredness?
 - Diarrhea?
 - Constipation?
 - A sore throat?
 - Seizures?
 - Memory Loss?
 - Inability to concentrate?
- Since the Oil Spill, did you seek medical help for [CHILD] for any of these problems listed above? Where did you go for help?
- What kind of medical or health insurance does [CHILD] have, if any?
- Is there someone now you could take [CHILD] to for routine checkups, vaccinations, or medical tests?
- I'm going to read a list of problems children might have experienced after the Oil Spill that they didn't have before the Oil Spill. Please let me know if [CHILD] has experienced this, and if it is an ongoing problem.
 - Been very sad or depressed
 - Felt nervous or afraid
 - Had problems sleeping
 - Had problems getting along with other children
 - Had other emotional or behavioral problems? (specify below)
- Did [CHILD] attend school or receive formal schooling at any point during the past school year? Where does/did [CHILD] attend school?
- During the past 12 months, how many times has [CHILD]'s school contacted you or another adult in your household about any academic or behavior problems he/she was having at school?
- Does [CHILD] have a health problem, condition, or disability for which he/she has a written intervention plan called an Individualized Education Program or IEP?
- For each item, please let me know if it is Not True, Somewhat True, or Certainly True. In the last six months [CHILD] ...
 - Has been considerate of other people's feelings
 - Has been restless, overactive, cannot stay still for long

- Often complains of headaches, stomach-aches, or sickness
- Shares readily with other youth, for example books, games, food
- Often loses temper
- Would rather be alone than with other youth
- Has been generally well behaved, usually does what adults request
- Has had many worries or often seems worried
- Has been helpful if someone is hurt, upset, or feeling ill
- Has been constantly fidgeting or squirming
- Has at least one good friend
- Often fights with other youth or bullies them
- Has often been unhappy, depressed, or tearful
- Has been generally liked by other youth
- Easily distracted, concentration wanders
- Has been nervous in new situations, easily loses confidence
- Has been kind to younger children
- Often lies or cheats
- Has been picked on or bullied by other youth
- Often offers to help others (parents, teachers, children)
- Thinks things out before acting
- Steals from home, school, or elsewhere
- Gets along better with adults than with other youth
- Has had many fears, easily scared
- Has had a good attention span, sees work through to the end?
- In general, how well do you feel you are coping with the day-to-day demands of parenting and raising children?
- In the last three (3) months, how often has it happened that there was not enough money in the household for....
 - Rent or mortgage
 - Utilities (e.g., gas, electric)
 - Food that you and the family should have
- I would like to find out how concerned you are about the following issues in your neighborhood. For each statement use this scale of “1” to “10”. “1” means that you are rarely or not worried and “10” means that you are frequently or very worried.
 - Drug dealers or users hanging around
 - Having property stolen
 - Walking alone during the day
 - Letting children go outside during the day
 - Letting children go outside during the night
 - Being robbed
 - Being murdered?
- For the following neighborhood problems, please tell me how often they are found in your neighborhood. For this scale, “1” means that it’s rarely a problem and “10” means it’s frequently or always a problem
 - Litter or trash on the sidewalks or streets
 - Graffiti on buildings and walls
 - Abandoned cars
 - Vacant, abandoned, or boarded up buildings
 - Houses and yards not kept up
 - Drunks hanging around
 - Gang activity?

Appendix B – Child Interview Script

Child Interview Script

- How old are you and what grade are you currently in?
 - Tell me about your family, how is your relationship with them?
 - Do you have any siblings; if so how old are they and how is your relationship with them?
- We're going to ask you to tell the story of each of these disasters and then you also marked off that several of them had a major impact on your child's life, and also on your family.
- Tell me about your experience during Hurricane Ivan and how it impacted you and your family
 - Tell me about your experience during Hurricane Katrina and how it impacted you and your family
 - Do you think Katrina is still unfolding in people's lives here?
 - Tell me about your experience during Hurricane Rita and how it impacted you and your family
 - Tell me about your experience during Hurricane Gustav and how it impacted you and your family
 - Tell me about your experience during the BP Oil Spill and how it impacted you and your family
 - Did you smell the oil?
 - After the oil spill, did you get involved with any helping efforts or did you do anything related to that?
 - Was there anything unique to this disaster that was not present in the other disasters you were exposed to?
 - Tell me about your experience during Hurricane Isaac and how it impacted you and your family
 - Did your routine change as a result of the disaster, if so how?
 - Where did you live during the disaster and did you change your permanent residence as a result of the disaster?
 - If so, how did you feel about the move?
 - Did you have family living close by at the time of the disaster?
 - Did the disaster cause any home or other material damage?
 - Did you evacuate during the disaster?
 - If you did, what was this experience like for you and your family?
 - How, where, and for how long did you go?
 - What, if anything, did you take with you when you evacuated?
 - If you did not evacuate during the disaster, what was the experience like for you and your family?
 - Were you separated from any family during and after the disaster? If so, describe the experience and feelings you had?
 - In general, how did you feel during and after the disaster?
 - After the disaster, did you feel like you needed something that you didn't have?
 - Is there anything that you wished you would have had that would have helped?
 - Did you miss any school during the disaster?
 - If so, how much time did you miss and were you able to make it up?
 - How disruptive was it?
 - How was the transition back to school?
 - Did the environment of the school change after reenrollment?
 - Have you had friends or classmates who were deeply impacted by the disaster and/or had to move away because of the disaster?
 - How do you think the disaster impacted your community in general?
 - Of all the disasters that you and your family have been through, which one would you say has had the most long-term or enduring impacts on your lives? Why?
 - Have you lived through any other big disasters or other major disruptive events besides the ones we asked about on the survey?
 - Did you have any health issues before, during or after any of the disasters?
 - If yes, where any health ailments that you had related to or worsened by any of the disasters?
 - Do you help out more around your house when there is a disaster? If so, what are some of the things you do?

- During these different disasters, who do you or what do you turn to when you need support or help?
- Do you talk to your friends or family about disasters and getting prepared?
 - If so, what are these conversations like?
 - Do you think these conversations help you cope with the disasters?
- What does it mean to live in a place where you get repetitively struck by disaster, what do you learn from that?
 - Has living through multiple disasters has changed you or your family, if so, how?
 - Has it changed you or your family's outlooks on the world and where you might want to live in the future?
- Do you think that having to go through a disaster at that age, did it make you grow up or become more mature?
 - If yes, how so?
- What do you think are the most important things that have helped protect you, support you, and allow you to snap back from these events?
- If you had any lesson that you would share with a young person somewhere else, what is the lesson you would want to teach them about responding or recovering from a disaster?
- Do you and your family have a plan if another big disaster hits?
- Is there anything that you do specifically to prepare for a disaster?
- What would you take with you if you had to evacuate again from a disaster?
- In school do you have lesson plans or is there any kind of curriculum around disasters, where you learn about the effects of disasters or how to prepare?
- How are you currently doing in school and at home?
- What are your future aspirations?
 - What do you want to do after high school?
- Do you see yourself staying in Louisiana in the future? Why or why not?
- Do you remember doing both of the surveys for the WaTCH studies?
 - If yes, did they come here and do the WaTCH studies with you?
 - What was the experience like doing the survey?
 - How was doing this kind of interview versus doing a closed end survey? Do you prefer one over the other?
 - Have you ever been in a research project before?
- Is there anything else you want to say or want to share?

Appendix C – Mother Interview Script

Mother Interview Script

We're going to ask you to tell the story of each of these disasters and then you also marked off that several of them had a major impact on your child's life, and also on your family.

- Tell me about your experience during Hurricane Ivan and how it impacted your children and family
- Tell me about your experience during Hurricane Katrina and how it impacted your children and family
- Tell me about your experience during Hurricane Rita and how it impacted your children and family
- Tell me about your experience during Hurricane Gustav and how it impacted your children and family
- Tell me about your experience during the BP Oil Spill and how it impacted your children and family
 - Did you and/or your children smell the oil?
 - Did you feel any non-direct ripple effects during this disaster?
 - Did they talk about this disaster more than others?
 - Was there anything unique to this disaster that was not present in the other disasters you were exposed to?
- Tell me about your experience during Hurricane Isaac and how it impacted your children and family
 - How many children do you have and how old were your children during the disaster?
 - Did you and your children's routines change as a result of the disaster, if so how?
 - Were you or the children's father working during the disaster and did these employment statuses change as a result of the disaster?

- Did you suffer any economic hardship as a result of the disaster?
- Where did you live during the disaster and did you change your permanent residence as a result of the disaster?
 - If so, how did the children respond to the move?
- Did you have a means of transportation during the disaster?
- Where did you live during the disaster and did you rent or own your home?
- Did you have family living close by at the time of the disaster?
- Did the disaster cause any home or other material damage?
- Did you evacuate during the disaster?
 - If you did, what was this experience like for you and the children?
 - Was evacuation mandatory?
 - How, where, and for how long did you go?
 - What, if anything, did you take with you when you evacuated?
 - Was there a time in which you didn't want to go back to New Orleans after evacuating?
 - If you did not evacuate during the disaster, what was the experience like for you and the children?
- Were you and/or your children separated from any family during and after the disaster?
 - How did you and your children cope with this separation?
- Did your children miss any school during the disaster?
 - If so, how much time did they miss and were they able to make it up?
 - How disruptive was it?
 - How was the transition back to school?
 - Did the environment of the school change after reenrollment?
- What was your children's demeanor during and after the disaster?
- After the disaster, did you feel like you needed something that you didn't have?
 - Is there anything that you wished you would have had that would have helped?
- How did the disaster impact your community in general?
- Of all the disasters that you and your family have been through, which one would you say has had the most long-term or enduring impacts on your lives? Why?
- Have you lived through any other big disasters or other major disruptive events besides the ones we asked about on the survey?
- Did you grow up in Louisiana, if so where?
- Did you or your children have any health issues before, during or after any of the disasters?
 - Where any health ailments that you or your children had related to or worsened by any of the disasters?
- What is the level of involvement of the children's father in their lives?
- During these different disasters, who do you or what do you turn to when you need support or help?
- How does your parenting change during a disaster?
- Do you talk to the kids about disasters and getting them prepared?
 - Have your kids ever wanted to talk about any of the disasters?
 - Is it something you feel like is in their mindset generally?
- How has living through all these disasters impacted how you parent your children?
- If you had to give another parent advice or teach them how to be a parent in a disaster, what would you say?
- What does it mean to live in a place where you get repetitively struck by disaster, what do you learn from that?
 - Has living through multiple disasters has changed you or your children, if so, how?
 - Has it changed you or your children's outlooks on the world and where you might want to live in the future?
- Do you have a plan if another big disaster hits and do you think that you would come back afterwards?
- What do you think about the increase in the number of disasters in the past 11 years?
- How are your children currently doing in school and at home?
- Do you currently feel safe in your community, why or why not?

- What is your gender, racial identity and generally how would you describe your family income (not in numbers but how would you place yourself in the U.S. economic system)?
- Is there anything else you want to say or want to share?