

OLDER ADULTS AND NEW ORLEANS: MOBILITY AND PLACE ATTACHMENT
AFTER HURRICANE KATRINA

by

DONESHIA PATRICE STARLING

(Under the Direction of Velma Zahirovic-Herbert)

ABSTRACT

Did place attachment have an impact on the mobility decisions of older adults post-Hurricane Katrina? This exploratory study used data from the American Community Survey (ACS) to examine why older adults chose either to stay in New Orleans or remain in their homes; or why they returned back to their homes shortly after Hurricane Katrina (one year later) by looking at multiple contributing factors associated with place attachment.

The empirical model used for analysis looked at factors related to economic security and social influences attributed to place attachment, while controlling for a number of demographic and socioeconomic variables. The results showed that while both age and having grandchildren decreased the likelihood of older adults to either remain in their homes, or return shortly after Hurricane Katrina, there are still policy implications that are important for older adults wanting to age in place.

INDEX WORDS: Place Attachment, Aging in Place, Sense of Place, Disadvantaged groups, Vulnerable Populations, and Economic Security

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DEDICATION

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CHAPTER 1

INTRODUCTION

Background

Years after Hurricane Katrina, the demographic face of New Orleans has changed based on the type of residents deciding to remain or depart for various reasons. There had been much speculation, in addition to reported observations of families who chose to remain in catastrophic and unsettled areas of New Orleans shortly after the hurricane. In 2007, a Kaiser Post-Katrina Baseline Survey showed that although both younger and older residents responded they planned to stay in New Orleans, in actuality, a greater number of younger residents responded that they “seriously planned or considered moving away from New Orleans” (“Who will stay and who will go?” (para. 3). Many of the younger residents who planned or considered moving away from New Orleans, perhaps left New Orleans due to the decline in their communities, and the labor market. Most likely, these younger residents were better off financially and physically; therefore choosing to leave for more promising economic opportunities elsewhere.

On August 29, 2005, Hurricane Katrina reached a category-5, shattering nearly 100,000 square miles of land associated with the Gulf Coast states (Louisiana, Mississippi, and Alabama). While the Gulf Coast states are amongst the poorest in the nation, the impact of Katrina was felt greatest in the city of New Orleans. Roughly over one million residents were forced to leave their place of residency, while many homes and infrastructures were damaged due to massive flooding (Rudowitz, Rowland, &

Shartzter, 2006). Of the devastating shock left by Hurricane Katrina, the majority was most experienced among homeowners and renters, as they sustained dramatic damages and home loss due to massive flooding.

Homeowners and renters at a greater inconvenience were categorized into, “disadvantaged groups.” Fussell (2011) stated “disadvantaged groups are more vulnerable to housing damage from a disaster than advantaged groups” (p. 2).

Disadvantaged groups are those individuals who lack the tools and resources for basic human survival. More specifically, the categorization of disadvantaged groups included the vulnerable populations of New Orleans because of their high poverty rates, and low income status. A 2005-2006 RAND study found that outside of social networks and physical constraints, housing damage was the greatest obstacle to the repopulation of New Orleans. This challenge was considerable, especially among the most vulnerable populations that included lower income blacks, older adults and renters.

Hurricane Katrina changed the population structure of the Gulf Coast states and region because it impacted the residential mobility decisions for many residents. The effect of forced eviction on residential mobility would impact the economic and social circumstances for older adults living in Gulf Coast states. This effect would especially affect the decisions of older adults who either remained in their communities, due to their place attachment, or moved away from their homes altogether.

The older adult population (persons 65 and older) is one of the largest and fastest growing populations in the United States; outgrowing children and the young adult population. Not only is the older adult population growing at a faster rate, this population is living longer, and will continue to grow at rapid rates into the 21st century. In 2004,

there were approximately 50,000 residents living in New Orleans (Zedlewski, 2006). Of the 50,000 residents living New Orleans, about 11 percent were 65 and older—“the same percent of older persons living in Louisiana and the United States” (Zedlewski, 2006, p. 2).

In 2010, older adults comprised 12% of the population in New Orleans; a small increase from 9 percent in 1980 (Plyer, Ortiz, Pettit & Narducci, 2011). The demographic breakdown of older adults in New Orleans in 2010 showed 68% percent to be White; 24% percent were Blacks (non-Hispanic); 5% were Hispanics of any race; 2% were Asian and Pacific Islander (non-Hispanic); and others, mostly non-Hispanic were only 1% (Plyer et al. 2011). However, more astounding were the future predictions of the increase of older adult households after Hurricane Katrina.

By 2020, it was forecasted that of the New Orleans metro population, “older adult headed households would increase by 34% (an increase of 8,800 older adults)” (Plyer et al. 2011, p.4). With such an expansion in growth, this would create huge implications on both national and local levels, while also impeding on the quality of life for older adults. This impact could have negative consequences such as economic decline, increased poverty, and disruptions in residential lifestyles amongst older adults. Such was the case, for a geographical area like New Orleans. This city, which is prone to hurricanes, not only has a growing vulnerable population of older adults; the city also has one of the highest poverty rates in the entire nation.

In 2010, the U.S. poverty rate was 15%, which was lower than the poverty rate in New Orleans, which increased from 21% to 27%. As categorized by Carroll, Alteras, and Stepnick (2006), vulnerable populations are “low-income individuals, uninsured persons,

immigrants, racial and ethnic minorities, and the elderly” (p. 9). For the residents of New Orleans, however, the most vulnerable included older adults, individuals with disabilities (both physical and mental), and unemployed single mothers (Zedlewski, 2006). Of those individuals with disabilities, older adults in New Orleans were more likely to report a disability than older adults living elsewhere; providing that “in 2004, 56% of the older adult population (28,195 people), self reported a disability, compared to 46% of older adults in the state of Louisiana; and 40% of the U.S. national average” (Zedlewski, 2011, p.2).

The older adult population was one of the most vulnerable populations hardest hit by Hurricane Katrina. A 2006 report by AARP mentioned that older adults and persons with disabilities face different risks during natural disasters than the remainder of the general population. These risks include higher disability and higher chronic illness rates, combined with lower mobility rates and a lack of access to transportation. According to research by Sherman and Shapiro (2005), 65% of the older adult households did not have transportation to evacuate or properly escape the storm. Unfortunately, transportation would be a determining factor in the life or the death of those who were able to escape.

For those who were able to leave, they evacuated the city with a great deal of uncertainty regarding when they would return (Zedlewski, 2006). For the many individuals who lacked access to transportation; many of them most likely died during Hurricane Katrina. A 2006 report by AARP estimated that 1,330 people, many of who were older adults, died as a result of Hurricane Katrina. Of the 1,330 killed, 71% were age 60 and older, while 47% were age 77 and older (Gibson & Hayunga, 2006).

Throughout the last century, the distribution of the U.S. population aged 65 and older has seen a tremendous increase (Rice & Fineman, 2004). This demographic shift, termed “population aging,” is a general demographic trend in many societies, where there is an increasing proportion of people age 65 and above (Kulcsar & Bolender, 2007, p. 3). In a 2010 article, Brandon reported that in 2011, “the first of 78 million Baby Boomers would have turned 65 years old in the U.S.” (<http://money.usnews.com>). With such a dramatic increase of Baby Boomers, this demographic shift due to population aging will mean many economic and social changes. These changes also involve changing housing needs, because as older adults retire, many of their incomes became limited to Social Security and supplemental pre-retirement incomes. A change in income may mean changes in individual preferences and needs, especially for housing.

Plyer et al. (2011) explained that while the economic growth for jobs in New Orleans looked bleak up through the year 2018, the demand for housing would still increase due to the residents currently residing in New Orleans, rather than newcomers. As forecasted by Plyer et al. (2011), this increase will include households headed by older adults, as by the year 2020 there would be a spike in the “share of the city’s households headed by older adults aged 65 and older “ (p. 4). Ultimately, there is a huge need that will need to be met for the diverse population of older adults and their various housing needs. This is especially true of older adults wanting to live independently and to age in place in their homes and within their community.

Problem Statement

There have been much hearsay and assumptions about residents who said they either would return, or would remain in their homes, compared to those residents who in fact, actually remained in New Orleans after the storm. In a study by Groen and Polivka (2009), they used Current Population Survey (CPS) data that showed an age effect, as a determinant increasing the likelihood of residents returning to New Orleans after the storm.

Unlike many studies on New Orleans residents after Hurricane Katrina, however, Groen and Polivka (2009) primarily focused on economic factors, and not social factors, or both. Still, of the few studies conducted on the residents of New Orleans after the hurricane, they primarily found an increasing age effect to be a determining factor, rather than economic reasons, which were the focus of the study. I am interested in what possible factors related to place attachment influenced the decision of the older adult population to either remain in New Orleans, or return shortly after Hurricane Katrina. Therefore, adding to the limited research that has been conducted on the mobility status of older adults after Hurricane Katrina, this study examined factors associated with place attachment on the decision of older adults to either remain, or return back to their homes shortly after Hurricane Katrina.

Significance

In general, there have been few in-depth quantitative studies have addressed why older adults choose either to remain, or return back to their communities after natural disasters. Prior studies have been cross-sectional, with a primary focus on the mobility and rebuilding of New Orleans amongst the younger populations. In addition, other

studies also focused on improving poverty among single mothers and female-headed households; not older adult households.

The significance of this research is to put the broad trend of aging amidst natural disasters into domestic research by objectifying social aspects like place attachment. Older adults have changing social and economic needs. Therefore, with housing being a vital need, it is important that current research on place attachment and aging in place begin to emerge to include other housing concepts such as needs assessment, housing policies, housing theories, and financing. By understanding what factors influenced the decision of older adults to remain in New Orleans after Hurricane Katrina, future research on how aging, housing and environment models can be adjusted to fit the decision making process of older adults regarding their housing environments after catastrophic events, such as Hurricane Katrina.

This study extends the literature by providing insight for many professionals in areas such as housing, gerontology, social work, health disaster relief, and policy making. Understanding the factors that led to the decision of older adults to reside in New Orleans after Hurricane Katrina is essential for the success of future research on place attachment of older adults.

Purpose of Study

The purpose of this research was to examine factors associated with place attachment as it relates to the decision of older adults who remained, or returned shortly after Hurricane Katrina. To actually determine the effect of place attachment on the mobility patterns of New Orleanian older adults would have been beyond the scope of this research for several reasons (i.e. limitation of variables not supported in dataset).

The specific objectives of the study were to examine how older adults were impacted by short-term post-Katrina economic and social development by conducting statistical analysis of the following:

1. Economic security of older adults in Louisiana.
2. The likelihood of older adults to remain in their homes, or return shortly back to their homes post-Katrina, based on factors related to place attachment.

Research Questions

This research has three research questions that contributed to this study. The specific research questions are:

1. What factors associated with economic security will/will not have a significant impact on the decision of older adult households to remain, or return shortly back to their homes in New Orleans, post Katrina?
2. What factors associated with place attachment will/will not have a significant impact on the decision of older adult households to remain, or return shortly back to their homes in New Orleans, post Katrina?
3. Will old age be a significant impact on the decision of older adult households to remain in New Orleans, post Katrina?

Hypotheses

According to Datta (2004) there are many motives, reasons and factors influencing why people migrate. However, people are not always conscious of the many reasons and factors that encourage their decision to remain in certain conditions after

catastrophic events such as Hurricane Katrina. The research hypotheses can be stated as follows:

1. H1_a: Factors attributed with the economic security of older adult households will not have a significant impact on older adults' decision to remain in New Orleans, post Hurricane Katrina from 2005-2006.
2. H1_b: Factors associated with place attachment will have a positive-significant impact on older adults' decision to remain in New Orleans, post Hurricane Katrina from 2005-2006.
3. H1_c: Using Personal-Environment Fit Theory, old age will have a positive-significant impact on older adults' decision to remain in New Orleans, post Hurricane-Katrina from 2005-2006.

Assumptions

This research was designed with the following assumptions regarding older adults and attachment to their homes:

1. Older adults want to remain in their own homes because they are familiar with their environment; they are attached to their homes and neighborhoods, and they form coping mechanisms for survival during challenging times because of being rooted in a place for a length of time.
2. Older adults are possibly reluctant to leave their home at the time of a disaster because of greater perceived risk due to the lack of knowledge of how to properly prepare for unplanned events such as natural disasters; and also unpreparedness due to the lack of resources they may perceive in unfamiliar territories.

3. Older adults may have possible health issues that impact their ability to relocate because of chronic diseases and illnesses that may make them incapacitated without access to proper transportation.

Definitions of terms

1. Aging in Place- The concept that older adults want to live independently, in their own place of residence or community, for as long as possible.
2. Economic Security- For the purpose of this research, economic security will be defined as, “having access to basic needs pertaining to health, education, dwelling, information, social protection, and work-related security” (<http://ilo.org>).
3. Older adult- For the purpose of this study, an older adult is any individual age 65 and older.
4. Place Attachment- “An affective bond of link between people and specific places” (Hidalgo & Hernandez, 2001, p. 274).
5. Vulnerable population- Individuals who are not able to access and use the standard resources, offered in disaster preparedness and planning, response and recovery. In New Orleans, vulnerable populations include individuals with disabilities (both physical and mental), and unemployed single mothers. Additionally, older adults that were lower-income and considered to have many disabilities were also considered vulnerable.

CHAPTER 2

REVIEW OF LITERATURE

Vulnerable populations, much like older adults, require functioning safety nets for opportunities of survival and recovery. As Zedlewski (2006) explained, rebuilding New Orleans presented available opportunities for vulnerable populations to return because there were several methods of approach. These methods could be used to improve the overall quality of life for older adults by reducing poverty and increasing economic security for older adults who stayed, or returned back to New Orleans due to place attachment to their environment.

Overview

The following paragraphs will provide a clear review of studies that address the concepts of place attachment, aging in place, economic security, and social concerns as they relate to decisions of older adults who chose to remain, or return back to their homes shortly after Hurricane Katrina. Some of the following studies make contrasting conclusions about the relationship, or lack thereof, between economic security, poverty, and aging in place. Included are relationships between poverty and economic security, place attachment, and how the concept of place attachment is relevant to older residents subjected to Hurricane Katrina.

Place Attachment

Many researchers in various studies note the lack of consensus on a formal definition for place attachment (Hidalgo & Hernández, 2001; Casakin & Kreitler, 2008).

The reason, as elaborated upon by Hidalgo et al. (2001), is that there is no standard categorization of the different types of places or dimensions to conceptualize place attachment. For the purposes of this research, however, I will use the definition provided by Hidalgo et al. (2001), which defines place attachment as, “an affective bond or link between people and specific places” (p. 274). This kinship bond between people and specific places is, as Hidalgo et al. (2001) describes, “the tendency to stay close to the object of attachment” (p. 274). However, there is more to place attachment than kinship bonding.

Place attachment also involves the bonding between individuals and their home, which may include different dimensions of the physical environment. This includes the relationship between all the dimensions of the environment, as well as the emotions of the individual attached to a particular environment. I would also add that place attachment involves having a connective experience with social, physical/built, and natural environments. It is the perceptions and experiences the individual forms through the relationship with these various kinds of environments over different periods of time, which forms an attachment to place. Unfortunately, individuals and their attachment to different places and environments can become altered because of many life changing events, such as Hurricane Katrina.

Wright and Storr (2009) explained that “natural disasters and man-made disasters can dramatically alter the physical and social landscape” of a place (p. 618). This not only disrupts an individuals’ sense of place and familiarity with that place; but, there are also disruptions in the relationship the individual has with the environment and their connected networks (family, friends, and places) within that environment. The disruption

caused by a natural disaster on the relationships between an individual and the environment ultimately alters the psychological perception of future outlooks regarding a sense of place, or familiarity with that place.

Lawton (1980) explained that the main point in understanding an individual's psychological condition and behavior is to look at the relationship between the individuals' behaviors and their environments. Simply put, looking at the decision of why residents (i.e. older adults) chose to stay, or return back to New Orleans shortly after Hurricane Katrina, would require greater understanding of the various factors attributed with place attachment. These factors attributed with place attachment would include, the natural and built environments, the culture of New Orleans; and social networks. Through researching place attachment in relation to the natural and physical environments, it would also be important to examine the relationship between housing and culture, which are also a determining factor in place attachment.

Furthering the discussion on the interrelationship between individuals and their environments as it relates to place attachment; Lawton (1980) explained that there was a high correlation between an individual's social life, age, and environment. This social interaction with the environment can be explained by culture. In research by Lee and Parrott (2004) on cultural background and housing satisfaction, their results showed national origin to be significantly correlated with various housing features. Culture was also significantly correlated with overall housing satisfaction. This finding offered further support because groups that share common/related national origins will share social characteristics (i.e. culture that includes language, history, values etc).

Culture as explained in detail by Lawton (1980, p.xii) was conceptualized in numerous ways:

1. A way of life that is typical of a group.
2. A system of schemata transmitted symbolically.
3. A way of coping with the ecological setting.

In Louisiana, culture is essential to what makes the city of New Orleans special. According to the Institute for New Orleans History and Culture at Gwynne- Mercy College, New Orleans is a melting pot of many ethnic groups, including Native Americans, French, African, and Caribbean Islanders (<http://gmc.edu>). The melting pot of ethnicities is also represented in the culture of New Orleans through the food, music, architecture, and language (<http://gmc.edu>). It is this unique mix of culture and familiarity with the environment, which can offer an explanation as to why older adults would want to remain in their communities after Hurricane Katrina. Older adults were also native to the geographical landscapes of Louisiana; they had experience with the environment and surviving previous natural disasters. They were also familiar with their living environments, neighborhoods, and communities; all of which makes for an interesting relationship between culture and housing.

As further explained by Lawton (1980), culture compliments housing because there are many types of dwelling settings; common to all individuals. For the residents of New Orleans, housing and culture can be said to be related because depending on the location of an individuals' home in the city of New Orleans; it can be assumed based on the various ethnicities in New Orleans that the influence of culture in the city, would possibly have an impact on housing for the residents there. Each ethnic group in New

Orleans identifies with their particular culture, and incorporates their culture into bringing meaning to their homes and neighborhoods.

For the residents of New Orleans, place attachment was possibly a generating factor why many residents chose to stay after Hurricane Katrina. This was because of their emotional, psychological, and social connections and their attachment to sense of place, neighborhoods, blocks, and communities. In research by Wright and Storr (2009), their data suggested sense of place and other unique characteristics not found anywhere else, was a reason residents of New Orleans returned after the hurricane. Wright and Storr further added that sense of place was very important due to concepts related to environmental psychology (e.g. place attachment, place identity, and place dependence).

Similarly, Hidalgo et al. (2001) also explained that place attachment was an important factor influencing place identity and sense of community (e.g. neighborhoods, streets, blocks etc.). As with any individual, being a native to a particular environment would also influence place identity and place dependence because of familiarity with the environment. It also affects adaptation and how an individual interrelates with the environment for survival, like residents of New Orleans and their survival mechanisms for hurricane seasons.

Place attachment is influenced by place identity subjected to the connection between humans and their environmental (Ujang, 2008). This is because as Ujang explained, place identity is founded in “a setting,” which is more than a physical, social, or psychological environment place. In other words, there is an awareness of meaning, character and emotions that become intertwined within a constructed place. The setting or

place then becomes much more than a functioning, physical building; meaning and a sense of significance, and identification begin to form.

In a study by Bow and Buys (2003) on residents who resided in a particular locality, the researchers defined sense of community (SOC) as, “a theme exploring how individuals not only interact with their social setting; but how they connect and are influenced by their setting” (p. 3). The researchers also found, attachment to “sense of community,” which included both social bonding and natural environment aspects (p. 14). In support of this research by Bow and Buys (2003) on attachment to “sense of community,” Casakin and Kreitler (2008) also presented that individuals form bonds and links based on their interactions with their environments. These emotional bonds include “familiarity with a particular place; the expectations to reside in the same place, the possessions of a home and the length of stay (rootedness) in the particular residence” (Casakin et al. 2008, p. 81).

And lastly, as it relates to a sense of community and place attachment; further research by Groen and Polivka (2009) found that older residents and homeowners were more likely to return back to their homes in New Orleans after Hurricane Katrina because of their attachment to the area and the relative cost of living in their particular area. This can be attributed to the processes of “belonging and agency,” “two important processes of aging in place” (Oswald, Werner, Wahl, Mollenkopf & Hieber, 2006, p. 7).

Place Attachment and Personal- Environment Fit

Oswald et al. (2006) explained that the “process of belonging accounted for the full range of subjective experiences, while the process of agency suggested more objective behaviors” (p. 7). Concepts included in the “process of belonging” were

residential satisfaction, place attachment and meaning of home; while more environmental concepts (e.g. environmental press/docility, environmental richness/proactivity and person-environment fit) are concepts related to the “process of agency” (Oswald et al. 2006, p. 8).

Although place attachment is a subjective concept, the goal of this research is to apply an objective approach by testing objective factors that relate to place attachment. Therefore, for the purpose of this research, focusing focus will be on the objective factor, not the subjective aspects of place attachment primarily due to the measurement tools within the datasets provided.

In exploring multi-dimensional aspects of the home environment and other housing-related factors as determinants for older adults within personal settings, the ENABLE-AGE Project (2004) also examined both objective and subjective factors for determinants of different housing perspectives at old age. Included in the subjective factors were: the “meaning of home, housing-related control belief and housing usability” (p. 7). In contrast, objective perspectives included factors such as “housing conditions, housing standards, environmental barriers, housing accessibility and operationalizing accessibility as an aspect of person-environment fit” (p. 7).

Lastly, the ENABLE-AGE Project also introduced a social and community perspective that was used to determine different housing perspectives at old age; this included “social support and community participation” (p.7). The social support and community participation interrelates to the concept, “process of belonging,” because the subjective measurements of the factors in that category can also be considered social concepts. However, these two subjective concepts and perspectives, “process of

belonging,” and “social support and community participation,” are possible reasons residents of New Orleans chose to remain, or return after Hurricane Katrina.

The ENABLE-AGE Project determined that accessibility was an aspect of person-environment fit. Two concepts previously mentioned, belonging and agency, are concepts also important within the person-environment exchange framework in later life. These two concepts are important because of their relationship with residential satisfaction to a particular place. Additionally, belonging and agency are also integral in the person-environment exchange framework are important because of their relationship with place attachment. Person-Environment fit (P-E Fit) plays an important role within the concept of place attachment because of the two concepts: place and agency (Oswald et al. 2006).

In the Person-Environment Fit framework, the correspondence between individual preferences or needs, and environmental presses, cultivate environmental satisfaction and psychological well-being (Kahana, Lovegreen, Kahana, & Khana, 2003). Similar to research by Oswald et al. (2006) on the subjective and objective measures of housing at an older age, Kahana et al. (2003) further explained the utilization of the PE-Fit theory in their research, which was to examine the impact of neighborhoods and dwelling units on the residential satisfaction for older adults.

While they did not directly examine place attachment of older adults in relation to housing; the goal of Kahana et al.'s (2003) research was to look at each of the components of P-E Fit as independent factors to see the influence on residential satisfaction for older adults. Therefore it can be assumed that the P-E Fit Theory incorporates multiple concepts like the (SOC) research from Bow et al. (2003); research

by Oswald et al. (2006), and the ENABLE-AGE Project because of the many similarities in housing and environmental concepts.

Similar to Kahana et al. (2003), I am also going to use objective factors mentioned in the ENABLE-AGE Project to serve as environment and personal factors within the P-E Fit framework to examine if age was a determining factor of older adults remained in New Orleans after Hurricane Katrina. A variable from the American Community Survey dataset that will serve as an objective factor in this research will be the dependent variable, mobility status, which measured if respondent were non-movers or movers within a one year period. The remaining variables will be a mixture of social and demographic variables.

Aging in Place

Research by McCarthy, Petersen, Sastry and Pollard (2006), explained that the new composition of New Orleans after Hurricane Katrina was an important topic of discussion among policymakers within the City, the whole state of Louisiana, and the federal government. The new composition of older adults who remained in the city, as well as those who returned back to the city, was just as important based on a single factor, aging in place.

As mentioned by Pyler et al. (2011), older adults want to remain in their homes, for as long as they can. The concept of aging in place refers to older adults preferring independent living in their own place of residence, or community for as long as possible. Pynoos, Nishita, Cicero, and Caraviello (2008) also added that “aging in place,” refers to the desire of older people wanting to remain in their homes and communities, despite having illnesses, or disabilities. These infirmities include the interrelation of housing and

health of older adults; health disparities and disabilities that are often costly, thus creating difficulty for older adults to age in place, due to a lack of resources. Additionally, “encroaching infirmities” can also include living in an institution, much like a nursing home where there is less independent living, and higher rates of health disparities and disabilities.

For the vulnerable residents of New Orleans, “encroaching infirmities” possibly pose a major concern because as forecasted by Pyler et al. (2011), “by the year 2020, there will be more than 12,000 older adults with “moderate or serious disabilities” living at home needing local and national policies and programs to aid in their aging in place process” (p. 4). These policies and program include many things such as an increase in the accessibility to housing stock, home improvements such as the inclusion of wheel chair ramps, and widened doors, and the endorsement of universal design.

The concept of aging in place is fairly new, and has many subjective and perceived meanings. Becker (2003) explained that the type of space occupied by older adults can impact multiple and crucial areas of their lives because meaning is attached to places they call “home” (p. 130). As further explained by Becker (2003) the type of space occupied by older adults have different spatial components, such as “health, safety, comfort, privacy, functional ability, independent living and social supports,” that may be disturbed in the lives of older adults (p. 129). Furthermore, as recalled by Oswald et al. (2006) “meaning of home,” is a subjective concept related to the “process of belonging.”

Mynatt et al. (2000) explained that while there are many factors contributing to older adults wanting to age in place, a basic starting point to determine if older adults can live independently is to assess “everyday functioning” because independent residents

must be capable of performing basic activities of daily living (ADLs) such as bathing, toileting, and eating (p. 2). Furthermore, aging in place also requires that individuals be capable of managing their instrumental activities of daily living as they pertain to the management and maintenance of a household (e.g. managing a check book, managing a medication regimen, meal preparation, and maintaining a household).

Managing a household could also mean adapting to a changing environment, such as changes in geographic territory, much like the changes after Hurricane Katrina. This is because changes in geographic territories would require older adults to manage and maintain their new households in new environments after the destruction caused by Hurricane Katrina. Likewise, as further explained by Mynatt et al. (2000), individuals who adapt to changing environments must be willing to accept challenges and learn to “stay fully functional in a changing environment,” thus producing additional behaviors (p. 2) such as survival skills for daily living and preparedness for future natural disasters.

Changing environments must also be livable environments for individuals to age in place. Lawler (2001) noted, “When a living environment is affordable and appropriate, an aging individual is more likely to remain healthy and independent” (p. 1).

Additionally, aging in place strategies work best as part of a complete and holistic approach, to provide health care and housing program options to support the needs of older individuals, to live independently (Lawler, 2001). These combined health care and housing program options support aging in place through four key components: choice, flexibility, mixed generations, and calibrated support (Lawler, 2001).

Although older adults want to age in place, Pynoos (2001) stated that “over 90% of the older adult population living in conventional single-family homes and multi-units

did not have housing stock that was designed to meet their needs” (p. 4). This presented challenges because there were large portions of older adults that were homeowners.

Research by Pynoos (2001) explained that while individuals between the age of 62 and 74 had a homeownership rate of 81.2 percent; individuals between the age of 75 and 84 were slightly lower at 76.9 percent.

In a 2010 survey by AARP, results showed that “88% of older adults reported wanting to remain in their current residence for as long as possible, while 92% of older adults 65+ stated they really wanted to remain in their local community for as long as possible” (p. 4). Therefore, with the rapid growth and increase of the aging population, it is important to take notice of the concept of aging in place within older adults’ places of residence and local communities because of economic and social benefits.

Aging in place is an important aspect of public policy due to the increasing number of the American population that are aging and the constantly changing needs associated with population aging. Therefore, the public policy implications should identify and understand the many ways multi-disciplinary academic fields can connect with the study of gerontology in understanding the importance of aging in place for older adults, and promoting policies that do the same.

The policies that promote aging in place have positive benefits that make it worthwhile for implementation. Pynoos et al. (2008) explained that there were “social and financial benefits to programs that support aging in place for older adults to live in their neighborhoods and communities” (p. 78). As aging in place policies are implemented, this would, as Plyer et al. (2011) explained, reduce substantial numbers of older adult decision makers from being forced to leave their historical homes and

neighborhoods, thus decreasing the chances of neighborhood “abandonment and blight”(p. 12). Future research should look at how aging in place reduces blight, increases property values, and improves overall neighborhood conditions.

There are social benefits associated with aging in place, which present both challenges and opportunities. According to a 2010 AARP study, “staying in one’s community had many social benefits (e.g. proximity to friends/family, closeness to the grocery stores, doctor offices and the library)” (p. 9). Similar to the research by Bow and Buys (2003), and Ujang (2008) looking at a setting/place as more than a functional building, Pynoos et al. (2008) also said that “The home is more than a physical structure” (p. 79). Thus for older adults, the home provides a sense of familiarity and identity because of personal meanings and utilization of housing functions.

Further explained by Pynoos et al. (2008) was how older adults formed identification through housing. According to Pynoos et al., when older adults reside in one particular place for an extended period of time, many attachments (i.e. emotional, cultural, and spiritual connections) form between family members, friends and their surrounding environments. Therefore, the influence between aging and different environmental and geographical territories is important in understanding how older adults age in place in relation to natural disasters, such as Hurricane Katrina.

There is no one-size fits all type of environment. Different types of environments have different dimensions (e.g. physical/material, social/cultural and psychological). These different types of environments have impacts on how older adults age in place. Peace, Wahl, Mollenkopf and Oswald (2007) explained that the physical/material environment consisted of natural landscapes, open spaces, and the built environment that

are developed over time. The social environment included the relation of people to places, and guidelines on how to use the physical/material environment, while the psychological environment combines both the physical/material environment and social environment to show how people felt about their selves.

Displacement and Aging in Place

As previously mentioned, the aftermath of Katrina posed huge challenges with the new population composition of New Orleanians that either remained or returned. This meant looking at reasons why those who stayed chose to stay/return. For the purpose of this research, this implies looking at factors why older adults remained in their homeland of New Orleans, after the storm.

The challenge in understanding the decision for older adults who chose to remain in their pre-hurricane residence after forced eviction because of Hurricane Katrina requires examination of the interaction between individuals, their social structures and natural disasters. This can help exemplify the magnitude of the impact natural disasters have on evacuation, economic and social consequences and the decision to migrate back home. This has important consequences for older adults because as people age, they become comfortable with the familiarity of their community and environment, thus becoming less mobile. Gilleard et al. (2007) explained that not only do older adults become less mobile; there are also fewer chances that they will alter their residential location as they are familiar with their surroundings and age in place there.

Socio-economic status and being in a minority group are key important factors in recovering after disasters. Most vulnerable groups in concentrated poverty areas recover slower and not as completely, as compared to less impoverished and advantaged groups.

This fact could be seen in previous news articles, and research on the racial and social structures manifested in New Orleans, from Hurricane Katrina. Research conducted by McDonald and James (2007) found race to be contributing factor to older adults remaining in their community. In their research, older adults who were Caucasian were less likely to remain in the community; unlike older adults identifying as Black, or Hispanic, who were more likely to remain in their community (p.14). This is also consistent with the findings of Groen and Polivka (2009), who found that unlike whites, blacks were less likely to return to their homes after Hurricane Katrina because of the damage caused by the hurricane.

McDonald and James (2007) explained that the in-depth body of knowledge associated with aging in place is more attributed to health indicators, not socio-economic, neighborhood or policy factors, which are scarce. They further mentioned that much of what is already known regarding the determinants of aging in place in a community are based on research that uses functional and cognitive based scale assessments. However, findings show that socio-economic and housing neighborhood determinants (e.g. social capital, civic engagement, gentrification displacement, formal and informal supports systems, and neighborhood and housing conditions) all played a key role in older adults aging in place (McDonald et al. 2007).

Defining Economic Security

Economic security is a concept that lacks an operational definition. When referring to economic security, income/financial security and economic well-being are all used interchangeably to describe the concept of economic security. Income security, a broad term used by Prahbu (2001), was based on socio-economic security, which

examined how to enhance the social capabilities of vulnerable populations for survival through improvement to their income levels, or economic security through asset, employment and social assistance programs.

Many older adults, who are on fixed incomes, incur financial consequences that are much direr than for younger individuals because many older adults do not have pensions, retirement accounts, investment accounts, or even savings. Additionally, living off a fixed income means that there is a little chance of income increasing, while the cost of living continues to increase. Thus the lack of diminished finances presents challenges to survive with basic necessities (e.g. food, clothing, shelter and utilities). Hence, the cycle of poverty continues to decrease household welfare because there are no safety nets (finances or assets) left for replenishing for survival. Compared to the poverty levels of women in the United States, in 2005, almost twice the percentage of women in New Orleans had incomes below the poverty level (14.8% and 26.5% respectively) (Willinger & Gerson, 2008). More importantly, older adults who were considered vulnerable were probably most likely in poverty.

In 2011, there were over 13 million economically insecure, older Americans, living at or below 200% of the Federal Poverty Level (The National Council on Aging, 2011). This equates to an income of \$22,000 or less a year. Due to this small income, older adults are struggling daily to be economically secure and survive to meet basic needs. As explained by the National Council on Aging (NCOA) (2011), older adults are economically insecure due to economic losses resulting from rising housing and health care bills, inadequate nutrition, the lack of access to transportation, diminished savings and job loss (NCOA, 2011). Plyer et al. (2011) noted that in 2010, there were 44% of

older adults in the metro city of New Orleans who lived 200% below the federal poverty line.

Fortunately, there are ways to improve economic security, by improving and stabilizing financial income, through assets and social assistance programs. However, this presents some challenges, because “stable” for one individual is not “stable” for another individual; thus, measurements of economic security become unclear. Financial stability varies from person to person, as well as by geographic location and personal circumstances. However, as mentioned, economic insecurity/financial insecurity means having income at or below 200 percent the poverty level (NCOA, 2011). Therefore, like the older adults in New Orleans, many older adults are literally economically insecure by these standards.

To measure economic security, and build upon the current body of knowledge, The Rockefeller Foundation provided an economic security index (ESI) in its simplest form, as a standard representation for measuring economic security and improving the lives for working American workers and their families. ESI data is provided from the U.S. Census Bureau’s Survey of Income and Program Participation (SIPP), for the available years from 1985 through 2007, given that the last economic downturn was in 2007 (Hacker, Huber, Rehm, Schlesinger, Valletta, 2010). Hacker et al.(2010) mentioned that future data projections were planned for years 2008-2009, with 2009 being the year many Americans experienced the greatest economic loss than any time over the past quarter century (approximately 20 percent of Americans experienced economic loss that was 25 percent or greater in available household income).

Economic Security Limitations

As provided by The Rockefeller Foundation, “the ESI is used as a consistent objective measure that compares economic security of American families across time and across different circumstances” (Hacker et al. 2010, p. i). As specified by Hacker et al. (2010), three important factors, when combined with the ESI, are risks economic to economic security:

1. “Experiencing a major loss in income” (p.i)
2. “Incurring large out-of-pocket medical expenses,” (p.i).
3. “Lacking adequate financial wealth to buffer the first two risks” (p. i).

A major component of the ESI is “available household income,” which is defined as, “income that is reduced by non-discretionary spending, including, most substantially, the amount of a household’s out-of-pocket medical spending” (Hacker et al. 2010, p. i). While the ESI focuses on working Americans and their families, the focus is particularly on the share of Americans who experience at least a 25 percent decline in their inflation-adjusted “available household income,” from one year to the next and who lack an adequate financial safety net to replace this lost income until it has returned to its original level” (Hacker et al. 2010, p. i). Therefore, to be economic insecure would imply an individual having income loss due to an increase in medical expenditures; having income loss that is at least 25 percent or greater; or the combination of having an increase in medical expenses, along with a decline of income that is 25 percent or greater.

This poses an issue for many older adults who are retired, or living in poverty because of fixed and limited incomes. One limitation with the ESI is due to uncertainty within the economy, “ESI rises and falls with the state of the economy, and the higher the

ESI, the greater the chances an individual will be insecure” (Hacker et al. 2010, p. i). The basic underlying principle for the ESI is that it is directly proportional with the state economy, and indirectly proportional with security. The plummet in the state of an economy can have devastating effects on the financial safety net of many Americans, especially older adults. This is important because more than half of all senior households have insufficient financial resources “to meet medial projected expenses based on their current financial net worth, projected Social Security, and pension income” (NCOA, 2011).

According to a statistical profile provided by the Federal Interagency Forum on Aging-Related Statistics (2010), net worth is also an important concept relevant to economic security because it allows a family to maintain its standard of living when income falls due to drops in the economy, health problems, or family changes (e.g. divorce or widowhood). However, this concept of net worth and economic security does not include the life change due to such devastations as natural disasters.

Another limitation with measuring economic security, as mentioned by Fremstad (2010), is that the federal government should adopt a new “nation statistical framework” that encompasses the full picture of both poverty and economic security. The two measures suggested by Fremstad (2020) for a new framework are:

1. A consistent measurement of “low income,” as well as “low-income indicators” used for both programmatic and research purposes (p.8).
2. A “low-income-plus-hardship” measure for economic security (p. 8).

These measures would be beneficial because they would be adjusted over time to reflect improvements in living standards and show individual who would be “at-risk-for-

poverty” (p. 8). However, the economic security of vulnerable individuals is more threatened with life altering circumstances such as natural disasters because it can alter how individuals decided to allocate resources to survive by choosing to move or stay in their place or residence.

Life-course events, such as natural disasters, can impact residential mobility rates of populations within states and regions. Natural disasters also impact the rates of populations that remain within these same states and entire regions. Because many vulnerable residents included older adults, that were of low-income status, and survived off of fixed incomes (e.g. Social Security Income, and other forms of Public Assistance), residential mobility of older adults moving to safer grounds decreased, due to the lack of resources.

As previously explained, the vulnerable population in New Orleans, which included older adults, individuals that were disabled (physically and mentally); and individuals who lacked financial resources and transportation were most likely not able to evacuate during or after Hurricane Katrina. Hence, this may be a reason these individuals were forced to stay after Hurricane Katrina.

Unfortunately, this cycle of poverty, especially after the occurrence of a natural disaster, can have longer term impacts on vulnerable populations, specifically older adults because of overall economic loss (which is fixed and limited to begin with), from incurred debt, and further increasing debt due to limited access and knowledge about information available to allocate the resources available to help extend their current fixed income and other economic and social resources. This was the case for some residents of

the Gulf Coast, especially the most vulnerable and poorest residents, during Hurricane Katrina.

Even more, older adults are the most recognized group deemed among vulnerable populations. Marshall and Mathews (2010) explained that it is not the age of the older adult, which classifies them as vulnerable, it is the combination of age and “what it means to have special needs” that defines them as vulnerable (p.80). These special needs (e.g. access to quality health, transportation and various community resources) which vary among young-old and oldest-old are hard to physically obtain due to limited financial resources; but are dependent upon many varying factors.

Older American Act and Economic Security

Economic security is a very important public policy issue facing the nation today because “the reality of old age has changed over time” (NCOA, 2011, p. 7). This change is attributed to older adults living longer, and possessing stability with health and financial statuses, as these fluctuate in relation to the economy and other life changing circumstances. For this reason, it can be implied that due to changes in the health and financial status of older adults, community and government services are needed to fill in the gaps.

In 1965, Congress passed the Older Americans Act (OAA) to respond to the concerns of policymakers about the lack of community services for older individuals (Administration on Aging, 2010). “The original legislation of the OAA established authority for grants to states for community planning and social services, research and development projects, and personal training in the field of aging” (Administration on Aging, 2010). While the OAA provides services for all older adults, the variety of

nationwide aging services authorized by the OAA are primarily required to target the most vulnerable populations, in the greatest social and economic need.

Today, the OAA supports a national system of aging networks incorporating “56 state units on aging, 629 area agencies on aging, and nearly 20, 000 service providers, 244 tribal organizations, and two Native Hawaiian organizations representing 400 tribes” that serves more than 10 million seniors annually (Administration on Aging, 2010). These 10 million older adults constitute 29.3% and are considered poor according to the federal poverty index. However, using a different index measure such as the Elder Economic Security Index, the percentage of vulnerable older adults was lower than data provided by federal poverty level, equating to older adults being more than destitute than they realized.

The major objective of Title I of the OAA is the establishment of a definition for economic security, albeit, this term is used interchangeably and is also known as well-being, and economic need. Regardless of economic need, definitions of economic insecurity are inconsistently defined by both OAA and NCOA. While the OAA defines an economically insecure individual as living at or below 200% below the federal poverty level; NCOA defines economically insecure older adults as living at or below 250% the federal poverty level (NCOA, 2011). These economic needs for older adults suggest economic security to include income and other resources like basic needs: housing, health care, transportation, food, and when needed, long-term care.

Additionally, as explained by the NCOA regarding economic security for older adults, “at a minimum, the measure must be geographically considered” (p. 14), as well as accounting for other individual life circumstances. These life circumstances, similar to

the recommendations by the Leadership Council on Aging Organizations, include health status, household composition, and housing scenario that also encompass: housing, healthcare, nutrition, transportation, basic household necessities, financial services and long-term care, if necessary (NCOA, 2011, p. 4).

Definition and Measures of Poverty

Poverty is an abstract term to measure because of the many factors attributed to the concept. There are many aspects of poverty that include but are not limited to; poverty levels, poverty thresholds, poverty guidelines, and even, absolute and relative measures of poverty. Nevertheless, measuring the poverty status of individuals depends on the type of research and how a particular researcher intends to measure poverty for individuals and households. Ultimately, the goal is to objectify a comprehensive definition for poverty that will strengthen economic security. A quantifiable way to objectify a definition for poverty is to compare income levels against poverty thresholds. In this research, I will set the poverty level based off the OAA and NCOA baselines of at or below 200% the poverty level, and at or below 250% the poverty level, and test both levels to see if there are any statistical significances at the different levels.

The National Center for Children in Poverty states that the bureaucratic poverty measure is a precise dollar amount that varies by family size, but is consistent globally (Cauthen, & Fass, 2008). However, as with measuring economic security, the challenge with measuring poverty is that it is narrow and exclusive. Similar to Fremstad (2010), Cauthen et al. (2008) argued that the U.S. government measure of poverty is constricted and does not include “other economic status, such as material hardship (i.e. living in subsidized housing, debt; the consideration of financial assets, like savings or property)”

(p. 1). Therefore, as explained by Fremstad (2010), there is no valid framework where poverty reflects true costs of living, and changing living standards of various families and their changing needs.

In research that identified the poorest oldest Americans, Fisher, Johnson, Marchand, Smeeding and Torrey (2009) investigated how to categorize the poorest oldest adults by two measures: income and consumption. In their results, they found that older adults who were “income poor,” but not “consumption poor,” had other assets and resources to finance consumption, such as Medicaid and Supplemental Security Income that put them above the poverty threshold. In essence, income poverty is having enough assets and supplementary income (i.e. Social Security, and public assistance income) to increase consumption above the poverty threshold.

In contrast, older adults who were consumption poor, but not income poor, were in another category; their defined poverty status was based on fewer assets because they saved for “unexpected income or expense shock” (Fisher et al. 2009, p. 758). Older adults who are consumption poor are the opposite of income poor, having fewer assets to put them above the poverty threshold. However, in many cases, older adults who are slightly above the target poverty levels and barely making ends meet, may not qualify for public benefits because each state has different guidelines on what constitutes as poor.

Using the concepts independently, Fisher et al. (2009) developed a different poverty measurement, rather than when the concepts were combined. They provided a thorough and comprehensive outlook on poverty measurement, relative to standard of living. For the most vulnerable residents of New Orleans who were both income and

consumption poor, the decision to leave was not based on if they wanted to leave, rather, they were literally too poor to do so.

As the Federal Interagency Forum on Aging Related Statistics (FIFARS) (2010) reported, although each family member has the same poverty status, the threshold measure given is based on multiple characteristics, such as: family income, family size, and the ages of all family members. Furthermore, different indicators can also determine poverty status. For instance, if income is used as an indicator, a family would qualify as poor if their income was less than 100 percent below the poverty threshold. A low-income family would have income between 100 and 199 percent of the threshold; middle income is between 200 percent and 399 percent, and high income is 400 percent or more of the poverty threshold (FIFARS, 2010). These income indicators are based on a single 65 year old individual. While different indicators will yield different poverty thresholds, as mentioned, income is the most widely used.

AARP (2010) stated that new measures of poverty are needed because the current poverty measures do not include complete information on who is poor, and the information used for adequate and comprehensive measurements are outdated (AARP, 2010). The AARP (2010) then summarized the current poverty measure as underestimating individuals 65 and older; ignoring health care costs; and based food security on outdated information on food consumption patterns. Thus, this flawed measure of poverty poses discrepancies in identifying the poorest individuals, especially when it comes to older Americans.

Fisher et al. (2009) explained that income is the most used poverty measurement in the United States because income data is easier to quantify, understand, and is easily

assessable. However, AARP (2010) pointed out a disadvantage to using income as a comparable poverty measurement was that it disregarded tax-liabilities, health care costs, and other forms of public assistance. These disregarded forms of resources are components in determining higher economic security status.

For the residents of New Orleans, the income effects of poverty posed life or death decisions. Simo (2008) reported that while there were speculation and accusation claims of residents making less of an effort to leave to evacuate, many of the residents were just too poor. They had no choice because “they could not afford to escape or were not provided the necessary assistance to do so” (p. 310). Fussell (2006) explained that for the poorest of New Orleanians who did not evacuate, there were certain factors that simply prevented them from evacuating (e.g. income, age, access to transportation, health, occupations, and social networks outside the city).

More specifically, unlike their upper and middle income counterparts, for the most vulnerable residents of New Orleans during Hurricane Katrina, these factors presented lesser resources (i.e. current assets to leave town quickly, or to even make reservations at hotels, or with family and friends outside the city) (Fussell, 2006). For older adults who were income and consumption poor and living below the poverty level (i.e. 100% or 200%), the decision to evacuate involved much more risk.

According to Plyer et al. (2011), older adults in New Orleans were one of the poorest populations in the U.S. In 2010, they were poorer than older adults in neighboring suburbs in Louisiana (7% living below), and even in the nation (9% living below the poverty) (Plyer et al. 2011). Living below poverty meant that for a single person household, to live 100% below poverty meant an individual was living on \$11,344

annually; whereas, living 200% below poverty was surviving off of \$22,688 a year.

Given the small incomes to survive on, this equated to different evacuation decisions for older adults, especially those with health concerns.

For older adults with disabilities and chronic health conditions, evacuation from the city became a distant reality because as Fussell (2006) further explained, even after critically ill and disabled older adults were temporarily housed in the Superdome and Convention Center, their conditions worsened due to lack of medical attention and medical resources. Thus, some older adults risked the option to reside in their personal home where they had access to medical resources, or risked leaving their homes and all their personal belongings for possible safety elsewhere in the city.

Social Structure Changes of Older Adults Post-Hurricane Katrina

Population structures were not the only thing that changed; family structures also shifted. According to the National Institute on Aging (NIA) and the National Institute Health (NIH) (2007), as the population continues to age and live longer, family structures are also changing. Changes in family structures included increases in household headed by grandparents. In a 2011 MetLife report, they found that in 2010, there were 39.8 million grandparent headed households (one in three households in U.S.); and approximately 4.5 million grandparent headed households had one or more grandchildren (<http://metlife.com>).

As previously mentioned by Plyer et al. (2011), by 2020, the number of older adult households will dramatically increase by 34%. This will result in many housing challenges and implications for older adults wanting to age in place independently. However, there is also a higher risk to meet housing needs for the vulnerable older adults

in New Orleans wanting to also age in place, based off factors related to place attachment. For the purpose of this research, three variables relating to older adult households with grandchildren were added to objectify place attachment and social connection.

Displacement

As previously mentioned, the aftermath of Katrina posed huge challenges with the new population composition of New Orleanians that either remained or returned. This meant looking at reasons why those who stayed chose to stay/return. For the purpose of this research, this implies looking at factors why older adults remained in their homeland of New Orleans, after the storm.

The challenge in understanding the decision for older adults who chose to remain in their pre-hurricane residence after forced eviction because of Hurricane Katrina requires examination of the interaction between individuals, their social structures and natural disasters. This can help exemplify the magnitude of the impact natural disasters have on evacuation, economic and social consequences and the decision to migrate back home. This has important consequences for older adults because as people age, they become comfortable with the familiarity of their community and environment, thus becoming less mobile. Gilleard et al. (2007) explained that not only do older adults become less mobile; there are also fewer chances that they will alter their residential location as they are familiar with their surroundings and age in place there.

Socio-economic status and being in a minority group are key important factors in recovering after disasters. Most vulnerable groups in concentrated poverty areas recover slower and not as completely, as compared to less impoverished and advantaged groups.

This fact could be seen in previous news articles, and research on the racial and social structures manifested in New Orleans, from Hurricane Katrina. Research conducted by McDonald and James (2007) found race to be contributing factor to older adults remaining in their community. In their research, older adults who were Caucasian were less likely to remain in the community; unlike older adults identifying as Black, or Hispanic, who were more likely to remain in their community (p.14). This is also consistent with the findings of Groen and Polivka (2009), who found that unlike whites, blacks were less likely to return to their homes after Hurricane Katrina because of the damage caused by the hurricane.

McDonald and James (2007) explained that the in-depth body of knowledge associated with aging in place is more attributed to health indicators, not socio-economic, neighborhood or policy factors, which are scarce. They further mentioned that much of what is already known regarding the determinants of aging in place in a community are based on research that uses functional and cognitive based scale assessments. However, findings show that socio-economic and housing neighborhood determinants (e.g. social capital, civic engagement, gentrification displacement, formal and informal supports systems, and neighborhood and housing conditions) all played a key role in older adults aging in place (McDonald et al. 2007).

Theoretical Framework

For the purpose of this study, I will use a simple model by Paxon and Rouse (2008), as a reference for the empirical framework of the probability of older adults who chose to either remain, or return, shortly back to New Orleans, post-Katrina. The framework will be used to explain certain factors attributed with economic security as

factors that forced older adults away from their homes after Hurricane Katrina. The framework will also be used to explain factors attributed with place attachment as factors that attracted older adults to either remain, or return back to their homes after Hurricane Katrina.

While the framework looked at the return decisions of New Orleanians after Katrina, the framework can similarly be used to examine factors why older adults remained because if an individual returns back to reside to their homeland due to a particular attachment, the same may be stated why individuals chose to stay, due to similar attachments.

In the Paxon and Rouse model, Hurricane Katrina has two effects on the return decision of individuals. First, individuals experience losses to their location-specific capital based on the degree of destruction from the hurricane. Second, while this may not be an issue of huge concern because older adults generally retire at the age of 65; the hurricane did disrupt employment for those older adults that were able to still work. Although the destruction of physical infrastructures that carried economic resources for older adults (i.e. places of employment, or places that distributed other forms of income and public assistance, such as Social Security and food stamps) could be seen as factor pushing older adults out of New Orleans after the hurricane; individuals received a new pull from the distribution of earnings that carried into the city after the hurricane because of wages within jobs change; or individuals who returned had the opportunity to take jobs that were left vacant by those who did not returned.

Following is a summary of the model applied to my research question. An individual's utility is understood to be a function of their level of income, y , and their

stock of location-specific capital, C. For the purpose of my study, location-specific capital will be defined as the facet of homes, communities, and networks of friends that cannot be easily replaced in other cities; at least in the short run (same as the short-term timeframe, for which my dataset provided information).

Such is the case because of the research conducted on place attachment, and the emotional bond and interaction a person has with their environment. Therefore, location-specific capital in this framework will serve as a proxy for place attachment, and will contribute a social, rather than economic perspective. This is because location-specific capital does not include financial assets or easily-replaced personal property (Paxon et al., 2008).

Furthermore, as specified by Paxon et al. (2008), sufferings in financial security, or easily replaced assets, destroyed by the hurricane were considered sunk costs, which should not have impacted the location decision. However, on the contrary, any losses of location-specific capital (and similar losses of this type of capital), did impinge on the value of living in one location relative to another. Therefore, according to this framework, it can be implied that the loss of any form of economic security (economic/income safety nets) for older adults, should not have persuaded their mobility decision to leave. Rather, it would have been any changes in location-specific capital, which would influence the mobility decision of older adults to remain, return or leave New Orleans, after Hurricane Katrina.

It can be implied that individuals who are native to their geographical territories, would normally favor their homes within their community because of sense of place and familiarity with the environment. Thus, the altering of location-specific capital would

decrease familiarity within the environment; therefore suggesting a decision to locate elsewhere, where place attachment can be identified again. No changes in location-specific capital, increase the probability for older adults to remain, or return back to New Orleans, post-Katrina.

The data in my research will support this with older adults who chose to remain, or return back to their homes after Katrina. With the model I am applying to this research, an individual who lives in New Orleans receives income, Y^{NO} and has a location-specific capital level of C . If she were to leave New Orleans, she would receive an income of Y^O and have a location-specific capital level of zero. This is because I assume that once an individual moves to a new place, they have no location-specific capital to that new place.

Paxon and Rouse (2008) represent their model (see Figure 1), which depicts an indifference curve that outlines the set of points at which an individual is just indifferent between staying in New Orleans and leaving. Figure 1 depicts the suggestion that elements in C —such as networks of family and friends, and attachment to neighborhood communities—influence location decisions. Thus, for instance, an individual receiving a lower income outside of New Orleans would choose to remain in New Orleans because of their high level of location-specific capital, assuming income remains constant. Thus, the argument of social capital benefits outweighing economic costs, could be implemented into the decision making process to return, if non-monetary payoffs are instituted. Social capital refers networks combined with common norms, values and understandings that “facilitate co-operation within or among groups” (<http://www.oecd.org>).

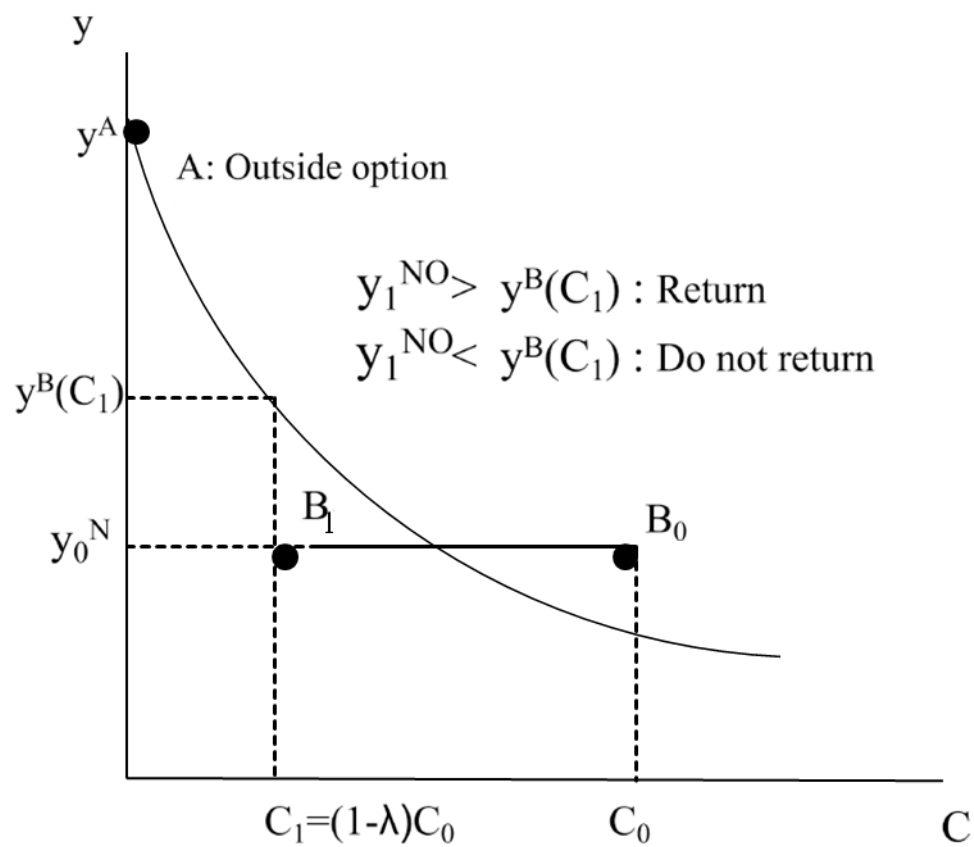


Figure 1. Proposed Theoretical Model.

CHAPTER 3

METHODOLOGY

The study of place attachment impacting older adults' decision to remain after Hurricane Katrina involved quantitative data to address three research questions. The objectives of this study were to examine how older adults were impacted by short-term post-Katrina economic and social development by conducting statistical analysis of the economic security of older adults in the Gulf Coast; and by examining the likelihood of older adults to age in place post-Katrina based off of factors related to place attachment and their decision to remain.

This chapter provides a description of the dataset, the research design, and the data used in this study. Additionally, the method of data analysis used for the hypothesis under examination is explained. For the purpose of this research, I used American Community Survey data collected from 2005-2009. However, the dependent variable was only collected from 2005-2006.

Description of Dataset

The American Community Survey (ACS) was used to obtain data for this current study. The American Community Survey is a nationwide, continuing survey that provides annual data on the social and economic needs of a community, and how communities are constantly changing. The ACS replaced the long form provided by the U.S. Census because the Census is conducted once every ten years; this information becomes archaic after a few years. Thus, information provided by the ACS is a survey similar to the

Census long form, but provides ongoing survey demographic data for communities on an annual basis (Puget Sound Regional Council, 2008).

The ACS is conducted by the Census Bureau and generates data that helps to determine how funds, such as more than \$400 billion within the federal and state are distributed annually. Data collected from the ACS is used by cities and countries to follow the welfare of “children, families, and the elderly, to determine where to locate new roads and transit routes, schools and hospitals; or to show a large corporation that a community has the workforce the company needs” (Puget Sound Regional Council, 2008, p. 2).

According to Puget Sound Regional Council (2008) and Missouri Census Data Center, in 2005, the ACS sampling survey was extended to cover residences in the entire country. This sampling rate covered about 1-in 40 households annually. Unfortunately, persons in nursing homes, prisons, or dormitories were not added until 2006. Additionally, information collected from ACS surveys is used to produce three types of data series estimates: one-year, three-year, and five-year estimates.

Lastly, in regards to data release, the Missouri Census Data Center noted that the procedure for data from ACS surveys for any calendar year has to be published in the late summer of the following year for geographic areas with a minimum of 65,000 populations (<http://mcdc.missouri.edu>). Additionally for populations smaller than 65,000, the Bureau will only publish data based on surveys for multiple consecutive years (<http://mcdc.missouri.edu>). Currently, Missouri Census Data Center explained that there is no new ACS data expected to be released until the 2010 data cycle. The release of this

data usually releases the single-year estimate in September. However, complete 2009 data had already been released at the time of this study.

Research Design

In the Paxon and Rouse model that looked at the return decision of New Orleanians after Hurricane Katrina, the model had two effects on the return decision of individuals. As previously explained, several constraints included individuals experiencing losses to their location-specific capital based on the degree of destruction from the hurricane. For instance, while this may not be a huge issue of concern because older adults generally retire at or by the age of 65; the hurricane did disrupt employment. Therefore, individuals received a new pull from the distribution of earnings that carried through in the city after the hurricane. Individuals receive this new draw because jobs are destroyed, wages within jobs change, or individuals who returned had the opportunity to take jobs that are left vacant by those who have not returned. Therefore, for older adults new monetary income was collected from Social Security, retirement income; or additional income flow from public assistance/social programs.

However, on the contrary, if the physical locations that distributed the additional incomes such as Social Security, retirement income, and public assistance were also destroyed, then this became a constraint to the economic security of older adults because their immediate flow of income from these physical locations (Department of Labor, Department of Children and Family Services and the Department of Social Security and Administration) was halted, due to destruction on these infrastructures

Constraints in determining mobility status of older adults after Hurricane Katrina included total person's income, Social Security, supplementary social security, retirement

income and public assistance income. Therefore, if the economic security for older adults were destroyed, this left social reasons for older adults who stayed, or returned shortly after Hurricane Katrina.

The determinants of net benefits of the mobility status of older adults after Hurricane Katrina included age, marital status, social relationships (if grandchildren resided in the home), responsibility for grandchildren and cultural aspects (place of birth, different language spoken). Some determinants, such as race, education and gender, affect both benefits and costs. Luft and Griffin (2008) state that pre-Hurricane Katrina, housing patterns were evidently determined by factors such as race, gender and class.

Data

The analyses for this study consisted of data from the 2009 American Community Survey (ACS). Using Elliott (2009) as a guide for this study, the data was restricted to households in Louisiana. However, unlike the respondents in the study by Elliott (2009), in this research, the households were individuals age 65 and older. After removing all responses of individuals under the age of 65, a sample size of 33, 094 from Louisiana remained for this study.

Variables

Dependent variable: Mobility Status

Mobility status (lived here 1 year ago), (stayed_or_returned) served as the dependent variable for this study. The variable (stayed_or_returned) measured the mobility status one year after Hurricane Katrina based on their responses, where 1=Yes, same house (non-movers); 2=No, outside US and Puerto Rico and 3=No, different house in US and Puerto Rico.

Independent variables:

Age. Age is a major determinant of place attachment for several reasons. Gilleard et al. (2007) mentioned that conventionally, the perception of older people is that they are less mobile; therefore they are unlikely to change their place or residence or even the habits in how they live. This may be due to sense of place and familiarity.

Furthermore, as explained in the assumptions, older adults want to remain in their own homes whenever possible because they are familiar with their environment (e.g. rooted in their neighborhoods and communities; and rooted in a familiar place for a length of time). More so, age is an important determinant because as also specified in the assumptions, older adults are possibly reluctant to leave their home at the time of disaster because of greater perceived risk based on the lack knowledge on how to properly prepare for unplanned events, such as natural disasters.

Lastly, increases in disabilities and diseases are associated with old age. Therefore, the decision to remain, or leave could have been impacted by access to transportation and having a chronic illness or disability.

Race. Similar to age, race is a major determinant of place attachment. In research that examined place attachment among older residents of all-Black towns of Oklahoma, McAuley (1998) found race to be a significant component. Similarly, Logan explained that the media images of damage caused by Hurricane Katrina focused on those unable to escape; these individuals were predominately poor and black people from black neighborhoods (Logan, 2008).

More so, Sherman and Shapiro (2005) from the Center on Budget and Policy Priorities explained that using Census data, it confirmed that African Americans

contributed to a larger disproportionate percentage of hurricane victims. Furthermore, because many minorities such as African Americans lacked a vehicle, this was probably cause for many African Americans not being able to evacuate. Sherman et al. (2005) mentions that “35% of black households and 59% of poor black households lacked a vehicle, while 15% of non-white Hispanic households in New Orleans lacked a vehicle. Therefore, due to lack of vehicle and poverty reasons, there were probably more blacks forced to remain in their home, than other race counterparts.

Gender. As it pertains to the head of the household, gender is important. In New Orleans, female households twice out-numbered the national rate of men. This statistic also impacted jobs and underemployment by African American men (Luft et al. 2008). In 2007, Black/African American women constituted 55.8% of the Black population in New Orleans; 50.8 % of the white population was comprised of white females; and 50% of the Hispanic/Latinas population was made up of women.

Marital Status. Husband (2005) stated that marital status may be a determinant of attachment to home for older women, especially widowed women. This is in part due to the financial burdens of less income provided by a spouse, which could then put a widow at risk for being in poverty. This therefore puts widows at a higher risk of choosing to relocate (Husband, 2005). While age was not mentioned, Willinger et al. (2008) mentioned that while there was a statistically significant jump in the proportion of never-married women from 2006 and 2007, the overall marital status of women changed minimally following Hurricane Katrina.

Education. The decision for older adults to remain after Hurricane Katrina based on place attachment may be attributed to the level of education as a determining factor.

An individual who achieves a high level of education attainment will normally have employment that will support a complementary salary that can provide the funds for necessary resources such as transportation to evacuate during a hurricane.

Citizenship/Nativity/Place of birth/Ability to speak English/Language spoken at home. These variables may account for some significance in the role of place attachment in the decision of older adults deciding to remain after Hurricane Katrina. An individual that is a citizen and native born has a natural sense of identity, foundation and rootedness in the culture and behavior of their geographic location. This is because they are familiar with the environment, natural surroundings, culture and sense of “their” place. Because they are familiar with their surroundings, they relate and engage with their environment and adapt to the environment when needed.

Grandchildren living in this house/ Months responsible for grandchildren/ Responsible for grandchildren. These variables act as proxy for social capital, and may have an impact on the mobility status of older adults post- Hurricane Katrina. Social capital is an important concept that is important in understanding social networks and the social ties that intertwine within relationships of individuals and their environments. These social networks incorporate people and concepts, such as family, friends, communities and culture play a major role in place attachment. Willinger et al. (2008) acknowledged that the history of New Orleans includes extended families. This includes grand-families, children being taken care of by their grandparent(s), or other relative(s), “who may not necessarily have a legal relationship to the child who is related by blood, marriage, or adoption” (Family Strengthening Policy Center, p. 2). Luft et al. (2008) mentioned that in New Orleans, not only were there twice as many female-headed

households, but, “55% of grandparents were responsible for their dependent grandchildren” (p. 50).

Poverty/Total Person’s Income/Public Assistance Income/Social Security and Supplementary Social Security Income/Retirement Income.

As previously mentioned, economic security variables that include any type of income will contribute as a constraint of place attachment and the role it plays in older adults’ decision to remain or leave post-Hurricane Katrina. However as it relates to poverty, Willinger et al. (2008) compared the poverty levels of women in the U.S to that of women in New Orleans in 2005, and found that women in New Orleans had incomes below poverty levels that were twice that of women in the United States (14.8% and 26.5 % respectively).

The purpose of this research, was to test age, place of birth, citizenship, nativity; race, gender, the ability to speak English, language other than English spoken at home, education marital status; if grandchildren are living in the house, responsibility for grandchildren, months responsible for grandchildren; poverty status, social security income within the past 12 months, supplementary security income within the past 12 months, public assistance income within the past 12 months; total person’s income, and retirement income within the past 12 months to determine the probability of the likelihood that older adults would either stay, or return back to New Orleans, post Hurricane Katrina.

CHAPTER 4

RESULTS

The analysis of this study examines the likelihood of older adults to remain or return shortly after Hurricane Katrina back respondents' possible decision to remain in New Orleans, based off factors attributed to place attachment; as well as, socioeconomic and demographic factors. The data from ACS was transferred into a statistical software program, STATA, where it was then analyzed.

This section presents the estimate of a probit model of the probability of older adults remaining in their home, or returning shortly after 1 year after Hurricane Katrina from 2005-2006. Because this study seeks to relate the probability to stay to its determinants, a probit model allows the dependent variable, mobility status to remain within the range $[0, 1]$ where 1 denotes yes, same house (non-movers) while 0 denoted; no, outside the US and Puerto Rico and no, different house in US and Puerto Rico from 2005-2006. Additionally, the dependent variable also includes all people 1 year and over who did not move during the 1 year as well as those who had moved and returned to their residence 1 year ago. The following independent variables are summarized in Table 1.

Description of Independent Variables

Agep (agep) is represented by ages 65 to 93. All ages less than 65 were dropped by definition of older adult in the American Community Survey to define older adult as anyone 65 and older. I expect the coefficient to be positive, as based on prior research, older adults are less mobile as they age, and want to age in place.

Citizenship status (yescit) is depicted as a dummy variable. A citizenship status of being born in the U.S will be designated by a dummy variable where being born in the U.S is 1 and set zero otherwise. I associate citizenship with sense of place; I predict the coefficient to be positive.

Ability to speak English well (engverywell) is based on one of the following categories: “Very well,” “Well,” “Not well,” or “Not at all.” This variable represents the person’s own perception of his or her own ability to speak English. This variable will be depicted as a dummy variable where very well 1 denotes “very well,” and set zero otherwise. While I associate the variable (engverywell) with identification of culture and community, I do expect the coefficient to be positive.

Language other than English spoken at home (speakanother) was based on if the person sometimes or always spoke a language other than English at home. This variable will be depicted as a dummy variable where 1 denotes yes, speaks another language; and 0 denotes no, speaks only English. Similar to the variable (engverwell), I associate the variable (speakanother) with identification of culture and community. This is because New Orleans is a melting pot, blended with many ethnic backgrounds and cultures. These many ethnicities and cultures include backgrounds of Native Americans, Creole, French, Spanish, Irish, Italian, and African and German descendants (<http://gmc.edu>). I predict the coefficient to be positive.

Marriage (MAR) distinguishes individuals based on one of the following categories: “Married,” “Separated,” “Widowed,” “Divorced,” and “Never-Married.” (MAR) is depicted as a dummy variable, where 1 denotes married; 2-denotes widowed; 3-denotes separated; 4 -denotes divorced, and 5-denotes never-married. As previously

mentioned, Husband (2005) stated that marital status may be a determinant of attachment to home for older women, especially widowed women. Therefore, I will focus only on marriage and widowed; and predict both married and widowed to have positive coefficients.

Married, spouse present/spouse absent (msp) distinguishes all individuals whose present marriage has not ended by widowhood or divorce. This variable will be depicted as a dummy variable where 1 denotes now married, spouse present; 2-now married, spouse absent; 3-widowed; 4-divorced; 5-separated, and 6-never married. Similar to the variable (mar), the variable (msp) may be a determinant of attachment to home for elderly women. Therefore, I will focus on the variable “now married, spouse present, and predict this variable to have a positive coefficient.

Sex, is an important determinant of the mobility status of older adults and their place attachment because as earlier mentioned, in New Orleans, female households twice out-numbered the national rate of men. In this research, (female) of a respondent will be depicted as a dummy variable where a female is 1 and male is 0. I predict the coefficient to be positive.

Race, like gender is an important determinant of the mobility status of older adults and their place attachment. As previously mentioned by Sherman and Shapiro (2005), there were a large disproportionate percentage of hurricane victims that were black. Further, although New Orleans is a melting pot of many ethnicities; in this research, I only focused on the races of black (black_or_racecombo) and white (white_or_racecombo).

As defined by the ACS, (black_or_racecombo) included respondents that were Black or African American recode (Black alone or in combination with one or more other races). This includes a “person having origins in any of the Black racial groups of Africa. It also included respondents who indicated their race as “Black, African American, or Negro;” or provide written entries such as African American, Afro-American, Kenyan, Nigerian, or Haitian. In this research, the race White (white_or_racecombo) was defined as White recode (White alone or in combination with one or more other races). This race combination included persons having origins in any of the original peoples of Europe, the Middle East, or North Africa. White also included respondents who indicated their race as “White” or report entries such as Irish, German, Italian, Lebanese, Near Easterner, Arab, or Polish.

Both (black_or_racecombo) and (white_or_racecombo) will be represented as dummy variables where 1 for (black_or_racecombo) will denote yes black and 0 will not. This dummy variable will also be the same for (white_or_racecombo). I predict (white_or_racecombo) to have a negative coefficient and (black_or_racecombo) to have a positive coefficient.

Grandchildren living in this house (gkidinhouse)/ Months responsible for grandchildren (fiveplusyrs)/Responsible for grandchildren (yesrespforgk), as previously mentioned, are important determinants in the mobility status and place attachment of older adults, post-Katrina because of the structure changes to households. A dummy variable will be depicted for (gkidinhouse) where 1 will denote yes, and set zero otherwise. Similarly, (fiveplusyrs) will be depicted as a dummy variable, where 1 will denote, 5 or more years, and set zero otherwise.

(Gkidinhouse) will be depicted as a dummy variable, where 1 will denote, yes responsible for grandchildren, and set zero otherwise. Based off the statistics mentioned by Luft et al. 2008 that 55% of grandparents were responsible for their dependent grandchildren, I predict the coefficients for (gkidinhouse) (fiveplusyrs) and (gkidinhouse) to be positive.

Place of birth (neworl) is an important determinant in this research because similar to citizenship and nativity, this variable depicts a sense of place and familiarity for older adults and place attachment. This variable in the ACS dataset had respondents select if they were either inside or outside the U.S.; and the state inside the U.S, or the name of the foreign country if outside the U.S. The state code for Louisiana was 22. Therefore (neworl) will be a dummy variable depicted by 22, for Louisiana and set zero otherwise. I predict the coefficient for (neworl) to be positive. Also, (neworl) will be used as a proxy for New Orleans in this research.

Education is an important determinant in this research because income and poverty levels are correlated to education. A dummy variable will be depicted for education as; I focused on respondents who denoted they were high school (highgrad) graduates or had some college, but no degree (somecollege_nodegree). I predict the coefficient for (highgrad) to be positive, and the coefficient for (somecollege_nodegree) to be negative because of having some advanced education which would be linked to more income, and the possibility to attain better resources to evacuate.

Poverty status is an important determinant in this research because as previously mentioned; women in New Orleans had higher rates of incomes below poverty, compared to incomes of females as a whole in the United States. A dummy variable will be

depicted as poverty status was categorized as 0 to 500 percent and over 501 percent.

Therefore, in this research, a poverty status of very poor denotes poverty status being less than or equal to 200%; a poverty status of poor, denotes poverty status being greater than or equal to 250% and less than or equal to 500, and being above poverty level is depicted by being greater than 501%. I predict (verypoor) and (poor) to have positive coefficients because as previously explained, both OAA and NCOA, set definitions for older adults being economically insecure (below 200%, and below 250%, respectively).

Economic security variables like, Social Security income in the past 12 months (ssp), Supplementary Social Income in the past 12 months (ssip), Public Assistance Program Income in the past 12 months (pap), Retirement in the past 12 months, and Total Person's Income (pincp) will include any loss of income, represented by a negative sign. I expect all of these coefficients to be negative because they are constraints to older adults who loss income post-Hurricane Katrina.

Table 1.

Summary Statistics for Demographic Independent Variables

Variable	M	SD	Minimum	Maximum
Agep	74.64	7.26	65	93
Sex				
Male	0.41	0.49	0	1
Female	0.58	0.49	0	1
Race				
White_or_racecombo	0.78	0.41	0	1
Black_or_racecombo	0.20	0.40	0	1
Place of Birth				
New Orleans	0.75	0.43	0	1
Citizenship				
Yescit	0.97	0.17	0	1
Island	0.00*	0.03	0	1
Abroad	0.00*	0.03	0	1
Citbynat	0.02	0.14	0	1
Nocit	0.01	0.07	0	1
Nativity				
Native	0.97	0.16	0	1
Foreign	0.03	0.16	0	1
Speak English				
Very well	0.09	0.28	0	1
Well	0.03	0.16	0	1
Not well	0.01	0.09	0	1
Not at all	0.00*	0.05	0	1
Speak another Language				
Speak another	0.13	0.33	0	1
English only	0.87	0.33	0	1
Education				
Less than H.S.	0.32	0.47	0	1
H.S. Graduate	0.35	0.48	0	1
Some College, no degree	0.15	0.36	0	1
Bachelor plus	0.16	0.36	0	1
Marital Status				
Married	0.54	0.50	0	1
Widowed	0.32	0.47	0	1
Divorced	0.09	0.28	0	1
Separated	0.01	0.10	0	1
Never Married	0.04	0.20	0	1

(Table 1 continues)

(Table 1 continued)

Variable	M	SD	Minimum	Maximum
Marital Status, spouse present				
Spouse Present	0.04	0.20	0	1
Spouse Not Present	0.52	0.50	0	1
Spouse Absent	0.19	0.14	0	1
Widowed	0.32	0.47	0	1
Divorced	0.09	0.28	0	1
Separated	0.11	0.10	0	1
Never Married	0.04	0.20	0	1
GK in the house				
GK in the house	0.04	0.21	0	1
GK not in the house	0.95	0.16	0	1
Responsible for Gk				
Yes, responsible	0.02	0.14	0	1
Not responsible	0.03	0.16	0	1
Months responsible for Gk				
< than 6 months	0.00*	0.03	0	1
6-11 months	0.00*	0.03	0	1
1-2 years	0.00*	0.05	0	1
3-4 years	0.00*	0.05	0	1
5+ years	0.01	0.11	0	1
Poverty Status				
Very poor	0.49	0.50	0	1
Poor	0.30	0.46	0	1
Above Poverty	0.21	0.41	0	1
SSP	8817.83	6031.75	0	50,000
SSIP	265.36	1437.50	0	26,400
PAP	18.43	440.13	0	27,700
PINCP	24887.97	36867.76	-8,736	883,000
RETP	5484.99	12246.05	0	99,000

Note. N=33,094. M= mean; SD= Standard deviation. Gk=Grandkid. *=mean was too low to report, when rounded to the second decimal place.

Analysis and Discussion

The Paxon and Rouse theoretical framework and definitions of the variables results in the following model:

$$\text{Prob(Stay_or_Return)} = f(\text{agep, yescit, engverywell, speakanother, married, widowed, marriedspousepresent, female, white_orracecombo, black_orracecombo, gkidinhouse, yesrespoforgk, fiveplusyrs, neworl, highgrad, somcecollege_nodegree, verypoor, poor, ssp, ssip, pap, pincp, retp})$$

Overall, the model performed moderately. The results are displayed in Table 2. Based on a probit analysis, did reveal that the following variables lived up to their predicted expected signs: Engverywell, Speakanother, Widowed, Married_spousepresent, Female, Neworl, Highgrad, SSIP, Verypoor and Poor, after controlling for a number of demographic factors.

If an older adult spoke English very well, the model suggested that the likelihood they remained, or returned shortly after Hurricane Katrina decreased by 2.4%. An older adult who sometimes or always spoke another language other than English at home, as suggested by the model, they were 1.9% more likely to remain, or return one year post-Katrina.

While the likelihood married older adults who either stayed or returned was opposite of the predicted sign and decreased by 3.5%; having a married spouse present actually increased an older adult's probability by 8.4% to stay in their house one year after Hurricane Katrina, or return and stay one year post-Katrina. Married older adults without a spouse present, was probably a reason there was a decrease in the likelihood of staying, or returning. On the contrary, the likelihood of a widow to either remain in their

home one year post-Katrina, or return or stay in their home 1 year after Katrina was increased by 88%.

While some independent outcomes were positive, and statistically significant; other independent variables, such as agep, black_or_racecombo, engverywell, married, gkinhouse, ssip, pincp, and retp had a significant, negative relationship between the dependent variable (stayed_or_returned). This meant that these variables decreased the likelihood of older adults to remain, or return back to their home in New Orleans based on place attachment.

There were outcome variables that were inconsistent with the stated hypotheses of this research. While place attachment was hypothesized to have a positive, significant relationship on the decision of older adults to remain in New Orleans one year after Hurricane Katrina; one variable associated with place attachment, (gkinhouse) actually had a negative, significant relationship. Other variables that also had opposite predicted signs than expected were age, poverty status, and education. Unlike the research by Groen et al. (2009) that found an age effect to be a determining factor of individuals returning back to New Orleans, my research resulted in the opposite; as being an older adult resulted in a decrease in the likelihood of older adults staying, or remaining after Hurricane Katrina.

Not surprisingly, being an older adult and female increased the likelihood to remain or return post-Katrina due to place attachment by 88%. The likelihood of an older adult born in Louisiana, and choosing to remain in their home, or return back to their home one year after Hurricane Katrina due to place attachment, increased only by 1.3%.

Theoretically, the economic security variables should have been negative because of the devastation to many employment infrastructures, and government infrastructure properties, which provided services to older adults. However, the poverty status showed opposite signs of the predicted signs for older adults who chose to either remain or return back to their homes, shortly after Hurricane Katrina. An older adult who was either very poor (below 200% poverty level), or poor (below 250% poverty level), increased their livelihood to remain or return back to New Orleans after Hurricane Katrina, by 3.6% and 2.8%, respectively.

Lastly, what was surprising, was that the likelihood that an older adult remaining or returning back to their home shortly after Hurricane Katrina decreased by 2.7%, if they had grandchildren living in their home. This was surprising, as grandchildren are a part of social connections (i.e. family networks), and the assumption could be made that older adults would want to stay connected to their close network of family and friends who provide assistance, especially in the case of grandfamilies.

Table 2.

Probit Regression Results of the Dependent Variable

Variable	Dy/Dx	K ²	SE	P>z	Significance
Agep	-.000422	-0.0040688	0.0016706	0.015	**
Sex					
Female	.0082099	0.0783104	0.026539	0.003	**
Race					
White_or_racecombo	-.0127946	-0.131207	0.1014908	0.196	
Black_or_racecombo	-.0262847	-0.2263857	0.1040479	0.030	*
Place of Birth					
New Orleans	.012512	0.1150597	0.0277897	0.000	***
Citizenship					
Yescit	.0224805	0.1877812	0.2167932	0.386	
Nativity					
Native	.0127432	0.1126304	0.2229245	0.613	
Speak English					
Very well	-.0236649	-0.1995947	0.0782509	0.011	**
Speak another Language					
Speak another	.0185485	0.2024139	0.0723796	0.005	**
Education					
H.S. Graduate	-.0044627	-0.0425765	0.0258148	0.099	
Some College, no degree	.0042545	0.0420115	0.0355804	0.238	
Marital Status					
Married	-.0347897	-0.3395306	0.0666914	0.000	***
Widowed	.0088179	0.087144	0.03487	0.012	**
Marital Status, spouse present					
Spouse Present	.0841227	0.7634422	0.0635657	0.000	****
GK in the house					
Yes, Gk in the house	-.0277489	-0.2265445	0.060434	0.000	***
Responsible for Gk					
Yes, responsible	.0046941	0.0469731	0.1398543	0.737	
Months responsible for Gk					
5+ years	.0178712	0.2030892	0.1711321	0.235	
Poverty Status					
Very poor	.0363981	0.3495606	0.0334431	0.000	***
Poor	.0280206	0.296757	0.1696943	0.000	***
SSP	0.000000311	0.000003	0.00000212	0.157	
SSIP	-0.00000141	-0.0000136	0.00000705	0.054	*
PAP	-0.00000352	-0.000034	0.0000182	0.063	
PINCP	0.000000179	0.00000173	0.00000044	0.000	***
RETP	0.000000271	0.00000261	0.00000112	0.019	*

Note. N=33,094. K²=Coefficient, SE= Standard Error, dy/dx= Marginal Effect, and the Pseudo R²= 0.0402. * 0.01 < P < 0.05; ** 0.001 < P < 0.01; *** P < 0.001.

CHAPTER 5

CONCLUSION

For the residents living along the Gulf Coast on August 28, 2005, this date will always be a memorable, historic moment. On August 28, 2005, Hurricane Katrina became one of the strongest hurricanes to ever hit the Gulf Coast, causing massive life changes. These catastrophic effects from Hurricane Katrina were most felt by the residents in New Orleans, Louisiana. There were a large number of deaths; many residents were forced to leave their homes due to massive flooding, and many residents left not knowing if they would ever return.

After Hurricane Katrina, there were many observations, and speculation of who would return, and how the “New” New Orleans would transform. The studies that looked at New Orleans post Katrina, focused on residents that were either displaced, or relocated. Furthermore, many studies conducted post Katrina; have placed a primary focus on vulnerable populations that include younger adult households and children. There have been few quantitative studies that have focused on the residential mobility of older adults, post Katrina. Many vulnerable older adults did not leave, or relocate because they lacked the resources to do so (i.e. transportation, quality health, and financial income). Additionally, for older adults that temporarily left New Orleans due to the Hurricane, they also returned for reasons beyond economic security. This is what the goal of this research; to examine factors beyond economic security that would draw older adults back to their homes in New Orleans.

The purpose of this was designed to examine factors associated with place attachment as it relates to the decision of older adults who remained or returned shortly after Hurricane Katrina. I was interested in this exploratory research because most disaster research on older adults is centered on methodology that is qualitative for explaining concepts such as place attachment and aging in place to explain why older adults return back to familiar locations.

Did place attachment have an impact on the mobility decisions of older adults post-Hurricane Katrina? The results of this research showed that while being an older adult and having grandchildren decreased the likelihood for an older adult to either remain in New Orleans, or return shortly after Hurricane Katrina, there are still policy implications and importance in the variables that were not statistically significant based on the dataset and model used.

Based on the results, black, older adult females were most likely to remain, or return shortly after Hurricane Katrina due to place attachment (increase in likelihood to remain, or return by 88%). While the probability is high for older females to remain, or return to New Orleans due to place attachment, having grandchildren and being responsible for them was not statistically significant in being a prominent factor for older adults to remain, or return post Katrina. However, given the rapid growth of the older adult population and predictions there will be moderate to large increases in older adult headed households, we can also expect to see structural changes in households, with the increase in grandfamilies, as well. Therefore, while older adults having grandchildren was not statistically a significant measure for the model in this research, there are still significant implications for older adults heading households in the future.

Based on the results of this study, the future demographics of New Orleans residents that were most likely to remain, or return shortly after Katrina were older adults that were widowed, or married with their spouse present. While the scope of my research was limited to only examining factors of place attachment that contributed to older adults remaining, or returning shortly after, this research can only assume a few things with why widows and married spouses present increased the likelihood of older adults to remain, or return back to New Orleans after Katrina. First, widows lack spouses, and therefore lack financial resources to access important resources needed. For vulnerable widows of New Orleans, these individuals not only lacked a safety net from a spouse, they were already considered vulnerable because they were poor, had disabilities, and lacked mobile transportation to leave the city of New Orleans during/after the hurricane.

For married older adults with their spouses present, if they were categorized as vulnerable, similar to the status of a widow; married older adults with spouses present had disabilities and lacked mobile transportation to leave. If either the widow or married older adult with the spouse present returned back to New Orleans, it was due to factors attributed to place attachment such as culture, not economic security reasons because they were vulnerable.

Many residents in New Orleans were living below the poverty threshold before Hurricane Katrina. Being an older adult in poverty (very poor, and poor) increased the likelihood of remaining, or returning back to New Orleans shortly after Katrina. This was because many of vulnerable older adults already lacked safety nets to access transportation and other resources to evacuate before the storm hit.

Lastly, culture factors attributed to place attachment, suggested to be positive and statistically significant outcome variables in older adults remaining, or returning back to New Orleans shortly after Katrina. New Orleans is an eclectic melting pot of various ethnicities that are rooted in their heritage that include place of birth, food, and language. Based on the model results, older adults that were born in New Orleans, spoke English very well, as well as spoke another language increased their chances of remaining, or returning back to New Orleans shortly after Hurricane Katrina. While the dataset used in this research did not capture food, and other culture aspects that add to place attachment; place of birth and language variables were substantive enough to suggest that culture is an important concept of place attachment and why older adults wanted to remain, return back to New Orleans post Katrina.

Limitations

Before addressing future research and policy implications, there are some limitations which should be addressed. There were many limitations to the study. First, there is the lack of data provided from 2005, due to displaced hurricane respondents. Another limitation to this study is the issue of sampling bias and the issue of older adult survivors who could not take the survey because they died, relocated, or were hospitalized after the hurricane. Therefore, the negative effect of the hurricane on the overall quality of life may have been underestimated. Third, all subjects in this study, which experienced the hurricane, were not compared to a control group from non-hurricane areas. Hence, it may be impossible to distinguish changes in overall quality of life due to the hurricane, from older adults with a natural time life frame.

Furthermore, additional limitations include datasets lacking long-term measures (longer than one year) of natural disasters, and thus only ask questions that capture short-term effects. Additionally, datasets that measure any type of disaster events should include emotional and psychological variables that relate the individuals' feelings to that event and their environment. This could also involve the dataset including, or having more observations that measure extended variables of the home and community (e.g. housing tenure, length of residence, how long a respondent lived in the home, emotions associated with loss of the home and community). Such variables would provide a quantitative measure for social variables, which are often thought of as only being measured qualitatively. I believe had these variables been available, or extended in ACS; it would have been possible to capture a more empirical understanding of how place attachment impacted the decision of older adults to remain after Hurricane Katrina. These findings would also probe into further policy implications for future research on place attachment and aging in place.

Lastly, other variables that should have been extended in the ACS dataset, as a historical variables (i.e. length of stay was dropped, when I dropped respondents less than age 65 years old; and year home was built was also dropped when I dropped age less than 65); a culture variable that incorporated a social aspect like, "I like the culture of this place;" a disability variable, and a transportation variable should have been added to the ACS dataset to offer more reliable measurements that could have added value to why individuals either chose to stay, or remain in New Orleans after Katrina. There was a transportation variable, but the variable only measured vehicle occupancy, as it related to carpooling to work; while another transportation variable only measured the type of

transportation vehicle to work. Therefore, these transportation variables were irrelevant because they did not offer a basic measurement of “having transportation.”

Future Research

In regards to policy implications, a few suggestions should center on some of these variables and from conventional beliefs. As specified this exploratory study was designed to examine three research questions that contributed to place attachment of older adults of New Orleans, post Hurricane Katrina. Future research and policy implications I would suggest would be to consider a mixed method approach to researching the impact of place attachment in the decision of older adults to remain in their communities after both natural disasters and man-made disasters.

The importance of including a social concept like place attachment of older adults into both soft and hard sciences, is so academic fields such as housing, gerontology, geology, policy health and professional fields can become more interdisciplinary to expand on the knowledge of population aging. Furthermore, mixed methods would combine a *qualitative voice*, with *quantitative evidence* to bring practicality to social and economical challenges within politics. More importantly, by incorporating social concepts like place attachment into academic fields for older adults, policies, like OAA can further be research and implemented to extend to vulnerable populations impacted by natural disasters and other catastrophic disasters, given the changing society and uncertainty of environmental happenings.

Second, given the increase in poverty and grandfamilies in the United States, as well the growing number of grandfamilies in New Orleans, it is important to understand the dynamics, structure and factors impacting the grandparent responsible for the

grandchild to remain in their communities after a disaster occurs. Furthermore, social services that cater to older adults in New Orleans should provide more services and resources to the older adults in New Orleans, so that these items are available. This would be important in helping older adults identify available and accessible resources that would improve the economic security of older adults, thus, helping to reduce poverty levels among older adults.

From past literature and evident from this research, marital status is important in mobility status of older adults choosing to remain in their communities after a natural disaster. This was evident with widows, as it increased the likelihood of older adults to remain or return to New Orleans shortly after Hurricane Katrina. Widows would benefit after a natural disaster, because of the lack of resources from not having a spouse

And lastly, future research should examine at if place attachment is perceived to be a strength or weakness after natural disasters. Although social connections are important to displaced residents and their attachment to their community, preparedness and safety are also important for redeveloping future outlooks on communities and cities.

Additionally, understanding the relationship between age, geography of a location; different housing tenures and structures, and how culture intertwines, future research should also examine comparisons of pre/post perception of place attachment as it relates to aging, housing, geography, and culture; and how all elements related to aging in place. These concepts would be important to aging in place because as the number of older adults continues to expand, research and policies should examine how to properly prepare and nurture various environments for older adults who choose to age in place after natural disasters.

Summary

In conclusion, older adults who decided to remain or return to New Orleans after Hurricane Katrina did so for various reasons. While some place attachment variables like nativity, responsibility for grandchildren, and the months responsible for grandchildren were not statistically significant; they are still important as nativity holds a depth of culture that is undefined because of personal connections. Furthermore, with the rise of grandfamilies, social services in New Orleans would need to understand the relationship between grandfamilies; their needs and how to service these needs as older adults are less mobile and would like to age in place.

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