HURRICANE PREPAREDNESS OF HOMEOWNERS IN THE SOUTHEAST UNITED STATES

By

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To my girls, Megan and Brianna

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LIST OF ABBREVIATIONS

ASCE	The American Society of Civil Engineers (ASCE) established in 1868, strives to propose solutions to maintaining and updating deteriorating infrastructure, pushes for increases in educational requirements of engineering licensure, and encourages the contributions of civil engineers to a sustainable world. ASCE also provides technical guidelines that "promote safety, reliability, productivity, and efficiency in civil engineering" (ASCE, n.d.)
CIT	The Communication Infrastructure Theory (CIT) categorizes communication into neighborhood storytelling networks and the community action context that those networks operate within. Participation in this network and context influences civic engagement and influences individual behavior (Kim and Ball-Rokeach, 2006).
EPPM	The Extended Parallel Process Model (EPPM) is based on fear appeal theory; persuasive messaging intended to scare individuals into changing their behavior or suffer terrible consequences. The EPPM posits that individuals process these messages and proceed in three ways: dismiss the threat and do nothing, take the threat seriously and make adaptive changes to control danger, or take the threat serious and make maladaptive changes to control fear (Witte, 1992).
EST	Ecological Systems Theory (EST). Bronfenbrenner included EST in his early work. It focused on the environment and external factors of the developing individual and saw the first iteration of the micro-, meso-, exo-, and macro-system model. This theory lacked any of the biological factors that are internal to individuals and the time aspect later referred to as the chrono-system (Bronfenbrenner, 1979).
FEMA	The Federal Emergency Management Agency (FEMA) is the US agency whose mission is to support citizens and first responders to ensure that as a nation we work together to build, sustain and improve our capability to prepare for, protect against, respond to, recover from and mitigate all hazards (FEMA, 2015).
GIS	Geographic Information Systems (GIS) are tools for working with spatial data that relates to geographic space. Some of the applications of GIS include urban planning, biology, epidemiology, forestry, and natural hazard analyses (Huisman and By, 2009).

GOES	The Geostationary Operational Environmental Satellite (GOES) is 30+ year joint mission between NOAA and NASA that remains stationary over the equator in the western hemisphere. The purpose of GOES is to monitor weather and other environmental conditions for the NESDIS (GOES Project, 2014).
HPKS	The Hurricane-Preparedness Knowledge Scale (HPKS) is the name given to the first component that resulted from a Principal Components Analysis (PCA) of this study's data.
NESDIS	The National Environmental Satellite, Data, and Information Service (NESDIS) acquires and manages operational environmental satellites and the NOAA National Data Centers. This data is used by various government users from meteorological forecasters to military applications requiring real-time observations (NESDIS, 2014).
NHC	The National Hurricane Center (NHC) is a part of NOAA that specializes in hurricane watching, tracking, and predicting the paths of these disturbances. The NHC is responsible for issuing coastal tropical cyclone watches and warnings for the United States and its Caribbean territories (National Hurricane Center, 2014a).
NASA	The National Aeronautics and Space Administration (NASA) is focused on four principal directorates: Aeronautics, Human Exploration and Operations, Science, and Space Technology. This scope places much more than space exploration and astronauts on NASA's list of concerns (National Aeronautics and Space Administration, 2015).
NOAA	The National Oceanic and Atmospheric Administration (NOAA) oversee daily weather forecasts, climate monitoring, fisheries management, coastal restoration, and supports marine commerce. Their scope of services touches some aspect of more than a third of the United States gross domestic product (National Oceanic and Atmospheric Administration, n.d.a)
PMT	The Protective Motivation Theory (PMT) was created to help explain fear appeals by reducing them to four factors of the appeal: the perceived threat, the perceived probability or vulnerability, the efficacy of the preventative behavior, and the self-efficacy of the individual (Rogers, 1975).
PPCT	The Process-Person-Context-Time (PPCT) model that emerged as Bronfenbrenner developed the EST to give more importance to biological factors and proximal processes (Bronfenbrenner, 2005).

SCT	Social Cognitive Theory (SCT) is based on the belief that knowledge acquisition is directly related to observations and the context in which they occur. Self-efficacy is also a strong factor for learning in SCT as well (Bandura, 1986).
SSHWS	The Saffir-Simpson Hurricane Wind Scale (SSHWS) is the five-category scale that hurricanes are measured by. It is based thresholds for one-minute sustained wind speed at 10m over unobstructed exposure (NHC, 2014b).
TSES	The Trust in Support Entities Scale (TSES) is the name given to the third component that resulted from a Principal Components Analysis (PCA) of this study's data.

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The United States is experiencing the longest drought from major hurricanes on record since 1851. This 10-year absence from major hurricanes has lulled many homeowners into a false sense of security, allowing preparedness to become a waning priority in their minds. Emergency managers across Southeastern Georgia, Florida, and the Gulf Coast are tasked with keeping the public and policymakers prepared at all times for such events.

This quantitative study explored the relationships between demographic characteristics (i.e. location, education, income, and age) and two study-generated measures; the Hurricane-Preparedness Knowledge Scale and the Trust in Support Entities Scale. Through the discussion of several hypotheses, the strength of some indicators was observed while possible reasons for the non (statistical) significance of others was discussed. The implications of this study will add to the body of knowledge on disaster preparedness as well as providing insights into demographic indicators of trust in aid providers.

Findings from this study and subsequent research resulting from it will aid emergency managers and policymakers in better understanding what areas need more

attention while reinforcing those areas that are understood well enough to probe more deeply via advanced discussions regarding preparedness. The findings about support entities will provide insight to what populations may benefit from outreach programs to advance understanding of the aid available to homeowners if needed. A more knowledgeable public that has an increased confidence in the available support will also allow for a more efficient allocation of resources during times of need caused by major hurricanes.

CHAPTER 1
INTRODUCTION

Natural hazards are present throughout the world. From tsunamis to earthquakes, forest fires to tornadoes wherever people live; they are not beyond the reach of these natural hazards. Hurricanes, also known as typhoons or cyclones in other parts of the world, are different from other natural hazards in that their presence can be detected earlier than these other hazards and their predicted paths can give several hours and in some cases, days of warning to populations that may be affected.

Through modern meteorological technology, hurricanes can be tracked in the Atlantic Ocean from their inceptions as atmospheric disturbances off of the coast of the African continent and either weaken or strengthen as they move west towards the Caribbean islands, Central America, and the Gulf and Atlantic coasts of the United States (US) (National Oceanic and Atmospheric Administration, 2012). From early formation to dissipation, this westerly progress can be tracked by the US National Environmental Satellite, Data, and Information Service's (NESDIS) Geostationary Operational Environmental Satellite (GOES). It is possible for a weather disturbance to be tracked, monitored, and evaluated for periods as long as two weeks before landfall (National Oceanic and Atmospheric Administration, n.d.[b]).

When observing patterns where hurricanes have made US landfall since 1900, Southeast Florida and the Florida Keys have the highest number of strikes, followed by Louisiana, Mississippi, Texas, and North Carolina (Landsea, 2015). Despite these areas being more prone to hurricanes, preparedness projects are often neglected by federal, state, and local governments due to cost or low prioritization. For example, the lack of levee upkeep undeniably exacerbated the effects of Hurricane Katrina on New Orleans

(Meyer, 2012). The shortsightedness in avoiding the initial economic expenditures of preparedness is also a gamble against the much larger expenditures repairing, or often times replacing, unfortified infrastructure.

Others have suggested that politics impact decisions about emergency preparedness as much as economics. Healy and Malhorta (2009) and Gasper and Reeves (2011) provided evidence that politicians underinvest in preparation projects because the electoral payoffs are higher for bringing disaster funding to afflicted areas post-disaster.

The Federal Emergency Management Agency (FEMA) recently changed eligibility for federal disaster-preparedness funds and these changes will go into effect March 2016. These changes will require states to include “considerations of changing environmental or climate conditions that may affect and influence the long-term vulnerability from hazards in the state” into their emergency preparedness decisions (Boyer, 2012). This required acknowledgment of changing climates has unfortunately been politicized and would therefore necessitate changes in the current views of the Governors’ offices of Texas, Louisiana and Florida to alter their emergency preparedness decisions (Satija, 2014; Alpert, 2015; Korten, 2015).

Unfortunately, it is not just government entities that are unready and ill prepared. Many residents still do very little to fortify their homes for a hurricane or prepare their families for an evacuation. The Readiness Quotient Public Opinion Survey conducted by the Council for Excellence in Government found that the American public was ill prepared for emergencies of any sort whether natural or man-made (The Council for Excellence in Government, 2007).

Currently, there is added urgency to learning about and overcoming perceived barriers to hurricane preparedness. This is due to the fact that the continental US is currently in the longest running period of time without landfall of a major (Class 3 or greater) hurricane in recorded storm history (Hall, 2015). Based on more than 150 years of historical hurricane data, researchers estimate that a nine-year drought of major hurricanes only statistically occurs every 177 years (Hall and Hereid, 2015). Other studies have shown that risk perceptions of natural hazards deteriorate over time, so it is reasonable to assume that Floridians are less prepared today than they have been in past years (Trumbo, Meyer, Marlatt, Peek, and Morrissey, 2014). 'It's easy to be complacent, but we have to snap ourselves out of it,' says Rick Knabb, director of the National Hurricane Center (Leger, 2012).

With the growing prevalence of Geographic Information Systems (GIS) being utilized by those modeling risk assessments, more is being understood about the vulnerabilities of communities (Taramelli, Valentini, and Sterlacchini, 2014). GIS is not only being used to visually represent data, but advancements are allowing the actual analysis of data to be performed within the GIS software, through geospatial analysis (Taramelli et al., 2014).

Others advocate for emergency planners and policy-makers to use community vulnerability maps to identify and work with high-risk areas for disaster preparation and response (Bergstrand, Mayer, Brumback, and Zhang, 2015). In response to this, the Florida Division of Emergency Management uses GIS technology to display a wide array of information for the public, ranging from evacuation routes to the results of regional planning councils' evacuation studies that show projected sea-level-rise maps (Florida Division of Emergency Management, n.d.).

Rationale for Study

The National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center tracks and records the quantified loss data collected from FEMA's National Flood Insurance Program, the US Department of Agriculture's crop insurance program, the Insurance Services Office/Property Claims Service, and other national and regional sources (Blake and Gibney, 2011). The most costly of this data is aggregated and organized in the "*US Billion-dollar Weather/Climate Disaster Report*" (Blake and Gibney, 2011).

This report only includes events that surpass $1 billion in economic impact. This includes data of various weather/climate hazards including: drought, flooding, freeze, winter storm, severe storm, wildfires and tropical cyclone (hurricane). By categorizing the frequency of these events by decade, it is clear to see that the frequency of these events is increasing (Figure 1-1). Further, it is alarming that the 49 billion-dollar events from 2010-2014 only account for half of this decade (Blake and Gibney, 2011).

This trend shows an increased frequency of all weather and climate events exceeding this $1 billion threshold. Experts posit that the events specifically occurring along the coast will continue to experience increases in their economic impacts. This is due to the increased developmental investments in the coastal plains, the increased population living near the coast, and the gradual rise of sea level (Hinkel, et al., 2013). This means that future flooding and hurricane events will surpass the billion-dollar threshold with increasing frequency in the future.

Although the frequency of these events is alarming, the loss of life is even more tragic. During the course of the 178 events included in this chart, 9,179 lives were lost. The largest death tolls occurred during 2005's Hurricane Katrina (1,833 deaths), 1980's drought/ heat wave (1,260 deaths), and 1999's drought/ heat wave (502 deaths) (NOAA NCEI, n.d.).

Of the type of events recorded in the *US Billion-Dollar Weather/Climate Disaster Report*, hurricanes are commonly tracked and new technologies provide information that enhance warning to coastal residents as they traverse westward. This journey often meanders through the Caribbean past ocean-based observation posts that are able to help predict their severity and direction. By the time these storms make landfall in the US, they often have been monitored for more than a week by satellite, oceangoing vessels, radar, and specialized aircraft (Smith and Matthews, 2015).

Of the hurricanes recorded since 1851, Blake et al. (2007) estimate that 40 percent of hurricanes that affect the US make landfall in Florida. In addition, approximately 60 percent of all Category 4 or higher US hurricanes strike Florida or Texas (Blake, Landsea, and Gibney, 2007). Peacock, Brody, and Highfield (2005) suggest that further education of the public is needed so it can more accurately assess its hurricane risk.

Purpose of Study

The purpose of this study is to examine the associations that socio-demographic characteristics and homeowner perceptions have with hurricane preparedness in Southeastern Georgia, Florida, and the Gulf Coast. The findings will add to what is known about individual homeowners' motivations to prepare (or not prepare) for natural disasters, specifically hurricanes. Given this study's focus on hurricanes, the targeted population will be homeowners living in Southeast Georgia, Florida, as well as in counties near the Gulf Coast of Texas, Louisiana, Mississippi, and Alabama.

To gain insights into homeowners' motivations towards preparedness, socio-demographic characteristics will be explored first and then compared to the findings of previous studies. Next the perceptions of these homeowners will be examined for possible relationships to their views regarding their household level of preparedness. Their views will be mapped to show any geospatial patterns that may be present. This visual representation generated through GIS techniques will increase the understanding of the data as opposed to being solely represented by tables and spreadsheets.

In addition to the homeowners' perceptions of preparedness, this study will explore the associations that socio-demographic characteristics have with the level of trust in the ability of their community, non-profit organizations and federal government to assist during a crisis. Again, these findings will be graphically represented on maps created using GIS techniques.

This increased understanding of motivations or barriers to hurricane preparedness will provide valuable insight to governmental agencies, policy makers, and insurance organizations as they strive to better prepare homeowners and communities for natural disasters. Findings from this study will enable program managers to develop targeted messaging with tailored information that increases homeowner and community resiliency designed to lessen recovery time and/or damage incurred by future storms and hurricanes.

Significance of Study

Although the demographic characteristics of hazard preparedness have been explored by many researchers (Baker, 2011; Becker et al., 2012; Donahue et al., 2014;

Meyer et al., 2015), this only explains a portion of what influences the preparedness decision-making process. Other researchers have explored other factors such as social vulnerability (Bergstrand et al., 2015), risk perception (Peacock et al., 2005; Meyer et al., 2015), and myopic behavior (Kunreuther et al., 2012). Due to inherent differences in individuals (e.g., where they were raised, their occupation, whether they have children, political party affiliation), statistical decision-making models are not intended to explain any process completely. The best that researchers can hope to achieve is to explain more reasons for variation in a particular phenomenon than what current models are capable of accounting for.

Given the abundance of decision-making models that exist for the adoption of healthy behaviors, medical decisions, and even military decisions, it is obvious there is no single, best approach to developing these models. By researching more about individuals' perceptions and personal beliefs, the intent of this study is to explain more about why people vary in their preparation for - and resilience to - hurricanes than has been documented previously.

This study also seeks to make spatial patterns in this data more easily understood by mapping its findings. Morrow (1999) advocated that mapping areas that are more vulnerable to disasters would allow emergency planners and policy-makers to work with these high-risk areas to increase their resilience. There currently exists a gap between data that is available and data that is easily understood and clearly represented; this study will narrow that gap.

Definition of Terms

Disaster	A serious disruption affecting a community or population, causing deaths, injuries, or damage to property, livelihoods, or the environment, that exceeds the ability of the affected

	community to cope using its own resources (UN/ISDR, 2004: 17).
Disaster Preparedness	The International Federation of Red Cross and Red Crescent Societies define disaster preparedness as “measures taken to prepare for and reduce the effects of disasters. That is, to predict and where possible, prevent disasters, mitigate their impact on vulnerable populations, and respond to and effectively cope with their consequences” (IFRC, n.d.).
Disaster Resilience	“A ‘shield’, ‘shock absorber’ or buffer that moderates the outcome to ensure benign or small-scale negative consequences. Indeed, the goal of disaster risk management is to guarantee minimal loss of life and livelihoods and to allow the affected community or system to return to ‘normal’ within the shortest possible time” (Manyena 2006: 438).
Emergency Management	The practice of identifying, anticipating, and responding to the risks of catastrophic events in order to reduce to more acceptable levels the probability of their occurrence or the magnitude and duration of their social impacts (Lindell and Perry, 2004).
Hazards	Physical activities, phenomena, or human activities having potential to cause injury, loss of life, damage to property, economic and social disruption, or environmental degradation (Kapucu and Ozerdem, 2013; Makoka and Kaplan, 2005).
Hurricane/Typhoon	A tropical cyclone in which the maximum sustained surface wind (using the US 1-minute average) is 64 kt (74 mph or 119 km/hr) or more. The term “hurricane” is used for Northern Hemisphere tropical cyclones east of the International Dateline to the Greenwich Meridian. The term “typhoon” is used for Pacific tropical cyclones in the Northern Hemisphere, west of the International Dateline (NHC, 2014[b]).
Individual Resilience	The ability of an individual to maintain healthy psychological and physical well-being despite exposure to adversity (Bonanno, 2004). Individual resilience is partly trait and partly dynamic process that are promoted by two groups of generic factors: 1. Personal attributes such as social competence, problem solving, autonomy, self-efficacy and sense of future and purpose; 2. Contextual, environmental influences such as peers, family, work, school and local community (Boon et al., 2012).

Landfall	The intersection of the surface center of a tropical cyclone with a coastline (NHC, 2014).
Major Hurricane	A hurricane that is classified as Category 3 or higher on the Saffir-Simpson Hurricane Wind Scale (SSHWS) (NHC, 2014[b]).
Man-made or Technological Hazards	These include, but are not limited to, industrial accidents, chemical spills, explosions, acts of terrorism, and fires that are started by anthropological sources (Boon et al., 2012).
Natural Disasters	An event can only be called a disaster if (a) it is triggered by the combination of a natural hazard (or several hazards) and vulnerable local conditions that (b) results in a disruption of the functioning of individuals, a community or society, and (c) requires external assistance for the subsequent impacts to be adequately dealt with (Wamsler, 2014).
Natural Hazards	These include hurricanes, earthquakes, tsunamis, floods, droughts, windstorms, famine, epidemics, and wildfires caused by lightening. (Boon et al., 2012, 383; Rivera and Kapucu, 2015) These hazards cannot be prevented from occurring but are often able to be predicted (Rivera and Kapucu, 2015).
Preventative Behaviors	Any activity undertaken by individuals to prevent a disaster or mitigate the damage done by a disaster (Savoia, Lin, and Viswanath, 2013).
Resilience, Community	The ability to adapt through the redevelopment of the community in ways that reflect the community's values, and goals, and its evolving understanding of external forces with which it must contend (Kapucu et al., 2013, p. 357).
Resilience	"a process linking a set of adaptive capacities to a positive trajectory of functioning and adaptation after a disturbance" (Norris et al., 2008, p. 130).
Risk Perception	"Subjective judgment about characteristics and severity of a risk for the society or individual" (Savoia, Lin, and Viswanath, 2013, p. 176).
Saffir-Simpson Hurricane Wind Scale (SSHWS)	A scale of 1 to 5 categorizations based on the hurricane's intensity at the indicated time (Table 1-1). The scale provides examples of the type of damage and impacts in the United States associated with winds of the indicated intensity.

Table 1-1. Saffir-Simpson Hurricane Wind Scale (SSHWS) (NHC, 2014)

Category	Wind Speed (mph)	Damage
1	74 - 95	Very dangerous winds will produce some damage
2	96 - 110	Extremely dangerous winds will cause extensive damage
3	111 - 129	Devastating damage will occur
4	130 - 156	Catastrophic damage will occur
5	> 156	Catastrophic damage will occur

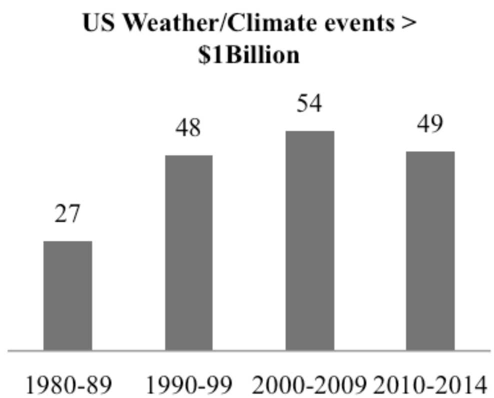

Figure 1-1. Billion $ US Weather/Climate Event Frequency

CHAPTER 2
LITERATURE REVIEW

Theoretical Framework

To examine the interactions that socio-demographic characteristics and homeowner perceptions have on hurricane preparedness, it is imperative to begin with a solid theoretical foundation. A foundation in extant research helps to provide focus throughout this study. Also, understanding what other researchers have empirically tested in the past helps to “connect the dots” between this study’s focus and those conducted previously. In this way, gaps for future research can be identified by discovering new connections that have not been explored in the past (Tudge, Mokrova, Hatfield, and Karnik, 2009).

In reviewing previous studies regarding disaster preparedness, common themes emerged. One of these themes was that disaster preparedness is considered by many to be a knowledge-gaining process that is greatly influenced by contexts of place, personal characteristics, and interactions with environmental factors. Further review revealed components of several theories and models that were prominent and recurring across disciplines. A second common theme was that many of these factors were aligned with various propositions of Bronfenbrenner’s (2005) bioecological theory of human development. This theory and its propositions will be further explained later in this chapter. The bioecological theory’s alignment with these themes and its ability to offer a direction for future research were both compelling reasons for choosing it, rather than the many other possible theories reviewed.

Savoia, Lin, and Viswanath (2013) conducted a systematic review of articles published in 2009 addressing emergency preparedness in public health. In contrast to the understood importance of the expansion of knowledge and theory in existing literature, they found that less than 10 percent of empirical studies published made use of a theoretical framework. These studies included theories that are among some of the most prolifically mentioned in the field of disaster preparedness. These included social cognitive theory, protection motivation theory, extended parallel process model, and the communication infrastructure theory (Savoia et al., 2013).

These four theories are important to this current study because they all have elements that are shared with Bronfenbrenner's bioecological theory of human development--the theory that was ultimately chosen to serve as the framework for this study. By briefly discussing these four theories, the reader can better understand research conducted by others and make connections that to help clarify the process that eventually led to the bioecological theory.

The social cognitive theory (SCT) is a learning theory based on the notion that individuals' knowledge about a subject is directly related to their observations of others and the context in which those observations occur (Bandura, 1986). SCT has been simplified and represented graphically (Figure 2-1) as three categories of factors: environmental, cognitive, and behavior. The environmental factors are those that are perceived as either barriers or encouragements to the successful completion of a behavior. The cognitive factors are individuals' way of thinking and their mindset, often including their level of self-efficacy (i.e., individuals' beliefs about their capabilities to produce results) towards a behavior (Bandura, 1977). Finally, the behavioral factors are the positive or negative reinforcements that an individual receives after completing an action (Bandura, 1986). Bandura (1986) also states that learning and knowledge gain do not imply that behavior change will necessarily follow.

The environmental factors are very similar to what Bronfenbrenner refers to as “context” in the Process-Person-Context-Time (PPCT) Model proposition of the bioecological model. The SCT’s behavior factors align well with the “person” aspect of the PPCT in that thinking, mindset and self-efficacy are internal to the individual and are aspects of Bronfenbrenner’s (2005) “force characteristics.”

The protection motivation theory (PMT) as developed by Rogers (1975), lent understanding to the effectiveness of using fear as a motivation to change attitudes and ultimately, behavior. A simplified representation of the PMT (Figure 2-2) includes perceived severity, perceived probability/perceived susceptibility and efficacy of response as influencing factors of an individual’s motivation to engage in preventive behavior (Rogers, 1975). Perceived severity can be defined as the gravity of the possible hazard. Perceived probability/perceived susceptibility is the likelihood of the hazard affecting the individual. It is important to differentiate this as a perceived probability and not an actual probability. If individuals feel they are at a high or low risk regardless of their actual susceptibility, their belief is what they act on (Rogers, 1975). Perceived efficacy of response can be described as the individual’s belief that the preventive action will lessen or mitigate the affects of the hazard. Again this is based on the individual’s perception not factual efficacy (Rogers, 1975).

Given that the PMT is largely based on individuals’ perceptions, this also aligns well with the person and context aspects of Bronfenbrenner’s (2005) PPCT model. Perceived self-efficacy is one of the force characteristics, but individuals’ perceptions of severity, probability/susceptibility, and response efficacy can be viewed as the culmination of their experiences combined with their intelligence and logic capabilities. Due to this dependence on past experience and knowledge, the “proximal processes” of the PPCT also are involved. These processes rely on repeated increasingly complex interactions of individuals with their environments to facilitate learning (Bronfenbrenner, 2005).

The extended parallel process model (EPPM) was based on the PMT and other fear-appeal theories (Witte, 1992). It is more complex than the previously mentioned theories but still easily understood. The biggest departures from other fear-appeal theories are that the EPPM re-introduced fear as a variable and that it sought to explain why fear appeals are less effective when applied to some individuals (Witte, 1992). As one starts at the left of the graphical EPPM (Figure 2-3), the decision-making process begins with the external stimuli. These stimuli consist of the message components, which are the fear appeals themselves as they are presented to the individual. Once received, the individual begins to process these messages. First, individuals evaluate their perceived threat. If the individual determines there is little-to-no threat, the process stops and goes no further. If a threat is perceived as valid, then individuals assess their perceived self-efficacy and the efficacy of possible responses to the hazard (Witte, 1992). Witte (1992) suggested fear was elicited if the individual perceived the threat to be moderate or high.

The process that individuals take is dependent on their perceived efficacy. If the individual believes efficacy is high, then fear is managed and the danger control process is initiated. If the perceived efficacy of the individual or response is low, then fear pushes the outcomes to follow the fear control process.

Perceptions of the same threat can be different depending on factors of individuals. Many of these factors are part of the person, process, and context components of the PPCT model, as mentioned with the PMT. The EPPM supports that the threat assessment and decision to proceed based on danger or fear is greatly influenced by individuals' experiences, interaction in their environment, and their internal motivations. This further supports the argument for using the bioecological theory of human development in the study of hurricane-preparedness.

Finally, the communication infrastructure theory (CIT) is an ecological approach to explore the importance of storytelling to civic engagement (Kim and Ball-Rokeach, 2006). "The CIT provides a specific method of understanding an ecological relationship between a communication environment and communicative actions by articulating and empirically unveiling the communication infrastructures of diverse urban residential environments" (Kim and Ball-Rokeach, 2006, p 176). The CIT consists of two major components: the neighborhood storytelling network and the communication action context. The neighborhood storytelling network consists of formal and informal communication ranging from conversations between neighbors to advertisement fliers from local non-profit organizations. The communication action contexts are the resources that promote that communication such as libraries, schools, churches, and parks (Figure 2-4).

The structure of the CIT not only physically resembles Bronfenbrenner's (1979) early ecological systems theory representation but also shares many of the factors as well, which is somewhat expected given that the CIT also is an ecological model (Kim and Ball-Rokeach, 2006). The neighborhood storytelling network involves many entities that are considered parts of the microsystem and exosystem in Bronfenbrenner's (2005) context proposition of the PPCT. The communication action context has multiple factors that overlap with the bioecological theory's context proposition as well.

Components of several theories indicate that individuals are, in many ways, "products of their environment" and that environmental factors greatly influence cognitive aptitude and characteristics. The idea that behavior can be learned through modeling and repetition is implicitly present throughout Bronfenbrenner's bioecological theory of human development. Bronfenbrenner (2005) also believed there existed environmental factors that influenced individuals' development in unintended positive and sometimes negative ways. These unintended influences are part of the complexity that renders the study of human behavior so challenging.

Bronfenbrenner's Ecological Framework for Human Development

To more fully understand Bronfenbrenner's bioecological theory of human development, it is helpful to study its evolution. The components of the ecological framework for human development can be traced back to his 1943 doctoral dissertation at the University of Michigan (Bronfenbrenner, 1999). In 1979, he formally introduced this model by publishing, Ecological Framework for Human Development: Experiments by nature and design (Bronfenbrenner, 1979). From that earliest version, Bronfenbrenner continuously developed, refined, and added to his theory of human development until his death in 2005 (Tudge et al., 2009) Bronfenbrenner addressed this himself when he wrote: "I have been pursuing a hidden agenda: that of re-assessing, revising, and extending - as well as regretting and even renouncing - some of the conceptions set forth in my 1979 monograph" (Bronfenbrenner, 1989, p. 187).

This "hidden agenda" is worth mentioning because many authors cite the Ecological Systems Theory (EST) and then pick and choose what they need from more than 30 years of progressive versions, including concepts that no longer are supported by Bronfenbrenner (Tudge et al., 2009). This current research project uses Bronfenbrenner's most recent bioecological theory of human development from his latter work of 1999 to 2005 (Boon et al., 2012; Bronfenbrenner, 2005; Tudge et al., 2009).

Properties of the Bioecological Model

Bronfenbrenner began referring to his work as the "Bioecological" theory of human development ten years after the publication of "Ecological Systems Theory" in 1989 (Bronfenbrenner, 2005). The addition of "bio" to ecological was an acknowledgement that biology, in the form of genetics, impacts an individual's development. This addition is an advancement from the original ecological model that focused solely on external influences on the individual. This change brought with it more focus on the processes of human development and its pivotal concept in the context of this hurricane-preparedness research study (Tudge et al., 2009).

Eventually, in the 1990's, Bronfenbrenner began introducing the Process-Person-Context-Time (PPCT) Model as the foundation of his theory (Tudge et al., 2009). Within this model, "Process" is the interactions between individuals and their environment. Bronfenbrenner began to describe proximal processes as a key factor in human development (Figure 2-5) (Bronfenbrenner, 1999). These proximal processes can be defined as "enduring forms of interaction of increasing complexity within the immediate environment…that occur regularly over an extended period of time" (Bronfenbrenner, 2005, p. 6) Some examples of these processes are playing with children, reading, bedtime routines for children, and personal hygiene habits. In the contexts of hurricane preparedness, this could range from as simple as discussing what the dangers of hurricanes are with children to evacuation drills or practice of installing window protection.

"Person" entails individuals and their biological characteristics (age, gender, motivation, and intelligence) (Bronfenbrenner, 2005). These characteristics were subdivided into three types: demand, resource, and force characteristics (Figure 2-6). Demand characteristics are those attributes readily assessed by others. This includes age, gender, and physical appearance (Tudge et al., 2009). Resource characteristics are not readily apparent to others but can sometimes be induced from the demand characteristics. These include intelligence, past experience, as well as social and material resources (Tudge et al., 2009). The last type of characteristic is force characteristics; these pertain to internal drive, motivation, tenacity, and temperament. These force characteristics can explain much of the variances in development by individuals with similar demand and resource characteristics (Bronfenbrenner, 2005). An example of force characteristics is when an entire neighborhood of homes all have about the same susceptibility to hurricane damage, yet its homeowners vary widely in their inclination to prepare for an approaching storm.

"Context" and "Time" are concepts that were carried forward from the original ecological model of human development. Context can be represented as the four concentric circles of the original ecological model (Figure 2-7). The circles radiate outwards from the individuals located at the center. Those closest to the individuals exert the most influence on their development. Examples of the microsystem are family, peers, school, and church. This basically can be any environment with which individuals spend a fair amount of time participating in activities and interacting (Bronfenbrenner, 2005; Tudge et al., 2009). It follows directly that these groups can vastly influence individuals' development and views regarding hurricane preparation.

The mesosystem represents the interactions of the groups of the microsystem with each other and with the entities of the exosystem. These are interactions that occur between the microsystem group that the individual most associates with and other entities in the microsystem (Tudge et al, 2009). The individual is not directly involved in these interactions, yet the outcomes still affect the individual (Bronfenbrenner, 2005).

In the context of hurricane preparedness, this could be observed in the interaction between a program instructor and the entity that facilitates the program and how this affects the individual. Tudge et al. (2009) used the example of a mother's workplace being an exosystem for her child. The child does not interact with the workplace, but if the mother is in a bad mood because of the workplace, it affects the child when the mother returns home (Tudge et al., 2009).

The exosystem is where the mass media, local politics, and social services interact with the individual indirectly. They influence the microsystem and individual but to a much lesser degree to the individual than that of the microsystem (Bronfenbrenner, 2005). These entities interact directly with the individual's microsystem group. The exosystem refers to the structures in which the entities of the microsystems exist. Local emergency management and state building-code enforcement are examples of entities comprising individuals’ exosystems.

The macrosystem is the outermost ring, and this is where social and societal norms are located (Bronfenbrenner, 2005). They represent some of the weakest influences on the individual, but they are still very present in the individual’s life. All the other systems are influenced by the macrosystem, and all the other systems affect the macrosystem in turn (Tudge et al., 2009). The degree to which society views the efficacy of hurricane preparedness in general can affect individuals from the macrosystem.

Finally, the chronosystem is the effect of time on all influences. An example would be the influence of experiencing tragedy, such as Hurricane Katrina, which is overshadowing of all other factors immediately after occurring, and then its influence diminishes with the passing of time (Bronfenbrenner, 2005). In the later iterations of the PPCT model, the chronosystem is broken down into the subfactors of micro-time, meso-time, and macro-time to correspond with whatever system was directly influenced (Bronfenbrenner and Morris, 1998).

Throughout the review of literature making use of the PPCT model, a graphical representation was unable to be located. Thus, in this current study, a simplified graphical representation has been created and is offered based on the explanations presented in Bronfenbrenner’s latter work from 1998 – 2005. This is not a comprehensive model of the propositions from the bioecological theory; however, it includes many propositions on which Bronfenbrenner placed the most focus (Figure 2-8). Bronfenbrenner listed distinctive defining properties of the Bioecological Model in the form of propositions. Several of those propositions already have been discussed as components of the PPCT model. The remaining four are experience, strong mutual emotional attachment, internalization and third-party role (Bronfenbrenner, 2005). Experience is a critical element of the model because merely being in an environment will not lead to development. The individual must interact with the environment and the persons comprising that environment to experience developmental growth (Bronfenbrenner, 2005).

The next proposition for human development is strong mutual emotional attachment. Development will occur faster and is more likely to be longer lasting if individuals care about the people (e.g., parents, program leaders) with whom they are sharing proximal processes. It is also important that these people reciprocate these feelings towards the individuals as well (Bronfenbrenner, 2005). A good example of this is comparing the development of small children and their differences in progress based on whether they like their teacher or not. Strong mutual emotional attachment leads to the next proposition of internalization. Internalization is when individuals observe the actions of others in their microsystem and are interested and motivated to engage in related activities (Bronfenbrenner, 2005).

The final proposition is the role of third-parties, which essentially is encouragement and reinforcement from others outside of the individual’s closest microsystem individual. Bronfenbrenner (2005) also mentioned that it is helpful, but not essential for this third-party to be of the opposite sex of the individual’s main person of contact. It is suggested that this helps to broaden the experiences and activities of the individual (Bronfenbrenner, 2005).

Applications of the Bioecological Theory of Human Development

As more is learned about Urie Bronfenbrenner, beyond that of his theories and models, especially his role in the development of the federal Head Start program in 1964, it is not surprising that the EST was initially used in the field of early childhood development. The majority of “individuals” were children, and the “microsystems” were mostly parents and teachers in the early days of the EST (Bronfenbrenner Center for Translational Research, 2014).

During the past 36 years since Bronfenbrenner’s, “The Ecology of Human Development: experiments by nature and design,” many childhood development studies have used the EST as a framework as originally intended. Researchers rapidly extended the applicability of the EST from childhood development to also include education studies.

Some contemporary examples of education applications include Maynard, Beaver, Vaughn, DeLisi, and Roberts’ (2014) study that examined school engagement of middle-school and high-school students. The bioecological model was a good fit because of the complexity of influencing factors that affect engagement. Further, the use of the bioecological model allowed their study to include biological (internal) factors in addition to ecological (external) factors that influence school engagement (Maynard, Beaver, Vaughn, DeLisi, and Roberts, 2014).

Another logical area of research that stemmed from child development and education was the study of parents’ influence on their children’s academic development and progress. Harding, Morris, and Hughes (2015) focused on maternal education and the effect that had on children’s academic outcomes. This application of Bioecological Theory focused on the “context” aspect of the PPCT model. It specifically looked at parenting activities as they fit into the microsystem, exosystem, and mesosystem (Harding, Morris, and Hughes, 2015).

Gonzalez and Barnett (2014) further explored familial and parents interactions on children by studying maternal psychological distress among Mexican-origin families. The subset of this population that Gonzalez and Barnett (2014) focused on was families with non-biological father figures and the affect that their support had on the mothers. Gonzalez and Barnett made use of the PPCT model but were unable to truly utilize the "time" aspect due to a cross-sectional research design. "Person" characteristics included whether the family spoke Spanish or English in the home and "context" aspect of the model helped to examine the family structure of each participant family.

As the EST continued to be refined and more widely used within the previously mentioned fields, its visibility among researchers in other fields also continued to grow. This encouraged propagation into additional fields within the context of human development where a multitude of influences all act on individuals, causing different decisions and rates of development to occur.

The sports sciences are one of these fields that have widely used bioecological theory to explore youth sports (Domingues and Goncalves, 2014). The interdisciplinary and integrative focus on youth development has spurred the acceptance as a theoretical framework for youth sports. Bioecological theory also has been used to examine the complex influences on barriers and supports for female coaches. Mahoney, Gucciardi, Mallett, and Ntoumanis (2014) focused on the demand, resource, and force characteristics from the PPCT model to discuss mental toughness among adolescents who were top performers in sports, academia, and music. This focus-group study was conducted by sports psychologists and explored the possibility of shared characteristics that led to mentally tough adolescents. The microsystems of coaches, parents, and peers also have been explored in sports sciences (Domingues and Goncalves, 2014).

Bioecological Theory in Emergency Preparedness

To explore the application of the bioecological theory of human development to disaster (hurricane) preparedness, it is important to assess the "fit" of the theory. One way this can be done is through observing its usage in the works of other researchers who also have been concerned with preparedness. Another method in assessing a theory's fit to an area of interest is to explore research that contains similar factors or processes. Hurricane preparedness is not easily compartmentalized into a few simple environmental factors or interactions. These complex interactions that involve many levels of functioning (e.g., individual to microsystem, microsystem to microsystem) serve as a web within which resilience and development emerge. These thoughts were reflected in by Masten and Obradovic (2008) when they stated, "Resilience, like development, is said to arise from processes of interaction across multiple levels of functioning" (Boon, Cottrell, King, Stevenson, and Millar, 2012, p. 389).

The comparison of the processes that lead to development and resiliency serves as support that similarities exist between the complexities of the interactions that lead to these two concepts. Thus, there exist theories that are appropriate perspectives to observe development as well as resiliency. This study suggests that the bioecological theory of human development is such a theory.

The contextual components of the PPCT discuss how an individual continually interacts with other individuals, organizations, and information (Bronfenbrenner, 2005).

Boon et al. (2012) represented some of these entities that can interact with an individual and influence their feelings and beliefs towards emergency preparedness (Figure 2-9). These interactions and experiences can be directly in contact with the individual, or they can occur as proximal processes, but they all interact with the individual's genetic predispositions (Bronfenbrenner, 2005; Boon et al., 2012).

Another aspect of bioecological theory that directly coincides with contemporary understanding of emergency preparedness is that the beliefs and values of individuals cannot be separated from the environment in which they are located (Bronfenbrenner, 2005; Boon et al., 2012). Thus, even a complete understanding of the individual or the environment will still only represent a partial explanation of the motivations for development.

In tracing the history of the terms "resilience" and "disaster-risk reduction," Alexander (2013) mentions Bronfenbrenner's bioecological theory as "a gift to ecology from developmental psychology" (p. 2712). This is strong praise, but these sentiments have been echoed by others who have studied emergency preparedness (Harney, 2007; Boon et al., 2012; van Kessel, Gibbs, and MacDougall, 2015).

Bronfenbrenner's (2005) thoughts about the future perspectives of bioecological theory generally work well in the context of hurricane preparedness and emergency preparedness with respect to his following three propositions.

The first proposition is that development is influenced by the actions of the child on the parents as the child passes through adolescence and into adulthood (Bronfenbrenner, 2005). As young individuals become increasingly aware of the importance of emergency preparedness and properly preparing for natural disasters, how are those who are encouraging this development affected? Nidus and Sadder (2009) suggested that the most effective teachers learn from their students and improve their delivery of material based on observing student development. Therefore, it follows that individuals who deliver emergency-preparedness programs would become most effective and improve their delivery of material by observing participants' develop the desired outcomes of the training.

The second proposition is that of a role-reversal where children benefit in their youth from their parents' attachment and concern, then in the parents' elderly years, the children's devotion to them becomes beneficial to the parents (Bronfenbrenner, 2005). This child/parent relationship role-reversal can be translated into emergency-preparedness education through the participant/instructor relationship. Those program administrators who act as microsystems that encourage individual participants to learn more about preparedness are committed to these participants early in this process. Over time a percentage of participants will become intensely interested in learning as much as they can about preparedness and could feasibly return to assist or further the knowledge of those program administrators. Thus closing the role-reversal loop proffered by Bronfenbrenner (2005).

The third proposition of future interest mentioned by Bronfenbrenner (2005) is that of replication. If an assessment of outcomes during an extended period of time detects change, it warrants the replication of the process, program, or experiment to verify that the changes in outcomes are truly due to the intervention (Bronfenbrenner, 2005). Despite the importance of this verification step, academia rewards originality, thus replication is quite rare in the social sciences (Bryman, 2012).

The translation of this replication into emergency preparedness would involve assessing participant levels of preparedness before and after any intervention (program, media, etc.) aimed at increasing the level of preparedness. This also would involve assessing participants from more than one application of the intervention.

Strengths of the Bioecological Theory of Human Development

There are several strengths associated with the application of bioecological theory to human development. Arguably what distinguishes Bronfenbrenner's work from many competing theories is the focus on context and proximal processes. This focus allows for the inclusion of individuals' genetic characteristics as well as environmental factors affecting the development of individuals to "tell" a more complete story. Another strength of bioecological theory is its very systematic approach to the examination of the various levels of the individual's environment. This allows the environment to be categorized and organized by direct and indirect contact with the individual as well as the amount of influence that each entity possesses.

The bioecological theory also acknowledges that individuals are active participants in their own development rather than uninvolved participants. This active involvement allows for the fact that individuals influence their environment as it simultaneously affects them.

The final strength of the bioecological theory is that its evolution did not limit its scope to child development. The concepts of context and proximal processes are applicable to many disciplines concerned with the development of individuals, or even organizations and communities.

Weaknesses of the Bioecological Theory of Human Development

The biggest weaknesses of bioecological theory are related to its strengths. Due to its broad applicability, it is difficult to determine exactly how the theory translates into empirical research. Bioecological theory's complexity allows for the inclusion of many facets of interaction between an individual and his or her environment, but this same inclusionary complexity requires a research design as nearly complex to address each aspect. Thus, to account for all of the components of bioecological theory, it is necessary to address the PPCT model, multiple genetic attributes, three aspects of personal characteristics, four levels of environmental factors, three levels of time, while testing all of the entities comprising individuals' environment. This complexity is what has led to many cross-sectional studies of micro- and macrosystems claiming bioecological theory as a theoretical framework (Tudge et al., 2009).

Review of Current Literature

Numerous academic journal articles and studies have addressed various aspects of emergency or disaster preparedness in recent years. Many were in response to pandemics (e.g., influenza, Ebola, and AIDS), man-made or technological disasters (e.g., chemical spills, oil spills, and damaged nuclear facilities), and natural hazards (e.g., tsunamis, earthquakes, tornadoes and hurricanes/typhoons). Given that this current study addresses Southeastern Georgia, Florida, and the Gulf Coast, its focus is on natural hazards with an emphasis on hurricanes.

Savoia, Lin, and Viswanath (2013) undertook a systematic review of articles in five peer-reviewed journals published to the MEDLINE database in 2009. They searched for articles that included aspects of communications in public-health emergency preparedness (Savoia, Lin, and Viswanath, 2013). After three rounds of structured review, the final sample for this review included 131 articles and addressed emergencies ranging from infectious disease outbreaks (55%) to terrorism and bioterrorism (17%) to natural disasters (8%) (Savoia et al., 2013). Of the articles in this review, 52 were population-based, empirical studies (Savoia et al., 2013). A majority of these studies were focused on attitudes, beliefs, socio-demographic factors, and their association with emergency-preparedness outcomes. Although the majority of emergencies addressed were health related, the three most frequently studied preparedness outcomes also are prevalent in the current natural-disaster literature.

Preventive Behaviors

The preparedness outcome that occurred with the highest frequency was preventive behaviors; and it was present in 65 percent of the population-based, empirical studies (Savoia et al., 2013). Preventive behaviors were defined as “any activity undertaken by individuals to prevent a disease or limit contagion to other people” (Savoia et al., 2013, p. 176). By altering a few words, this definition about contagious disease can be applied to disasters and the mitigation of damage incurred by these disasters. This new definition for preventive behaviors would be: Any activity undertaken by individuals to prevent a disaster or mitigate the damage done by a disaster.

Meyer, Baker, Broad, Czajkowski, and Orlove (2014) asked respondents that were in the paths of Hurricanes Isaac and Sandy about any protective actions they had taken. The Hurricane Isaac study collected data from southeast Louisiana to the two westernmost counties in Florida’s panhandle, and the Hurricane Sandy study collected data from Virginia to northeastern New Jersey (Meyer, Baker, Broad, Czajkowski, and Orlove, 2014). They found that even though the vast majority (94%) of their sample made preparatory actions and believed they were adequately prepared to endure the storms, further questioning revealed that only 55 percent of the sample that owned window protection had installed it at the six-hour mark before the storms made landfall. In addition, only 25 percent of those sampled had plans to evacuate if ordered to do so (Meyer et al., 2014). This led researchers to determine that residents were not as prepared as perceived.

Risk Perception

Risk perception was found in 54 percent of the population-based, empirical studies and can be defined as a personal judgment about the severity of a risk and its effects on the society or individual (Savoia et al., 2013).

Peacock, Brody, and Highfield (2005) found that Floridian homeowners' hurricane risk perceptions were associated with the physical location of their homes in respect to wind vulnerability zones. These zones were established based on ASCE 7-98 wind contours, which were established by the American Society of Civil Engineers Standards 50-100 year peak gusts (Peacock, Brody, and Highfield, 2005). Peacock et al. (2005) found that homeowners that lived in the highest wind contours perceived the greatest hurricane risk. This finding is positive because it indicated that Florida homeowners' hurricane risk perceptions were consistent with those of experts.

Peacock et al. (2005) also found inconsistencies between the implementation of state-mandated building codes and risk perceptions. There exists a “Panhandle protection provision” that exempts large areas of Florida's panhandle from the rest of the state's more stringent standards and instead opts to enforce the state code only on buildings within a mile of the coast (Peacock et al., 2005). This exception was heavily lobbied for by the homebuilders in the area in 2000 when it was approved by state lawmakers (Dunkleberger, 2005). In 2005, following a busy hurricane season, the exception was unsuccessfully challenged by insurance lobbyists and the Florida Building Commission. The premise for its existence is that the ASCE 7-98 wind contours are incorrect for homes in the panhandle area because they are protected by trees that serve as a windbreak.

This is disconcerting for a few different reasons. First, the panhandle is within the same wind vulnerability zone as southwest Florida’s coast; the risk of wind damage is not lessened in the panhandle, which does not lend support to this provision. Second, homeowners in the panhandle may be unaware that their homes are not as resilient to high winds as homes built throughout the rest of the state. This would provide these homeowners a false sense of security regarding the durability of their home while decreasing their perceived hurricane risk, thus increasing the gap between their perceived risk and their actual hurricane risk severity.

Incongruences also were found by Meyer, Baker, Broad, Czajkowski, and Orlove (2014) as they also explored hurricane risk perceptions. They collected data via telephone interviews from individuals that were preparing for Hurricane Isaac and Hurricane Sandy in 2012. The perceptions of the respondents were found to be inconsistent with the actual severity of the wind, storm surge and flooding that would accompany the two storms (Meyer, Baker, Broad, Czajkowski, and Orlove, 2014). There was a tendency for an overestimation of the intensity of the winds and a significant underestimation of the impact of the storm surge and flooding (Peacock et al., 2005; Meyer et al., 2014).

Trumbo, Meyer, Marlatt, Peek, and Morrissey (2014) studied changes in risk perception and optimistic bias in Gulf-Coast residents during the quiescent two-years subsequent to the destructive 2004 and 2005 Atlantic hurricane seasons. They found the change in risk perception was significant towards a more optimistic outlook. This more optimistic outlook, which was clearly reflected in the resident responses indicating a significantly lower probability of a forced evacuation in the coming year (Trumbo, Meyer, Marlatt, Peek and Morrissey, 2014).

Trumbo et al. (2014) found that age and past hurricane experience were consistent predictors of risk perception; with older, more experienced respondents indicating lower perceived risk. Another finding of this study suggested that risk perception diminished over time and absence of immediate threat (Trumbo et al., 2014). This study also found the change in risk perception increased with lower incomes. Thus, participants with the lowest incomes experienced the largest decrease in risk perception from 2006 to 2008 while those with the highest incomes experienced a much smaller difference (Trumbo et al., 2014).

Knowledge/Awareness

Savoia et al. (2013) found the third most frequently occurring preparedness outcome to be knowledge/awareness. This outcome was represented in 48 percent of the population-based, empirical studies and can be defined as knowledge of specific threats and the behaviors that are adopted to prevent them (Savoia et al., 2013).

Lindell, Tierney, and Perry (2001) found several predictors of preparedness that are directly related to knowledge and awareness. These predictors included: attentiveness to the media, higher levels of education, personal knowledge of the respective hazard, and high levels of social involvement (Lindell, Tierney, and Perry, 2001). Social involvement is related to knowledge and awareness because those who interact in virtual and face-to-face social networks have the ability to access knowledge indirectly through other members of their network. Older residents with higher incomes and higher levels of education also were found to possess an increased perception of hazard knowledge (Ge, Peacock, and Lindell, 2011).

Other Factors of Preparedness

Education was found to influence hurricane preparedness in Florida by Baker’s 2006 study (Baker, 2011). He found that college graduates reported the highest levels of preparedness and those without a high school diploma or GED scored the lowest. Baker (2011) also found that higher incomes, those between the ages of 40 and 70 years, and locations nearest the coast all were related to higher levels of preparedness. Residents of the northwest coastal region (Panhandle) had the highest levels of preparedness, and residents in the inland counties reported the lowest levels of preparedness (Baker, 2011).

Other researchers examined hurricane-hazard mitigation incentives. One such study split incentives into economic and non-economic programs as the researchers explored the effectiveness of each program on the installation of hurricane shutters (Ge et al., 2011). These programs ranged from loans, insurance discounts, and property-tax reductions to hurricane preparedness inspections.

Access to evacuation orders or other hurricane information has also been studied by previous research. Taylor-Clark, Viswanath, and Blendon (2010) found that individuals who were unemployed as well as those with limited or nonexistent social networks were the least likely to receive evacuation orders. This same study found homeowners and those more than 55 years of age tended to underestimate the severity of hurricanes whereas females who rented their homes were the most likely to comply with evacuation orders they were aware of (Taylor-Clark et al., 2010).

Although homeowners' trust in government and non-profit entities is not a direct measure of the homeowners' perception or intention to prepare for hurricanes, this trust affects their sense of security and their perception of the availability of assistance when needed. Reinhardt (2015) stated that findings in trust at all levels of government were lower following Hurricane Katrina and the 2010 BP oil spill. This is indicative of the public's disapproval of the handling of these events by emergency management. Reinhardt's (2015) study suggested that the media asserts a large impact in the level of trust of federal, state, and local governments. Individuals who have positive experiences are less swayed by negative media exposure than those unaffected by the hazard (Reinhardt, 2015).

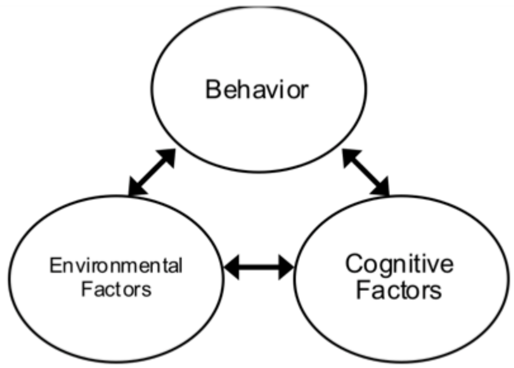

Figure 2-1. Social Cognitive Theory (Bandura, 1986)

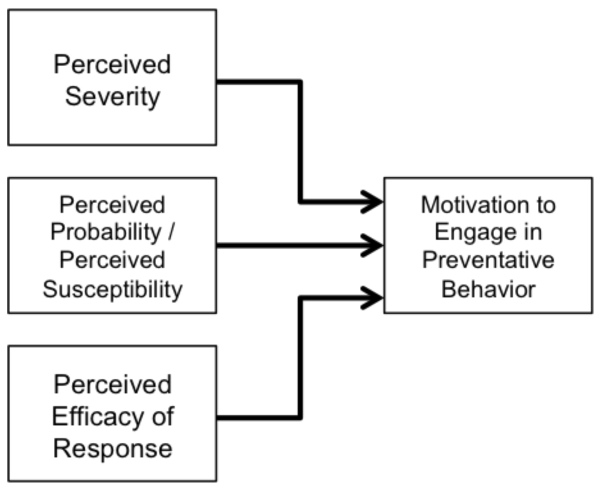

Figure 2-2. Protection Motivation Theory (Rogers, 1975)

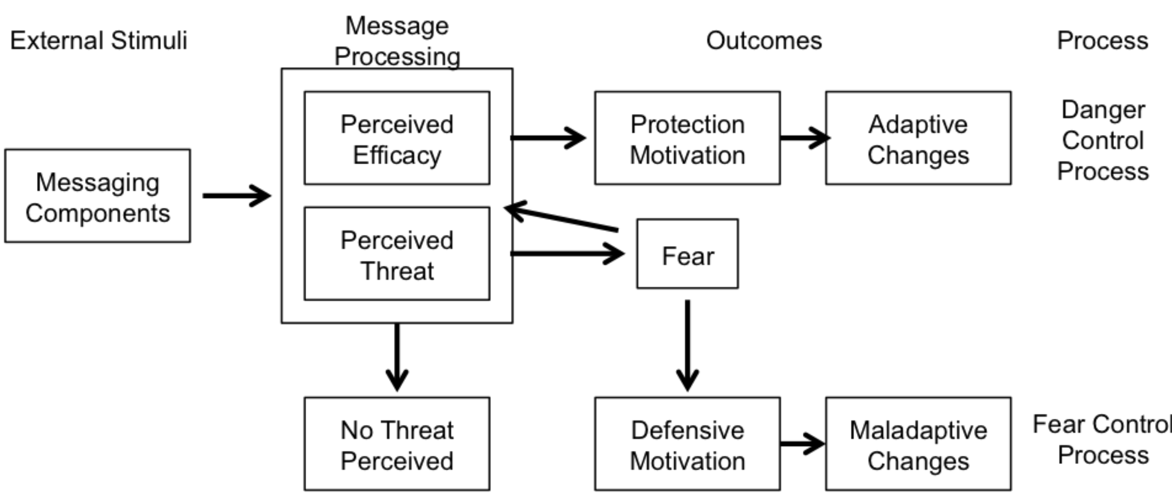

Figure 2-3. Extended Parallel Process Model (Witte, 1992)

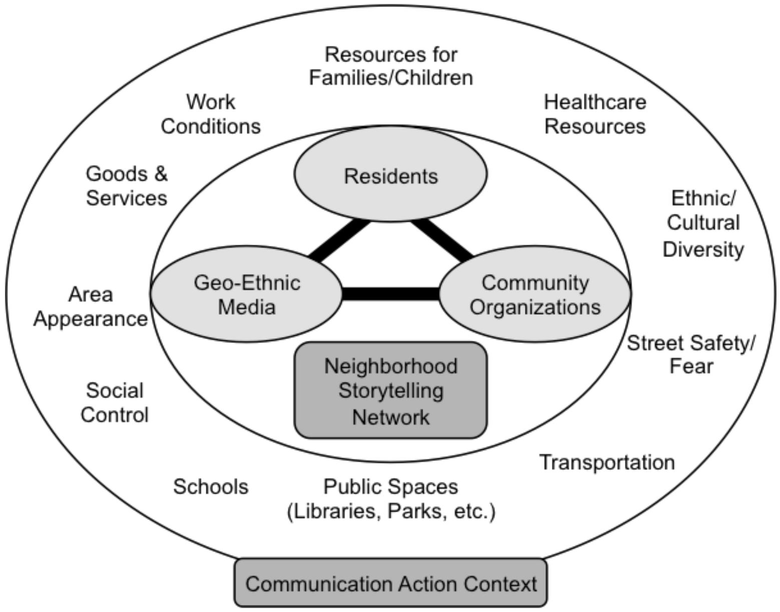

Figure 2-4. Communication Infrastructure Theory (Kim and Ball-Rokeach, 2006)

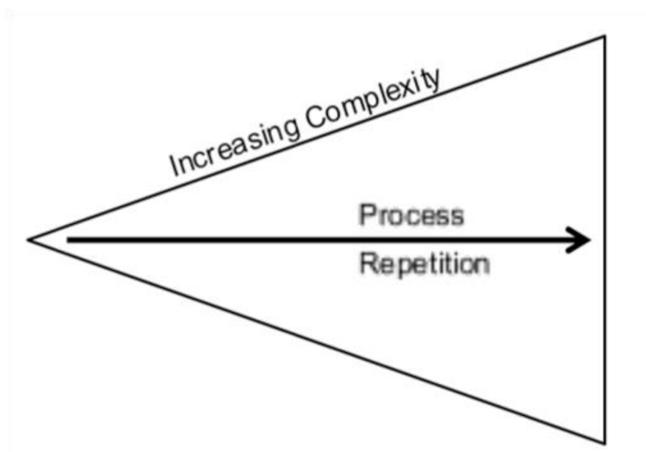

Figure 2-5. Proximal Processes adapted from Bronfenbrenner, 2005

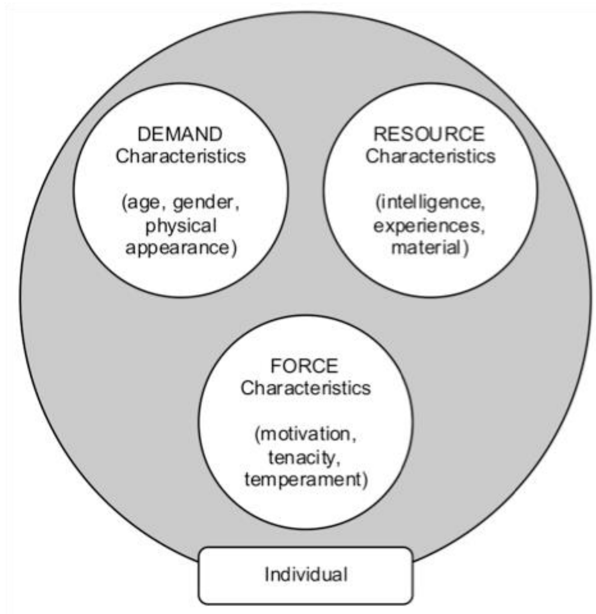

Figure 2-6. Person Characteristics adapted from Bronfenbrenner, 2005

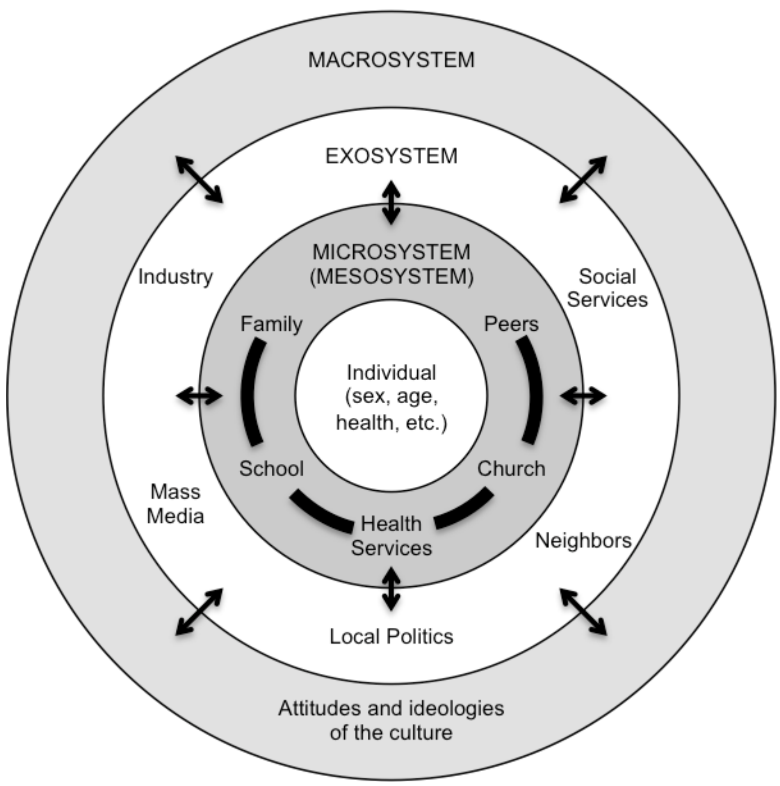

Figure 2-7. Ecological Systems Theory Model (Bronfenbrenner, 2005)

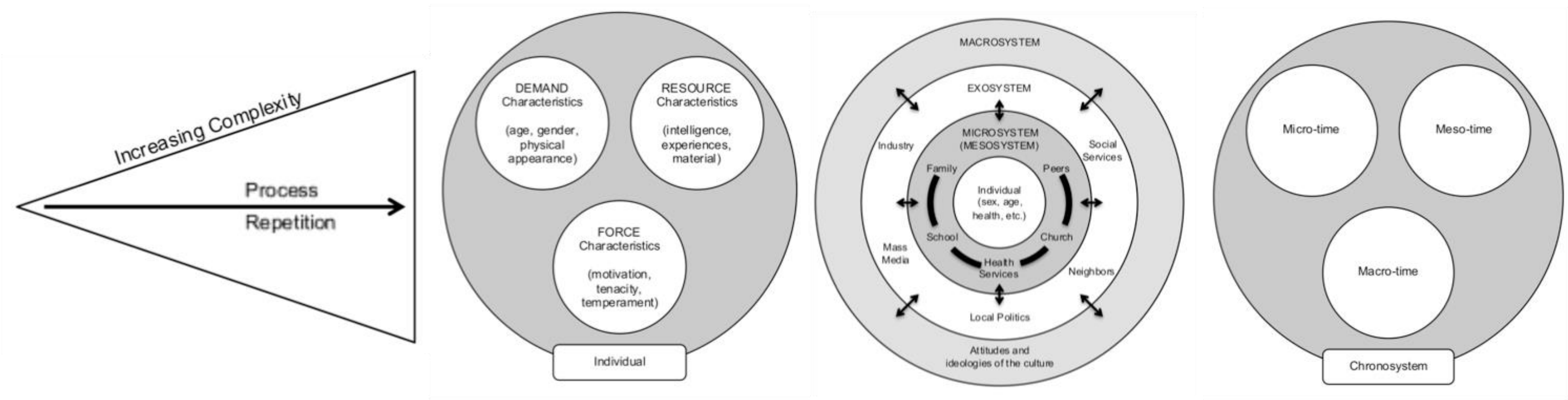

Figure 2-8. Process-Person-Context-Time Model adapted from Bronfenbrenner, 2005

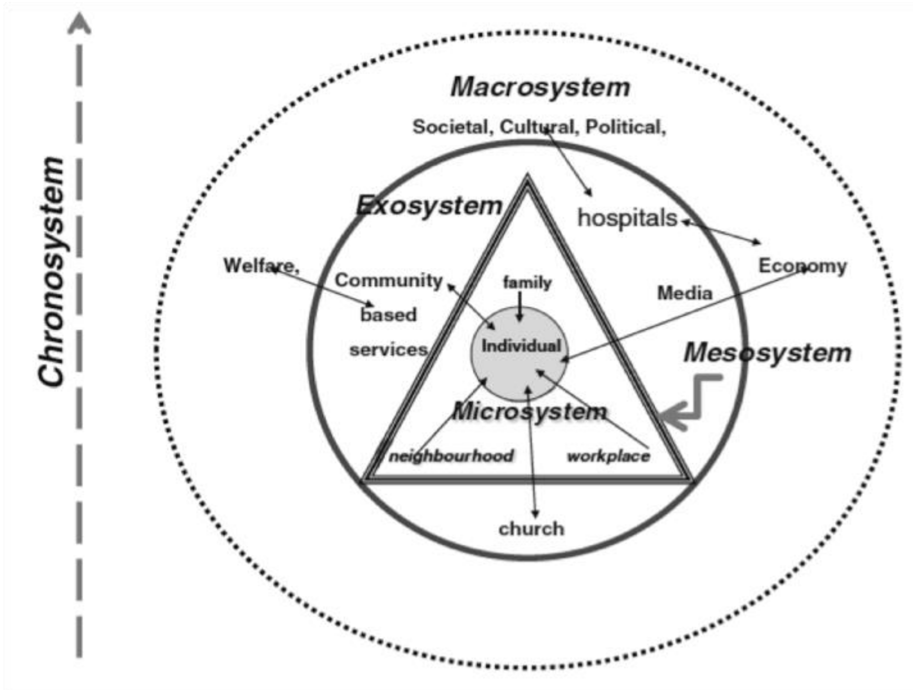

Figure 2-9. Boon's adaptation of Bronfenbrenner's Ecological Systems Model (Boon et al., 2012)

CHAPTER 3
METHODOLOGY

Research Questions and Hypotheses

This study is guided by two main research questions. The first involves specific demographic characteristics' (*location, education, income*, and *age*) association with hurricane-preparedness knowledge, and the second involves the associations between the same demographic characteristics and homeowners' trust in their local community's, non-profit organizations', and government's ability to assist during a crisis. Each of these research questions has four sub-questions (representing the four demographic characteristics), and each of those has two hypotheses that focus on Florida specifically and then the entire study area.

RQ1:
To what extent can demographic characteristics (*location, education, income*, and *age*) predict homeowners' self-reported score on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)*?

> $RQ1_A$:
> To what extent can the *location* of homeowners affect their self-reported score on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)*?
>
> > $H1_{A1}$:
> > Homeowners located in the counties of Florida's *Panhandle* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other regions within the state.
> >
> > $H1_{A2}$:
> > Homeowners located in *Georgia* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other *States* within the study area.
>
> $RQ1_B$:
> To what extent can homeowners' *Education Level* affect their self-reported score on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)*?

$H1_{B1}$:
Florida homeowners attaining *less than a bachelor's degree* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners within the state.

$H1_{B2}$:
Homeowners from across the study area attaining *less than a bachelor's degree* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners.

$RQ1_{C}$:
To what extent can *household income* level affect homeowners' self-reported score on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)*?

$H1_{C1}$:
Florida homeowners with *lower levels of household income* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners within the state.

$H1_{C2}$:
Homeowners from across the study area with *lower levels of household income* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners.

$RQ1_{D}$:
To what extent can homeowners' *age* affect their self-reported score on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)*?

$H1_{D1}$:
Florida homeowners who are *younger* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners within the state.

$H1_{D2}$:
Homeowners from across the study area who are *younger* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners.

RQ2:
To what extent can demographic characteristics (*location, education, income*, and *age*) affect homeowners' self-reported score on this study's *Trust in Support Entities Scale (TSES)*?

$RQ2_{A}$:
To what extent can the *location* of homeowners affect their self-reported score on this study's *Trust in Support Entities Scale (TSES)*?

$H2_{A1}$:
Homeowners located in the counties of *Florida's Panhandle* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other regions within the state.

$H2_{A2}$:
Homeowners located in *Louisiana* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other states within the study area.

$RQ2_{B}$:
To what extent can homeowners' level of *educational attainment* affect their self-reported score on this study's *Trust in Support Entities Scale (TSES)*?

$H2_{B1}$:
Florida homeowners holding *less than a bachelor's degree* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other homeowners within the state.

$H2_{B2}$:
Homeowners from across the study area holding *less than a bachelor's degree* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)*.

$RQ2_{C}$:
To what extent can *Household Income* affect homeowners' self-reported score on this study's *Trust in Support Entities Scale (TSES)*?

$H2_{C1}$:
Florida homeowners with *lower levels of household income* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other homeowners within the state.

$H2_{C2}$:
Homeowners from across the study area with *lower levels of household income* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other homeowners.

$RQ2_{D}$:
To what extent can homeowners' *Age* affect their self-reported score on this study's *Trust in Support Entities Scale (TSES)*?

$H2_{D1}$:
Florida homeowners who are *younger* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other homeowners within the state.

$H2_{D2}$:
Homeowners from across the study area who are *younger* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other homeowners.

Research Design

As previously mentioned, the purpose of this study is to examine the associations that specific demographic characteristics (*location, education, income*, and *age*) have with hurricane preparedness in Southeastern Georgia, Florida, and the Gulf Coast. Given this intention, along with controlling costs of data collection, a cross-sectional research design seemed warranted (Gorard, 2013). A cross-sectional research design is defined as "the collection of data on more than one case and at a single point in time in order to collect a body of quantitative or quantifiable data in connection with two or more variables, which are then examined to detect patterns of association" (Bryman, 2012, p. 58).

Bryman's (2012) definition is useful because it emphasizes four key elements of cross-sectional research design that some definitions lack. The first two elements, "more than one case" and "at a single point in time" are very common in others' definitions. Collecting data from multiple cases allows for exploration in variation between the cases - whether grouped by demographic variables, geographical location, or any number of ways the cases can be categorized. Collecting data at a single point in time does not necessarily mean all the data is collected simultaneously, although it could be, but rather it means that data is collected only once from each case. The data collection of this research design usually occurs during a relatively short period of time, especially when compared to the typical time required for data-collection periods in other types of research designs, which may take months or even multiple years (Bryman, 2012).

The third element, “collection of a body of quantitative or quantifiable data” is often implied in other definitions, whereas it is explicit in the definition chosen by Bryman (2012). This element is extremely important because it specifies that the data must lend itself to a “systematic and standardized method for gauging variation” (Bryman, 2012, p. 59). The final element in this definition, “patterns of association,” also is implied but lacking in other definitions. This is important because it not only describes what can be gleaned from cross-sectional data but what cannot be determined as well. Due to the lack of time-ordering of variables, determinations cannot be made regarding the directionality of causal influence. Thus, associations between multiple variables may be found, yet with a true cross-sectional design, cause-and-effect relationships cannot be determined (Bryman, 2012).

Cross-sectional research design is often referred to as “survey design.” Although many of the studies utilizing this design are in fact surveys, there are additional forms of data collection that fit into cross-sectional research design. This research design can also include structured observations, diaries, content analysis, and official statistics (Bryman, 2012).

Population/Sampling

Due to this study’s focus on disaster preparedness, specifically hurricane preparedness, a population that was in an area prone to hurricanes was desirable. In the US that area contains the Atlantic coast, Florida, and the Gulf Coast (Landsea, 2015). In an effort to make the population of interest more homogenous and to focus on those with the most personal value to lose by not preparing for hurricanes, the decision to focus on homeowners was made.

The population of interest for the data set was homeowners, aged 25 to 75, living in 106 counties comprising Southeast Georgia, Florida, and the coastal counties of Texas, Louisiana, Mississippi, and Alabama. Due to limitations in participant availability, 64 counties were added to the study area in order to collect the desired sample quantities. Survey Sampling International (SSI) was contracted to collect the sample from its existing membership panels located in the counties of interest. The 2,769 collected responses were “cleaned” to 1,943 usable responses based on the explanations in Table 3-1 (Descriptive statistics of the Clean Responses are available in Appendix A).

Instrumentation

This study used a dataset from a multi-item instrument that was developed by Dr. Randall A. Cantrell and C. Bradford Sewell of the University of Florida, during the spring semester of 2014. It was the third and final instrument used as part of the overall Decision-Ade™ (Cantrell and Sewell, 2015) research project data-collection process. In the interest of furthering the Decision-Ade™ tool’s ability to segment homeowners aged 25 to 75 years, this online-delivered instrument explored the themes of energy conservation, community resilience, disaster preparedness, and attitudes regarding relationships. The multi-item measures consisted of six Decision-Ade™ items, 24 energy-conservation items, 50 resilience and preparedness items, 20 items related to attitudes regarding relationships, and 10 socio-demographic items for a total of 110 mostly Likert-style response items. The instrument was pretested during the summer of

2014, which was when the finalized data collection occurred as well. The trimmed mean-completion time was 18 minutes.

Data Analysis

Principal Components Analysis

This study used Principal Components Analysis (PCA) as a dimension reduction technique to produce scales that were appropriate continuous variables to serve as dependent variables (DV) for analyses of differences between groups. The PCA was performed on a section of 53 items from the survey instrument that focused on disaster preparedness and community resiliency. These items were subjected to PCA performed in IBM’s Statistical Package for Social Sciences (SPSS) software, version 22.

Prior to performing the PCA, the suitability of data for factor analysis was assessed. This included an inspection of the correlation matrix, with attention given to any coefficients of .3 and greater. The Kaiser-Meyer-Olkin measure of sampling adequacy was used to determine if there were linear relationships between the items and thus whether it would be appropriate to continue with the PCA. Once the KMO was performed, the KMO value was confirmed to exceed the recommended value of .6 (Kaiser, 1970, 1974). The Bartlett’s Test of Sphericity (Bartlett, 1954) was verified to be significant. Bartlett’s test was used to confirm that the correlation matrix was indeed an identity matrix. This is essential to the PCA because if it were not an identity matrix this would have meant that there were no correlations between any of the items.

Once the PCA was performed, in accordance to the eigenvalue-one criterion, components with eigenvalues greater than 1.0 were of interest (Kaiser, 1960). This 1.0 threshold is of value because any eigenvalues less than 1.0 would indicate that a component explained less variance than an item would alone. The next steps focused on increasing the total variance explained through simplifying the PCA and essentially removing items that may be introducing “noise” or interference to the components. By increasing the total variance explained while decreasing the number of components, the result is a more efficient set of components. Once the revised PCA was settled on, a split-sample validation was performed to determine generalizability of the PCA components beyond the sample.

Exploring Differences Between Groups

The two research questions relied on separate DVs. The first research question’s DV had eight separate difference between groups analyses performed; one analysis for Florida and one for the study area for each of the four demographic characteristics (*location, education, income*, and *age*). This process was repeated for the second research question’s DV, for a total of 16 differences between groups analyses.

The same protocol was followed for each analysis. After the initial descriptive statistics were calculated for the IV of interest (*location, education, income*, and *age*), the basic requirements for a one-way ANOVA were explored. There were six assumptions that were considered in determining if a one-way ANOVA was appropriate or if another method would have been more appropriate. The first three of these assumptions relate to the study design and the type of data that was collected. These three assumptions were; a) the DV is continuous data, b) the IV is categorical with two or more independent groups, and c) the observations are independent. The first assumption was met for all analyses because the two DVs used were continuous data that used scales that were created through the PCA process. The second assumption held true for all the analyses because the IVs (*location, education, income*, and *age*) had between five and eight categories that were independent of the other categories.

The last of these assumptions was met by simply using a design that used a survey instrument to collect data from different homeowners.

The remaining three assumptions required the output of statistical tests from IBM'S SPSS, version 22, to evaluate. These assumptions are as follows: a) there should be no significant outliers in the IVs, b) the DV should be approximately normally distributed within the IV categories, and c) homogeneity of variance should exist in the DV between the IV categories. There has been some discussion in statistics about what constitutes an outlier, and for this study an outlier will be based on the outlier labeling rule of Hoaglin and Iglewicz (1987). Tukey (1977) originally thought that an outlier could be defined as any point more than 1.5 times the value of the interquartile range (IQR) below or above the IQR. This multiplier is known as *g* in the literature reviewed for this study. Tukey refuted this in later work with Hoaglin and Iglewicz; suggesting that a *g* value of 2.2 was a better multiplier than the original value of 1.5 (Hoaglin, Iglewicz, and Tukey, 1987). Boxplots generated by SPSS were used to identify outliers in the IVs, yet these boxplots used $g = 1.5$ as the multiplier, thus providing a more conservative window of accepted values. Any outliers outside of the range created by the $g = 2.2$ multiplier will be reported in the text. The normality of the DV was confirmed through normal Q-Q plots, histograms, and stem and leaf plots. Finally the homogeneity of the variances were evaluated through the Levene's test for equality of variances.

If the assumptions were verified, the ANOVA was then performed. If the ANOVA indicated that significant differences were present, the Tukey's post hoc analysis was consulted to indicate between which levels of the IVs these differences occurred.

If the assumptions were violated, then alternative non-parametric analysis methods, such as the Welch test, were used to indicate if significant differences were present. If these non-parametric tests indicated significance then the Games-Howell post hoc was used to identify where the differences occurred.

Multiple Regression Modeling

Multiple linear regression analysis was then conducted to analyze the socio-demographic variables predicting scores on the *Hurricane-Preparedness Knowledge Scale (HPKS)* and scores on the *Trust of Support Entities Scale (TSES)*. As with the ANOVA process, there were assumptions to be addressed. Multiple regression modeling requires six assumptions to be assessed to be valid. The first of these assumptions is that of an independence of errors/residuals. Although the study's design made it very unlikely that homeowner responses would be related, the Durbin-Watson test was still used to verify this assumption. A Durbin-Watson statistic value of approximately 2 is the accepted value of this test.

The second assumption is that the IVs (*location, education, income*, and *age*) are linearly related to the DV (*HPKS* or *TSES*). This was assessed by observing a scatter plot of the studentized residual by the unstandardized predicted value, then looking for a linear pattern of distribution of points. The same scatter plot was used to check the third assumption of homoscedasticity. If the data points are evenly distributed across the predicted values this represents homoscedasticity.

The fourth assumption is that no multicollinearity exists in the data. This was verified through examining the correlation table of the DV and IVs for any correlations above 0.7. After this, the collinearity statistics were consulted to verify that none of the tolerance numbers for the IVs are less than 0.1. The fifth assumption is that of no existence of significant outliers or points of influence. The casewise diagnostics table produced by SPSS provided standard residual values; this output was analyzed for any values greater than ±3 standard deviations.

The last assumption to be verified was that the residuals (errors) were normally distributed. The first step was to assess the leverage values created by SPSS for each response. Once these values were sorted, any values above 0.2 were considered risky, with values over 0.5 being considered dangerous. After verifying the residuals, the next step of verifying residual normality was checking for “influential points” by examining the Cook’s Distance values assigned to each response. Cook’s Distance values of greater than 1.0 warranted further investigation. The final step of this assumption was to verify that the distribution through a histogram with a normal curve and a P-P plot.

Once all of these assumptions were verified, the actual multiple regression analysis reporting occurred. This process included model fit (R^2), the model significance (*p* value), the individual IV significance, and the summary of multiple regression analysis tables.

Limitations

As with all studies, this one has its limitations. One of the most difficult barriers to overcome was the physical distribution and availability of participants. Due to the method in which SSI recruits participants for its membership panels, the panels follow trends in population. A higher population density yields a larger pool of possible participants in that area. This works well if a study is focused only in populous areas. However, for this study, it was difficult to get a large enough sample to legitimately perform certain types of statistical tests. In future analysis, alternative data-collection methods should be explored to collect data in sparsely populated areas. Another possible limitation of this sample is gender bias; it has 60 percent female participation. This can be dealt with by weighting the responses during the preparation of the data. This sample was not representative of the population in the study area, so this might marginally impact the generalizability.

A limitation of the instrument used is that it comprised a wide variety of topics, thus risking possible consternation for participants. The instrument also was comprehensive, consisting of 110 items, and this may have caused some degree of response fatigue in participants towards the end of the survey. Another limitation of the instrument was the lack of ethnicity or race items that could be useful in comparing findings with previous studies. The lack of “check questions” in the survey instrument could also be seen as a limitation. If there were items that verified that the homeowners were reading the questions and were not merely responding randomly this would possibly help answer some questions about the reasoning for the existence of some outlying responses.

The cross-sectional research design was used due to advantages in cost and appropriateness of analysis, but this design limits the testing of the time aspect of the PPCT model. Without this aspect, it is impossible to measure development and therefore progress towards increased preparedness.

Table 3-1. Data cleaning process

Responses	Explanations
2,769	Total raw responses
29	Screened out by age (under 25 or over 75)
550	Screened out by homeowner status (non-homeowners)
11	Dropped due to duplicates (single participant submitted two responses)
236	Dropped for incompletes
1,943	Clean responses

CHAPTER 4
RESULTS AND ANALYSIS OF DATA

Overview

This chapter will serve the purpose of presenting the results of the various analyses laid forth in Chapter 3 Methodology. To review, this research study's focus was twofold, 1) to explore associations between specific demographic characteristics of homeowners (location, education, income, and age) and their level of hurricane-preparedness knowledge; and 2) to explore associations between these specific homeowner demographic characteristics and their level of trust in specific support entities (other community members, local emergency management, non-profit organizations, and Federal agencies such as FEMA).

Principal Components Analysis

Of the 53 items from the disaster preparedness and community resilience section of the 1,943 homeowner data set, 45 items were suitable to be used for dimension reduction. These items were subjected to principal components analysis (PCA) performed in IBM's Statistical Package for Social Sciences (SPSS) software version 22. Prior to performing the PCA, the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed that all items had at least one correlation coefficient of .3 or greater. The Kaiser-Meyer-Olkin value was .918, which clearly exceeded the minimum recommended value of .6 (Kaiser, 1970, 1974). In fact, a KMO greater than 0.9 is described as "marvelous" on Kaiser's (1974) classification of measure values. The Bartlett's Test of Sphericity (Bartlett, 1954) was significant at the $p<.001$ significance level, supporting the factorability of the correlation matrix.

This initial PCA revealed the presence of eight factors with eigenvalues exceeding 1.0, explaining 56.08% of the variance collectively (Table 4-1). An inspection of the rotated component matrix revealed several variables with factor loadings less than .500, these variables were removed and the revised PCA was performed again.

The 29 remaining variables from the community resilience and disaster preparedness section of the data set were again subjected to PCA. Prior to performing the PCA, the suitability of data for factor analysis was again assessed. Inspection of the correlation matrix revealed many coefficients of .3 and greater. The Kaiser-Meyer-Olkin value was .878, still exceeding the recommended value of .6 (Kaiser, 1970, 1974) and the Bartlett's Test of Sphericity (Bartlett, 1954) remained significant at the $p<.001$ significance level, supporting the factorability of the correlation matrix.

This revised PCA revealed the presence of six components explaining between 4.91% to 21.98% of the variance of this component individually and 61.62% of the variance collectively (Table 4-2). This parsimonious outcome is much preferred over the initial PCA in which more components explained less variance. The variables that make up each of the components, factor loadings, inter-item correlation matrix, and reliability measures are fully described in Appendix B.

In the interest of testing the generalizability of the findings of this study, a split-sample validation was performed. The split-sample validation method was used as a cost effective alternative to collecting another sample from the population of interest. The sample was randomly split into two halves and the PCA was performed on the halves to confirm the communalities and that the variables split into the same components with roughly the same factor loadings. Table 4-3 compared the two halves with the revised PCA.

This research project had an interest in furthering the understanding of homeowners' perceptions and motivations about preparedness; therefore, the first component, that will be referred to as the "Hurricane-Preparedness Knowledge Scale" (HPKS) component, was of interest. Another interest of this research was in presenting findings to policy makers that would assist in determining if demographic factors affected homeowners' trust in support entities during a time of crisis. This resulted in focus on the third component, which will be referred to as the "Trust in Support Entities Scale" (TSES), to also be included in this study. The factor loadings of the two components used are listed in Table 4-4 and descriptive statistics of the two components of interest are in Table 4-5 (see full details of the PCA process in Appendix B).

Exploring Differences Between Groups

Research Question 1: Hurricane-Preparedness Knowledge

This study's first research question sought to quantify to what extent demographic characteristics (*location, education, income*, and *age*) could predict homeowners' self-reported score on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)*. The effect of each of these demographic characteristics will first be explored within the state of Florida, then once again across the study area.

Location of home

$H1_{A1}$: Homeowners located in the counties of Florida's *Panhandle* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other regions within the state.

The descriptive statistics of the *Hurricane-Preparedness Knowledge Scale (HPKS)* by *Regions in Florida* are shown in Table 4-6. For the test of this hypothesis, the dependent variable (DV) is the *HPKS* score and the independent variable (IV) is the *location* represented by the regions of Florida. Homeowner responses were classified into six groups: *North Florida* (*n* = 163), *West Coast* (*n* = 412), *Panhandle* (*n* = 46), *East Coast* (*n* = 350), *South Florida* (*n* = 305), and *Northwest* (*n* = 56). The *HPKS* scores increased from *North Florida* (*M* = 38.96, *SD* = 8.71), to the *West Coast* of Florida (*M* = 39.22, *SD* = 8.94), to the *Panhandle* of Florida (*M* = 40.48, *SD* = 7.50), to the *East Coast* of Florida (*M* = 41.47, *SD* = 8.80), to *South Florida* (*M* = 42.71, *SD* = 8.47), to *Northwest Florida* (*M* = 44.25, *SD* = 8.07) in that order (Table 4-6).

For the one-way ANOVA, some assumptions must first be verified. As mentioned in the Data Analysis section of the Methodology chapter, the three assumptions based on instrument design held true for all of the analyses. The last three assumptions are confirmed through statistical tests. This study used IBM's Statistical Package for Social Science (SPSS) Statistics, version 22 to perform these tests. The first of these remaining assumptions was d) no significant outliers in the IV groups in terms of the DV. Of the 1,332 homeowner responses from Florida, only one outlier was identified by the boxplot created by SPSS and the outlier labeling rule. (Figure 4-1)

The next assumption is that e) the DV should be approximately normally distributed in each of the IV groups, however the one-way ANOVA is considered robust to violations of normality. This is why an "approximately" normal distribution is assumed. This was confirmed through normal Q-Q plots, stem & leaf plots, and histograms of each region. Finally, the last assumption was that of f) homogenous variances between groups. In this case, there was homogeneity of variances, as assessed by Levene's test for equality of variances (p = .719).

The *HPKS* score was significantly different for the *Regions of Florida*, $F(5,1326) = 9.34$, $p < .001$. Tukey's post hoc analysis (Table 4-7) revealed that the mean *HPKS* scores in *Northwest Florida* (M = 44.25, SD = 8.06) was significantly higher than North *Florida* (M = 38.96, SD = 8.71) and the *West Coast* of Florida (M = 39.22, SD = 8.94). The Tukey's post hoc also revealed that *North Florida* (M = 38.96, SD = 8.71) and the *West Coast* of Florida (M = 39.22, SD = 8.94) *HPKS* scores were significantly lower than the *East Coast* (M = 41.47, SD = 8.80) and *South Florida* (M = 42.71, SD = 8.47) scores. The *HPKS* scores from the *Panhandle* of Florida were not significantly different than any other *regions of Florida*.

$H1_{A2}$: Homeowners located in the state of *Georgia* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other states within the study area.

The descriptive statistics of the *Hurricane-Preparedness Knowledge Scale (HPKS)* by *States* are shown in Table 4-8. For the test of this hypothesis, the dependent variable (DV) is the *HPKS* score and the independent variable (IV) is the *location* represented by the *States*. Homeowner responses were classified into five groups: Southeastern *Georgia* (n = 106), *Florida* (n = 1,332), and the gulf coast counties of *Texas* (n = 329), the combined area of *Alabama & Mississippi* (n = 55) and *Louisiana* (n = 121). The *HPKS* scores increased from *Georgia* (M = 37.32, SD = 9.44), to *Florida* (M = 40.83, SD = 8.82), to *Texas* (M = 41.13, SD = 8.74), to the combined area of *Alabama & Mississippi* (M = 42.07, SD = 8.87), to *Louisiana* (M = 42.69, SD = 8.14), in that order (Table 4-8).

A one-way ANOVA was conducted to determine if the *HPKS* score was different for homeowners in different *States*. As mentioned in the Data Analysis section of the Methodology chapter, the three assumptions based on instrument design held true for all of the analyses. As the remaining three assumptions were addressed, there was only one outlier observed out of the sample of 1,943, as assessed by percentile output and the outlier labeling rule. The DV data was normally distributed within each group and was explored by normal Q-Q plots, histograms, and stem & leaf plots. There was homogeneity of variances, as assessed by Levene's test for equality of variances (p = .785).

The mean *HPKS* scores were significantly different between the States, $F(4, 1938) = 5.93$, $p < .001$. Tukey's post hoc analysis (Table 4-9) revealed that the mean *HPKS* score in *Georgia* (M = 37.32, SD = 9.44) was significantly lower than all other states, *Florida* (M = 40.83, SD = 8.82), *Texas* (M = 41.13, SD = 41.13), *Alabama & Mississippi* (M = 42.07, SD = 8.87), and *Louisiana* (M = 42.69, SD = 8.14). The *HPKS* scores from the other *States* were not significantly different.

Highest education level of homeowner

$H1_{B1}$: Florida homeowners attaining *less than a bachelor's degree* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners within the state.

The descriptive statistics of the *Hurricane-Preparedness Knowledge Scale (HPKS)* by homeowners' *educational levels* in Florida are shown in Table 4-10. For the test of this hypothesis, the dependent variable (DV) is the *HPKS* score and the independent variable (IV) is the *educational level* attained by the homeowner. Homeowner responses were classified into five groups: *HS Diploma or less* (n = 211), *Some college up to AA/AS Degree* (n = 512), *Bachelor's Degree* (n = 385), *Master's*

Degree (*n* = 190), and *Doctoral Degrees* (*n* = 34). The *HPKS scores* increased from Floridian homeowners with *HS Diploma or less* (*M* = 39.68, *SD* = 9.00), to *Some college up to AA/AS Degree* (*M* = 40.83, *SD* = 9.11), to *Master's Degree* (*M* = 40.95, *SD* = 8.33), to *Doctoral Degree* (*M* = 41.35, *SD* = 9.41), to *Bachelor's Degree* (*M* = 41.37, *SD* = 8.50) in that order (Figure 4-2).

For the one-way ANOVA, some assumptions must first be verified. As mentioned in the Data Analysis section of the Methodology chapter, the three assumptions based on instrument design held true for all of the analyses. The last three assumptions were confirmed through statistical tests. The first of these remaining assumptions was d) no significant outliers in the IV groups in terms of the DV. Of the 1,332 homeowner responses from Florida, only one outlier was found. This outlier can be observed in the boxplots of *HPKS* scores by *Education Levels* in Figure 4-3.

The next assumption is that e) the DV should be approximately normally distributed in each of the IV groups. This was confirmed through the boxplots of Figure 4-3 supplemented by normal Q-Q plots, stem & leaf plots, and histograms of each of the *Educational Levels*. Finally, the last assumption was that of f) homogenous variances between groups. There was homogeneity of variances, as assessed by Levene's test for equality of variances (*p* = .454).

The *HPKS* scores were found to not vary significantly between the different *Educational Levels* in Florida, *F*(4, 1327) = 1.30, *p* = .270. The full ANOVA table is available as Table 4-11.

$H1_{B2}$: Homeowners from across the study area attaining *lower levels of education* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners.

The descriptive statistics of the *Hurricane-Preparedness Knowledge Scale (HPKS)* scores by *Education Levels* are shown in Table 4-12. For the test of this hypothesis, the dependent variable (DV) is the *HPKS* score and the independent variable (IV) is the *Education Level*. The *HPKS* scores increased from homeowners holding a *HS Diploma or less* (n = 308, M = 39.75, SD = 9.22), to those holding *Doctoral Degrees* (n = 56, M = 40.50, SD = 9.12), to those attending *Some college up to AA/AS Degrees* (n = 730, M = 40.70, SD = 9.13), to those holding *Bachelor's Degrees* (n = 567, M = 41.35, SD = 8.52), to those holding *Master's Degrees* (n = 282, M = 41.46, SD = 8.19) in that order (Figure 4-4).

A one-way ANOVA was conducted to determine if the *HPKS* score was different for homeowners with different *Educational Levels*. As mentioned in the Data Analysis section of the Methodology chapter, the three assumptions based on instrument design held true for all of the analyses. The last three assumptions were confirmed through statistical tests. In the first remaining assumption of no outliers, there was only one outlier out of the sample of 1,943, as assessed by percentile output and the outlier labeling rule; data was normally distributed for each group, as assessed by normal Q-Q plots, histograms, and stem & leaf plots. There was homogeneity of variances, as assessed by Levene's test for equality of variances (p = .189).

The *HPKS* scores were found to not vary significantly between the different *Educational Levels*, $F(4, 1938) = 2.07$, p = .082. The full ANOVA table is available as Table 4-13.

Household income

$H1_{C1}$: Florida homeowners with *lower levels of household income* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners within the state.

The descriptive statistics of the *Hurricane-Preparedness Knowledge Scale (HPKS)* by Floridian homeowners' *Household Incomes* are shown in Table 4-14. For the test of this hypothesis, the dependent variable (DV) is the *HPKS* score and the independent variable (IV) is the *Household Incomes*. Floridian homeowner responses were classified into eight income categories: *Up to $14,999* (*n* = 59), *$15,000-$24,999* (*n* = 95), *$25,000-$34,999* (*n* = 157), *$35,000-$49,999* (*n* = 192), *$50,000-$74,999* (*n* = 353), *$75,000-$99,999* (*n* = 243), *$100,000-$149,999* (*n* = 160), and *$150,000 or more* (*n* = 73). The *HPKS* scores increased from *Up to $14,999* (*M* = 36.37, *SD* = 9.13), to *$15,000-$24,999* (*M* = 39.53, *SD* = 8.84), to *$25,000-$34,999* (*M* = 39.57, *SD* = 8.79), to *$35,000-$49,999* (*M* = 40.59, *SD* = 9.15), to *$50,000-$74,999* (*M* = 40.60, *SD* = 8.60), to *$100,000-$149,999* (*M* = 41.58, *SD* = 8.60), to *$75,000-$99,999* (*M* = 42.64, *SD* = 8.62), to *$150,000 or more* (*M* = 43.01, *SD* = 8.07), in that order (Figure 4-5).

For the one-way ANOVA, some assumptions must first be verified. As mentioned in the Data Analysis section of the Methodology chapter, the three assumptions based on instrument design held true for all of the analyses. The last three assumptions were confirmed through statistical tests. All of these assumptions held true for this analysis. The last three assumptions are confirmed through statistical tests. The first of these remaining assumptions was d) no significant outliers in the IV groups in terms of the DV. Of the 1,332 homeowner responses from Florida, only two outliers were found. These outliers can be seen in the boxplots of the *HPKS* scores by *Household Incomes* in Figure 4-6.

The next assumption is that e) the DV should be approximately normally distributed in each of the IV groups. This was confirmed through the boxplots of Figure

4-6 supported by normal Q-Q plots, stem & leaf plots, and histograms of each *Household Income* category. Finally, the last assumption was that of f) homogenous variances between groups. There was also homogeneity of variances, as assessed by Levene's test for equality of variances (p = .939).

The *HPKS* score was significantly different by *Household Incomes*, $F(7, 1324)$ = 5.35, p < .001. Tukey's post hoc analysis (Table 4-15) revealed that the mean *HPKS* score for Floridian homeowners with *Household Incomes* of *Up to $14,999* (*M* = 36.37, *SD* = 9.13) was significantly lower than Floridian homeowners with *Household Incomes* of *$35,000-$49,999* (*M* = 40.59, *SD* = 9.15), *$50,000-$74,999* (*M* = 40.60, *SD* = 8.60), *$75,000-$99,999* (*M* = 42.64, *SD* = 8.62), *$100,000-$149,999* (*M* = 41.58, *SD* = 8.60), and *$150,000 or more* (*M* = 43.01, *SD* = 8.07). The mean *HPKS* score of Floridian homeowners with *Household Incomes* of *$75,000-$99,999* (*M* = 42.64, *SD* = 8.62) was significantly higher than homeowners in the *$25,000-$34,999* (*M* = 39.57, *SD* = 8.79) *Household Income* category (Table 4-15). All other differences in mean *HPKS* scores by Floridian *Household Incomes* were not found to be significant.

$H1_{C2}$: Homeowners from across the study area with *lower levels of Household Income* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners.

The descriptive statistics of the mean *Hurricane-Preparedness Knowledge Scale (HPKS)* scores by *Household Income* are shown in Table 4-16. For the test of this hypothesis, the dependent variable (DV) is the mean *HPKS* scores and the independent variable (IV) is the *Household Income*. The *HPKS* scores increased from *Up to $14,999* (*n* = 82, *M* = 37.16, *SD* = 9.71), to *$25,000-$34,999* (*n* = 219, *M* = 39.94, *SD* = 9.09), to *$15,000-$24,999* (*n* = 137, *M* = 39.99, *SD* = 8.60), to *$35,000-$49,999* (*n* = 264, *M* =

40.20, *SD* = 8.99), to *$50,000-$74,999* (*n* = 496, *M* = 40.66, *SD* = 8.72), to *$100,000-$149,999* (*n* = 260, *M* = 41.22, *SD* = 8.84), to *$75,000-$99,999* (*n* = 355, *M* = 42.43, *SD* = 8.58), to *$150,000 or more* (*n* = 130, *M* = 42.53, *SD* = 8.03), in that order (Figure 4-7).

A one-way ANOVA was conducted to determine if the *HPKS* score was different for homeowners by *Household Income*. As mentioned in the Data Analysis section of the Methodology chapter, the three assumptions based on instrument design held true for all of the analyses. The remaining three assumptions were confirmed through statistical tests. There was only one outlier out of the sample of 1,943, as assessed by the outlier labeling rule and percentile output; data was normally distributed for each group, as assessed by normal Q-Q plots, histograms, and stem & leaf plots. There was also homogeneity of variances, as assessed by Levene's test for equality of variances (p = .810).

The mean *HPKS* scores were significantly different by *Household Incomes*, $F(7, 1935) = 5.23$, $p < .001$. Tukey's post hoc analysis (Table 4-17) revealed that the mean *HPKS* score for homeowners with *Household Incomes* of *Up to $14,999* (*M* = 37.16, *SD* = 9.71) was significantly lower than *Household Incomes* of *$50,000-$74,999* (*M* = 40.66, *SD* = 8.72), *$75,000-$99,999* (*M* = 42.43, *SD* = 8.58), *$100,000-$149,999* (*M* = 41.22, *SD* = 8.84), and *$150,000 or more* (*M* = 42.53, *SD* = 8.03). The mean *HPKS* score from homeowners with *Household Incomes* of *$75,000-$99,999* (*M* = 42.43, *SD* = 8.58) was significantly higher than homeowners in the *$25,000-$34,999* (*M* = 39.94, *SD* = 9.09) and *$35,000-$49,999* (*M* = 40.20, *SD* = 8.99) *Household Income* categories (Table 4-17). All other differences in mean *HPKS* scores by *Household Incomes* were not found to be significant.

Age of homeowner

$H1_{D1}$: Florida homeowners who are *younger* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners within the state.

The descriptive statistics of the *Hurricane-Preparedness Knowledge Scale (HPKS)* by Floridian homeowners' *Age* is shown in Table 4-18. For the test of this hypothesis, the dependent variable (DV) is the *HPKS* score and the independent variable (IV) is the Floridian homeowners' *Age*. Homeowner responses were classified into five *Age* categories: *25-34 years old* (*n* = 162), *35-44 years old* (*n* = 199), *45-54 years old* (*n* = 261), to *55-64 years old* (*n* = 372), to *65-75 years old* (*n* = 338). The *HPKS* scores increased from Floridian homeowners *65-75 years old* (*n* = 338, *M* = 40.22, *SD* = 8.83), to *45-54 years old* (*n* = 261, *M* = 40.40, *SD* = 8.97), to *35-44 years old* (*n* = 199, *M* = 40.64, *SD* = 8.99), to *55-64 years old* (*n* = 372, *M* = 41.17, *SD* = 8.41), to *25-34 years old* (*n* = 162, *M* = 42.28, *SD* = 9.21), in that order (Figure 4-8).

For the one-way ANOVA, some assumptions must first be verified. As mentioned in the Data Analysis section of the Methodology chapter, the three assumptions based on instrument design held true for all of the analyses. The last three assumptions were confirmed through statistical tests. The last three assumptions are confirmed through statistical tests. The first of these remaining assumptions was d) no significant outliers in the IV groups in terms of the DV. Of the 1,332 homeowner responses from Florida, only one outlier was found. This outlier can be seen in the boxplots of *HPKS* scores by homeowners' *Age* categories in Figure 4-9.

The next assumption is that e) the DV should be approximately normally distributed in each of the IV groups. This was confirmed through the normal Q-Q plots, stem & leaf plots, and histograms of each homeowners' *Age* category. Finally, the last assumption was that of f) homogenous variances between groups. There was also homogeneity of variances, as assessed by Levene's test for equality of variances (p = .480).

The *HPKS* scores were found to not vary significantly between the different *Age* categories of Floridian Homeowners, $F(4, 1327) = 1.82$, $p = .123$. The full ANOVA table is available as Table 4-19.

$H1_{D2}$: Homeowners from across the study area who are *younger* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners.

The descriptive statistics of the *Hurricane-Preparedness Knowledge Scale (HPKS)* by homeowners' *Age* is shown in Table 4-20. For the test of this hypothesis, the dependent variable (DV) is the *HPKS* score and the independent variable (IV) is the homeowners' *Age*. The *HPKS scores* increased from homeowners *65-75 years old* (n = 452, M = 40.22, SD = 8.83), to *45-54 years old* (n = 403, M = 40.40, SD = 8.97), to *35-44 years old* (n = 305, M = 40.64, SD = 8.99), to *55-64 years old* (n = 534, M = 41.17, SD = 8.41), to *25-34 years old* (n = 249, M = 42.28, SD = 9.21), in that order (Figure 4-10).

For the one-way ANOVA, some assumptions must first be verified. As mentioned in the Data Analysis section of the Methodology chapter, the three assumptions based on instrument design held true for all of the analyses. The last three assumptions were confirmed through statistical tests. The last three assumptions are confirmed through statistical tests. The first of these remaining assumptions was d) no significant outliers in the IV groups in terms of the DV. There were no outliers in this analysis as confirmed by the outlier labeling rule.

The next assumption is that e) the DV should be approximately normally distributed in each of the IV groups. This was confirmed through the normal Q-Q plots, stem & leaf plots, and histograms of each homeowner's *Age* category. Finally, the last assumption was that of f) homogenous variances between groups. There was also homogeneity of variances, as assessed by Levene's test for equality of variances (p = .261).

The *HPKS* scores were found to vary significantly between the different *Age* categories of homeowners, $F(4, 1938) = 2.52$, $p = .039$. Despite the ANOVA finding significant differences in means of *HPKS* scores between *Age* categories, the Tukey's post hoc analysis was unable to distinguish which categories were significantly different. The full ANOVA table is available as Table 4-21.

Research Question 2: Trust in Support Entities

This study's second research question sought to quantify to what extent the same demographic characteristics (*location, education, income*, and *age*) could predict homeowners' self-reported score on this study's *Trust in Support Entities Scale (TSES)*. The affect of each of these demographic characteristics will first be explored within the state of Florida, then once again across the study area.

Location of home

$H2_{A1}$: Homeowners located in the counties of Florida's *Panhandle* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other *Regions* within the state.

The descriptive statistics of the *Trust in Support Entities Scale (TSES)* by *Florida Region* are shown in Table 4-22. For the test of this hypothesis, the dependent variable (DV) is the *TSES* score and the independent variable (IV) is the *location* represented by the *Florida Region*. Homeowner responses were classified into six groups: *North Florida* (*n* = 163), *West Coast* (*n* = 412), *Panhandle* (*n* = 46), *East Coast* (*n* = 350), *South Florida* (*n* = 305), and *Northwest* (*n* = 56). The *TSES* scores increased from *North Florida* (*n* =163, *M* = 31.44, *SD* = 8.08), to the *West Coast* of Florida (*n* =412, *M* = 31.90, *SD* = 7.87), to the *Panhandle* of Florida (*n* =46, *M* = 32.09, *SD* = 7.88), to the *East Coast* of Florida (*n* = 350, *M* = 32.99, *SD* = 7.65), to *South Florida* (*n* =305, *M* = 33.82, *SD* = 7.83), to *Northwest Florida* (*n* =56, *M* = 34.34, *SD* = 8.58), in that order (Table 4-22).

For the one-way ANOVA, some assumptions must first be verified. As mentioned in the Data Analysis section of the Methodology chapter, the three assumptions based on instrument design held true for all of the analyses. The last three assumptions were confirmed through statistical tests. The last three assumptions are confirmed through statistical tests. The first of these remaining assumptions was d) no significant outliers in the IV groups in terms of the DV. Of the 1,332 homeowner responses from Florida, only six total outliers were found. These outliers can be seen in the boxplots of *TSES* scores by Florida *Region* in Figure 4-11.

The next assumption is that e) the DV should be approximately normally distributed in each of the IV groups, however the one-way ANOVA is considered robust to violations of normality. This is why an “approximately” normal distribution is assumed. This was confirmed through the normal Q-Q plots, stem & leaf plots, and histograms of each *Region*. Finally, the last assumption was that of f) homogenous variances between groups. In this case, there was homogeneity of variances, as assessed by Levene’s test for equality of variances (*p* = .766).

The mean *TSES* scores were significantly different by the *Regions* of Florida, $F(5,1326) = 3.56$, $p = .003$. Tukey's post hoc analysis (Table 4-23) revealed that the mean *TSES* score of North Florida ($M = 31.44$, $SD = 8.08$) and of the *West Coast* of Florida ($M = 31.90$, $SD = 7.87$) were significantly lower than the mean score of homeowners in *South Florida* ($M = 33.82$, $SD = 7.83$). The *TSES* scores from the *Northwest, East Coast*, and *Panhandle* of Florida were not significantly different than any other *Regions* of Florida.

$H2_{A2}$: Homeowners located in *Louisiana* will self-report lower scores on this study's *Trust in Support Entities Scale* than other *States* within the study area.

The descriptive statistics of the *Trust in Support Entities Scale (TSES)* by *State* are shown in Table 4-24. For the test of this hypothesis, the dependent variable (DV) is the *TSES* score and the independent variable (IV) is the *location* represented by the *States*. As previously mentioned, there was a low sample collected in the smaller areas of Alabama and Mississippi, and for this reason, these two states were combined to form a single area. Homeowner responses were classified into five groups: Southeastern *Georgia* ($n = 106$), *Florida* ($n = 1,332$), and the gulf coast counties of *Texas* ($n = 329$), the combined area of *Alabama & Mississippi* ($n = 55$) and *Louisiana* ($n = 121$). The *TSES* scores increased from *Georgia* ($M = 29.39$, $SD = 7.97$), to the *Texas* ($M = 31.58$, $SD = 7.79$), to *Louisiana* ($M = 31.93$, $SD = 7.84$), to *Florida* ($M = 32.68$, $SD = 7.90$), to the combined area of *Alabama & Mississippi* ($M = 34.00$, $SD = 8.84$), in that order (Table 4-24).

All of the assumptions based on instrument design held true for this analysis. The last remaining assumptions were a) no significant outliers in the IV groups in terms of the DV. Of the 1,943 homeowner responses, only six outliers were found. These outliers can be seen in the boxplots of *TSES* scores by *State* in Figure 4-12

The next assumption is that b) the DV should be approximately normally distributed in each of the IV groups. This was confirmed through the normal Q-Q plots, stem & leaf plots, and histograms of each *State*. Finally, the last assumption was that of c) homogenous variances between groups. In this case, there was homogeneity of variances, as assessed by Levene's test for equality of variances (p = .922).

The mean *TSES* scores were significantly different by the *States*, $F(4,1938)$ = 5.74, p < .001. Tukey's post hoc analysis (Table 4-25) revealed that the mean *TSES* score of *Georgia* (M = 29.39, SD = 7.97) was significantly lower than the mean score of homeowners in *Florida* (M = 32.68, SD = 7.90) and the combined area of *Alabama & Mississippi* (M = 34.00, SD = 8.84). The mean *TSES* scores from *Louisiana* and *Texas* were not significantly different than any other *States*.

Highest education level of homeowner

$H2_{B1}$: Florida homeowners attaining *less than a bachelor's degree* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other homeowners within the state.

The descriptive statistics of the *Trust of Support Entities Scale (TSES)* by homeowners' *Education Levels* in Florida are shown in Table 4-26. For the test of this hypothesis, the dependent variable (DV) is the *TSES* score and the independent variable (IV) is the *Education Levels* attained by the homeowner. Homeowner responses were classified into five groups: *HS Diploma or less* (n = 211), *Some college up to AA/AS Degree* (n = 512), *Bachelor's Degree* (n = 385), *Master's Degree* (n = 190), and *Doctoral Degrees* (n = 34). The *TSES* scores increased from Floridian homeowners with a *Doctoral Degree* (M = 31.29, SD = 8.67), to *Master's Degree* (M = 31.58, SD =

7.86), to *Some college up to AA/AS Degree* (*M* = 32.52, *SD* = 7.91), to *Bachelor's Degree* (*M* = 33.25, *SD* = 7.75), to *HS Diploma or less* (*M* = 33.25, *SD* = 7.96), in that order (Figure 4-13).

For the one-way ANOVA, some assumptions must first be verified. The three assumptions based on instrument design held true for this analysis, as mentioned in the Data Analysis section of the Methodology chapter. The last three assumptions are confirmed through statistical tests. The first of these remaining assumptions was d) no significant outliers in the IV groups in terms of the DV. Of the 1,332 homeowner responses from Florida, only six outliers were found. These outliers can be seen in the boxplots of *HPKS* scores by *Education Levels* in Figure 4-14.

The next assumption is that e) the DV should be approximately normally distributed in each of the IV groups. This was confirmed through the normal Q-Q plots, stem & leaf plots, and histograms of each of the *Education Levels*. Finally, the last assumption was that of f) homogenous variances between groups. There was also homogeneity of variances, as assessed by Levene's test for equality of variances (p = .997).

The *TSES* scores were found to not vary significantly between the different *Education Levels* in Florida, $F(4, 1327) = 2.02$, $p = .090$. The full ANOVA table is available as Table 4-27.

$H2_{B2}$: Homeowners from across the study area attaining *less than a bachelor's degree* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)*.

The descriptive statistics of the *Trust in Support Entities Scale (TSES)* by *Education Level* are shown in Table 4-28. For the test of this hypothesis, the dependent variable (DV) is the *TSES* score and the independent variables (IV) are the *Education*

Levels. The *TSES* scores increased from homeowners holding a *Doctoral Degree* (*n* = 56, *M* = 31.23, *SD* = 7.71), to those holding *Master's Degrees* (*n* = 282, *M* = 31.35, *SD* = 8.16), to those attending *Some college up to AA/AS Degrees* (*n* = 730, *M* = 32.17, *SD* = 7.96), to those holding *Bachelor's Degrees* (*n* = 567, *M* = 32.75, *SD* = 7.65), to those holding a *HS Diploma or less* (*n* = 308, *M* = 32.87, *SD* = 8.24), in that order (Figure 4-15).

For the one-way ANOVA, some assumptions must first be verified. The three assumptions based on instrument design held true for this analysis, as mentioned in the Data Analysis section of the Methodology chapter. The last three assumptions are confirmed through statistical tests. The first of these remaining assumptions was d) no significant outliers in the IV groups in terms of the DV. Of the 1,943 homeowner responses, seven outliers were found. These outliers can be seen in the boxplots of *HPKS* scores by *Education Levels* in Figure 4-16.

The next assumption is that e) the DV should be approximately normally distributed in each of the IV groups. This was confirmed through the normal Q-Q plots, stem & leaf plots, and histograms of each *Education Level*. Finally, the last assumption was that of f) homogenous variances between groups. There was also homogeneity of variances, as assessed by Levene's test for equality of variances (*p* = .912).

The *TSES* scores were found to not vary significantly between the different *Education Levels*, $F(4, 1938) = 2.17$, $p = .070$. The full ANOVA table is available as Table 4-29.

Household income

$H2_{C1}$: Florida homeowners with *lower levels of Household Income* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other homeowners within the state.

The descriptive statistics of the *Trust of Support Entities Scale (TSES)* by Floridian homeowners' *Household Incomes* are shown in Table 4-30. For the test of this hypothesis, the dependent variable (DV) is the *TSES* score and the independent variable (IV) is the *Household Income*. Floridian homeowner responses were classified into eight income categories: *Up to $14,999* (*n* = 59), *$15,000-$24,999* (*n* = 95), *$25,000-$34,999* (*n* = 157), *$35,000-$49,999* (*n* = 192), *$50,000-$74,999* (*n* = 353), *$75,000-$99,999* (*n* = 243), *$100,000-$149,999* (*n* = 160), and *$150,000 or more* (*n* = 73). The *TSES* scores increased from *Up to $14,999* (*M* = 32.32, *SD* = 9.24), to *$50,000-$74,999* (*M* = 32.50, *SD* = 7.74), to *$35,000-$49,999* (*M* = 32.58, *SD* = 8.12), to *$100,000-$149,999* (*M* = 32.69, *SD* = 7.95), to *$15,000-$24,999* (*M* = 32.83, *SD* = 7.05), to *$150,000 or more* (*M* = 32.84, *SD* = 7.91), to *$25,000-$34,999* (*M* = 32.85, *SD* = 7.73), to *$75,000-$99,999* (*M* = 32.88, *SD* = 8.07), in that order (Figure 4-17).

For the one-way ANOVA, some assumptions must first be verified. The three assumptions based on instrument design held true for this analysis, as mentioned in the Data Analysis section of the Methodology chapter. The last three assumptions are confirmed through statistical tests. The first of these remaining assumptions was d) no significant outliers in the IV groups in terms of the DV. Of the 1,332 homeowner responses from Florida, only six outliers were found. These outliers can be seen in the boxplots of the *HPKS* scores by *Household Incomes* in Figure 4-18.

The next assumption is that e) the DV should be approximately normally distributed in each of the IV groups. This was confirmed through the normal Q-Q plots, stem & leaf plots, and histograms of each *Household Income* category. Finally, the last assumption was that of f) homogenous variances between groups. There was also homogeneity of variances, as assessed by Levene's test for equality of variances (p = .725).

The *TSES* scores were found to not vary significantly between the different *Household Income* categories of Floridian homeowners, $F(7, 1324) = 0.087$, $p = .999$. The full ANOVA table is available as Table 4-31.

H2$_{C2}$: Homeowners from across the study area with *lower levels of Household Income* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other homeowners.

The descriptive statistics of the mean *Trust in Support Entities Scale (TSES)* scores by *Household Income* are shown in Table 4-32. For the test of this hypothesis, the dependent variable (DV) is the *TSES* scores and the independent variable (IV) is the *Household Incomes*. The *TSES* scores increased from *Up to $14,999* ($n$ = 82, M = 31.40, SD = 9.77), to *$100,000-$149,999* (n = 260, M = 31.85, SD = 7.82), to *$50,000-$74,999* (n = 496, M = 32.04, SD = 7.94), to *$150,000 or more* ($n$ = 130, M = 32.12, SD = 7.58) to *$35,000-$49,999* (n = 264, M = 32.45, SD = 7.94), to *$75,000-$99,999* (n = 355, M = 32.52, SD = 7.94), to *$15,000-$24,999* (n = 137, M = 32.69, SD = 7.13), to *$25,000-$34,999* (n = 219, M = 33.12, SD = 8.12), in that order (Figure 4-19).

A one-way ANOVA was conducted to determine if the *TSES* score was different for homeowners by *Household Income*. The three assumptions based on instrument design held true for this analysis, as mentioned in the Data Analysis section of the Methodology chapter. The last three assumptions are confirmed through statistical tests. There were only seven outliers out of the sample of 1,943, as assessed by outlier labeling rule; data was normally distributed for each group, as assessed by normal Q-Q plots, histograms, and stem & leaf plots. There was also homogeneity of variances, as assessed by Levene's test for equality of variances (p = .235).

The *TSES* scores were found to not vary significantly between the different *Household Income* categories of homeowners, $F(7, 1935) = 0.790$, p = .596. The full ANOVA table is available as Table 4-33.

Age of homeowner

$H2_{D1}$: Florida homeowners who are *younger* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other homeowners within the state.

The descriptive statistics of the *Trust in Support Entities Scale (TSES)* by Floridian homeowners' age is shown in Table 4-34. For the test of this hypothesis, the dependent variable (DV) is the *TSES* score and the independent variable (IV) is the Floridian homeowners' *Age*. Homeowner responses were classified into five *Age* categories: *25-34 years old* (n = 162), *35-44 years old* (n = 199), *45-54 years old* (n = 261), to *55-64 years old* (n = 372), to *65-75 years old* (n = 338). The *TSES* scores increased from Floridian homeowners *45-54 years old* (M = 31.38, SD = 8.44), to *65-75 years old* (M = 31.77, SD = 7.52), to *55-64 years old* (M = 32.96, SD =7.48), to 3*5-44 years old* (M = 33.76, SD = 7.44), to *25-34 years old* (M = 34.70, SD = 8.66), in that order (Figure 4-20).

For the one-way ANOVA, some assumptions must first be verified. The first three assumptions are based on the design of the study instrument. These assumptions are a) the dependent variable (DV) is continuous, b) the independent variable (IV) is categorical with two or more independent groups, and c) the cases (homeowner responses) are independent. All of these assumptions held true for this analysis. The last three assumptions are confirmed through statistical tests. The first of these remaining assumptions was d) no significant outliers in the IV groups in terms of the DV. There were no outliers observed by comparing the extreme values to the range calculated by the outlier labeling rule.

The next assumption is that e) the DV should be approximately normally distributed in each of the IV groups. This was confirmed by observing normal Q-Q plots, stem & leaf plots, and histograms of each homeowners' *Age* category. Finally, the last assumption was that of f) homogenous variances between groups. There was also homogeneity of variances, as assessed by Levene's test for equality of variances (p = .060).

The *TSES* score was significantly different for the different categories of Floridian homeowners' *Ages*, $F(4,1327) = 6.71$, $p < .001$. Tukey's post hoc analysis (Table 4-35) revealed that the mean *TSES* score of homeowners *45-54 years old* (M = 31.38, SD = 8.44) and *65-75 years old* (M = 31.77, SD = 7.52) were significantly lower than the mean scores of Floridian homeowners aged *35-44 years old* (M = 33.76, SD = 7.44) and *25-34 years old* (M = 34.70, SD = 8.66). The *TSES* scores from Floridians aged *55-64 years old* (M = 32.96, SD = 7.48) was not significantly different than any other *Age* categories in Florida.

$H2_{D2}$: Homeowners from across the study area who are *younger* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other homeowners.

The descriptive statistics of the *Trust in Support Entities Scale (TSES)* by homeowners' *Age* is shown in Table 4-36. For the test of this hypothesis, the dependent variable (DV) is the *TSES* score and the independent variable (IV) is the *Homeowners' Age*. The *TSES* increased from homeowners *45-54 years old* (n = 403, M = 30.86, SD =

8.39), to *65-75 years old* (*n* = 452, *M* = 31.65, *SD* = 7.49), to *55-64 years old* (*n* = 534, *M* = 32.66, *SD* = 7.59), to *35-44 years old* (*n* = 305, *M* = 33.20, *SD* = 7.62), to *25-34 years old* (*n* = 249, *M* = 34.00, *SD* = 8.66), in that order (Figure 4-21).

For the one-way ANOVA, some assumptions must first be verified. The first three assumptions are based on the design of the study instrument. These assumptions are a) the dependent variable (DV) is continuous, b) the independent variable (IV) is categorical with two or more independent groups, and c) the cases (homeowner responses) are independent. All of these assumptions held true for this analysis. The last three assumptions are confirmed through statistical tests. The first of these remaining assumptions was d) no significant outliers in the IV groups in terms of the DV. Of the 1,943 homeowner responses, seven outliers were found by comparing the extreme values of each category to the range produced by the outlier labeling rule.

The next assumption is that e) the DV should be approximately normally distributed in each of the IV groups. This was confirmed by observing normal Q-Q plots, stem & leaf plots, and histograms of each homeowners' *Age* category. Finally, the last assumption was that of f) homogenous variances between groups. The assumption of homogeneity of variances was violated, as assessed by Levene's test for equality of variances (*p* = .035).

Due to the assumptions not holding true, a Welch ANOVA was performed. The *TSES* score was significantly different for the different categories of homeowners' *Ages*, Welch's *F*(4, 855.14) = 7.54, *p* < .001. Games-Howell post hoc analysis (Table 4-37) revealed that the mean *TSES* score of homeowners *45-54 years old* (*M* = 30.86, *SD* = 8.39) were significantly lower than the mean scores of homeowners *55-64 years old* (*M*

= 32.66, *SD* = 7.59), *35-44 years old* (*M* = 33.20, *SD* = 7.62), and *25-34 years old* (*M* = 34.00, *SD* = 8.66). The mean *TSE Scale* score from homeowners *65-75 years old* (*M* = 31.65, *SD* = 7.49) was significantly lower than homeowners *35-44 years old* (*M* = 33.20, *SD* = 7.62), and *25-34 years old* (*M* = 34.00, *SD* = 8.66).

Multiple Regression Modeling

Multiple regression modeling was used to determine if the four demographic characteristics (*location, education, income*, and *age*) could be used to predict a homeowner's score on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)*. The protocol of these analyses followed a similar pattern as established by the previous Exploring Differences Between Groups section. There were four independent multiple regression models explored; HPKS in Florida then study area, followed by TSES in Florida then study area.

Hurricane-Preparedness Knowledge Scale

Florida regions

This analysis explored the predictive ability that the demographic characteristics (*location, education, income*, and *age*) had in relation to the *Hurricane-Preparedness Knowledge Scale (HPKS)* scores of Floridian homeowners. As explained in the Multiple Regression Modeling section of the Methodology chapter, assumptions needed to be verified before any regression models could be further explored. There was independence of residual, as assessed by a Durbin-Watson statistic of 2.028.

The scatterplots of the studentized residuals against the standardized predicted values were examined to verify that overall linear relationships exist as well as the existence of homoscedasticity (Figure 4-22). No indication of non-linearity was identified, however in the interest of being comprehensive, the individual partial regression plots of the independent variables were explored as well (Figure 4-23). Note that *education* and *age* were excluded due to not being significant. In respect to homoscedasticity, the scatterplots were examined for the typical patterns that violate this assumption, such as a distribution that was not approximately equal for all values of the predicted dependent variable (Figure 4-22).

The next assumption was checking that multicollinearity did not exist between independent variables. The verification of this assumption entailed two steps. First, the correlation table was examined for any values greater than 0.7 (Table 4-38). The highest correlation was only 0.37, thus this step was verified. The second step required data from the coefficients table.

The tolerance values for each IV from the Coefficients of *HPKS* table, Table 4-40, was verified to be greater than 0.1. This satisfied the assumption that no multicollinearity existed in the data. The next assumption involved checking for outliers in the data. This was verified through the standard residual values from the casewise diagnostics table provided by SPSS. This produced only three outliers among the 1,332 Floridian homeowner responses. Due to their very small influence on the analysis these outliers were left in the dataset. The leverage values that were produced during the multiple regression analysis were examined for any risky (0.20 to 0.49) or dangerous (0.50 or above) values. The highest leverage value in Florida was 0.010 thus satisfying this assumption. The Cook's Distance values were then checked to be less than 1.0. The highest Cook's Distance value for the Floridian homeowners was 0.014, thus indicating no highly influential points.

The last assumption to be confirmed was that the residuals were normally distributed. This was done through a histogram of the *HPKS* score frequency against the regression standardized residuals (Figure 4-24). As well as visual verification of normality, the mean and standard deviation were verified as very near 0 and 1 respectively. One last confirmatory check of normality was to check the normal P-P plot for adherence to the diagonal line produced.

With all of the assumptions verified, the interpretation of the output was allowed to continue. By interpreting the individual significance of the IVs from the coefficient table (Table 4-40), it was observed that *Education* (p = .624) and *Age* (p = .276) were not significant. Model 1 consisted of two of the original four IVs. By interpreting the model summary, Table 4-39, it was determined that this model explained 5.1% of the variance of the *HPKS* scores. *Florida Region* and *Income* significantly predict *HPKS* scores, $F(2,1329) = 36.688$, $p < .001$, adj. $R^2 = .051$.

Study area

This analysis explored the predictive ability that the demographic characteristics (*location, education, income*, and *age*) had in relation to the *Hurricane-Preparedness Knowledge Scale (HPKS)* scores of homeowners across the study area. There was independence of residual, as assessed by a Durbin-Watson statistic of 1.918. The assumptions of linearity and homoscedasticity were verified through the scatterplots. There only existed six outliers from the 1,943 homeowner responses of the data set, they were retained in the analysis. The normality of the residuals assumption was confirmed as well.

In this analysis, Location was represented by the State variable. As in the Florida model, the Education (p = .787) and Age (p = .942) variables were both found to not significantly contribute to the model. The *State* and *Income* variables were found to significantly predict *HPKS* scores, $F(2, 1940) = 19.4119$, $p < .001$, adj. $R^2 = .019$ (Tables 4-41 & 4-42).

Trust in Support Entities Scale

Florida regions

This analysis explored the predictive ability that the demographic characteristics (*location, education, income*, and *age*) had in relation to the *Trust in Support Entities Scale (TSES)* scores of Floridian homeowners. The assumptions of linearity, independence of errors, homoscedasticity, and normality of residuals were all met. There were seven outliers identified of the 1,332 homeowner responses. The variable of *Income* ($p = .670$) was found to not significantly add to the model. The variables of *Florida Region* ($p < .001$), *Age* ($p < .005$), and *Education* ($p < .05$) statistically significantly predicted *TSES* scores of Floridian homeowners, $F(3, 1328) = 10.892$, $p < .001$, adj. $R^2 = .022$ (Tables 4-43 & 4-44).

Study area

This analysis explored the predictive ability that the demographic characteristics (*location, education, income*, and *age*) had in relation to the *Trust in Support Entities Scale (TSES)* scores of homeowners across the study area. The assumptions of linearity, independence of errors, homoscedasticity, and normality of residuals were all met. There were eight outliers identified of the 1,943 homeowner responses. The variables of *Education* ($p = .165$), and *Income* ($p = .544$) were both found to not significantly add to the model. The variables of *State* ($p < .001$) and *Age* ($p < .005$) statistically significantly predicted *TSES* scores of homeowners, $F(2, 1940) = 15.833$, $p < .001$, adj. $R^2 = .015$ (Tables 4-45 & 4-46).

Table 4-1. Initial PCA total variance explained

Component	Initial eigenvalues Total	% of Variance	Cumulative %	Rotation sums of squared loadings Total	% of Variance	Cumulative %
1	9.277	20.616	20.616	5.315	11.811	11.811
2	4.178	9.285	29.901	4.246	9.436	21.247
3	3.486	7.747	37.648	3.603	8.008	29.255
4	2.380	5.289	42.937	3.186	7.079	36.334
5	1.973	4.385	47.323	2.745	6.101	42.435
6	1.788	3.974	51.297	2.337	5.193	47.628
7	1.122	2.492	53.789	1.960	4.356	51.984
8	1.032	2.293	56.082	1.844	4.099	56.082

Table 4-2. Revised PCA total variance explained

Component	Initial eigenvalues Total	% of variance	Cumulative %	Rotation sums of squared loadings Total	% of variance	Cumulative %
1	6.373	21.975	21.975	4.139	14.272	14.272
2	3.678	12.681	34.657	4.028	13.890	28.161
3	2.790	9.621	44.278	2.793	9.632	37.794
4	1.959	6.757	51.035	2.597	8.955	46.749
5	1.647	5.680	56.714	2.573	8.872	55.621
6	1.423	4.907	61.621	1.740	6.000	61.621

Table 4-3. Split sample validation comparison

	KMO measure of sampling adequacy	Bartlett's test of sphericity	Number of components	% of variance explained	% in same components	% same factor loading order
Whole sample	0.878	$p < .001$	6	61.62%	100%	100.00%
Rnd half 1	0.874	$p < .001$	6	62.06%	100%	79.31%
Rnd half 2	0.873	$p < .001$	6	61.94%	100%	72.41%

Table 4-4. Rotated component matrix

	HPKS	TSES
Q4.52	0.812	
Q4.39	0.794	
Q4.37	0.793	
Q4.30	0.767	
Q4.22	0.689	
Q4.45	0.591	
Q4.15		0.782
Q4.27		0.756
Q4.14		0.733
Q4.16		0.632
Q4.26	.422	0.627

Table 4-5. Descriptive statistics for the *HPKS* and *TSES*

	No. of items	*M (SD)*	Skewness	Kurtosis	Cronbach's α
HPKS	6	40.84 (8.85)	-0.11	-0.06	0.88
TSES	5	32.31 (7.95)	-0.24	0.41	0.80

Table 4-6. Descriptive statistics of *HPKS scores* by *Region of Florida*

					95% confidence interval for mean			
	N	Mean	Std. deviation	Std. error	Lower bound	Upper bound	Minimum	Maximum
North Florida	163	38.96	8.71	.68	37.61	40.30	19.00	60.00
West Coast	412	39.22	8.94	.44	38.36	40.09	6.00	60.00
Panhandle	46	40.48	7.50	1.11	38.25	42.70	24.00	59.00
East Coast	350	41.47	8.80	.47	40.55	42.40	9.00	60.00
South Florida	305	42.71	8.47	.48	41.76	43.67	22.00	60.00
Northwest	56	44.25	8.07	1.08	42.09	46.41	31.00	60.00
Total	1332	40.83	8.82	.24	40.36	41.31	6.00	60.00

Table 4-7. Tukey's post hoc of *HPKS scores* by *Region of Florida*

	(I) FL_Reg	(J) FL_Reg	Mean difference (I-J)	Std. error	Sig.	95% confidence interval Lower bound	Upper bound
Tukey HSD	Northwest	Panhandle	3.77	1.73	0.25	-1.16	8.71
		North Florida	*5.29	1.35	0.00	1.45	9.13
		West Coast	*5.03	1.24	0.00	1.50	8.56
		East Coast	2.78	1.25	0.23	-0.79	6.34
		South Florida	1.54	1.26	0.83	-2.07	5.14
	Panhandle	Northwest	-3.77	1.73	0.25	-8.71	1.16
		North Florida	1.52	1.45	0.90	-2.62	5.66
		West Coast	1.26	1.35	0.94	-2.60	5.11
		East Coast	-1.00	1.36	0.98	-4.88	2.89
		South Florida	-2.23	1.37	0.58	-6.15	1.69
	North Florida	Northwest	*-5.29	1.35	0.00	-9.13	-1.45
		Panhandle	-1.52	1.45	0.90	-5.66	2.62
		West Coast	-0.26	0.80	0.00	-2.56	2.03
		East Coast	*-2.52	0.82	0.03	-4.87	-0.17
		South Florida	*-3.75	0.84	0.00	-6.16	-1.35
	West Coast	Northwest	*-5.03	1.24	0.00	-8.56	-1.50
		Panhandle	-1.26	1.35	0.94	-5.11	2.60
		North Florida	0.26	0.80	1.00	-2.03	2.56
		East Coast	*-2.25	0.63	0.01	-4.06	-0.45
		South Florida	*-3.49	0.66	0.00	-5.36	-1.62
	East Coast	Northwest	-2.78	1.25	0.23	-6.34	0.79
		Panhandle	1.00	1.36	0.98	-2.89	4.88
		North Florida	*2.52	0.82	0.03	0.17	4.87
		West Coast	*2.25	0.63	0.01	0.45	4.06
		South Florida	-1.24	0.68	0.45	-3.18	0.70
	South Florida	Northwest	-1.54	1.26	0.83	-5.14	2.07
		Panhandle	2.23	1.37	0.58	-1.69	6.15
		North Florida	*3.75	0.84	0.00	1.35	6.16
		West Coast	*3.49	0.66	0.00	1.62	5.36
		East Coast	1.24	0.68	0.45	-0.70	3.18

* The mean difference is significant at the 0.05 level.

Table 4-8. Descriptive statistics of *HPKS* scores by *States*

	N	Mean	Std. deviation	Std. error	95% confidence interval for mean Lower bound	Upper bound	Minimum	Maximum
Georgia	106	37.32	9.44	0.92	35.50	39.14	12	58
Florida	1332	40.83	8.82	0.24	40.36	41.31	6	60
Texas	329	41.13	8.74	0.48	40.19	42.08	14	60
Alabama & Mississippi	55	42.07	8.87	1.20	39.68	44.47	18	57
Louisiana	121	42.69	8.14	0.74	41.22	44.15	24	60
Total	1943	40.84	8.85	0.20	40.45	41.24	6	60

Table 4-9. Tukey's post hoc of *HPKS* scores by *States*

	(I) States	(J) States	Mean difference (I-J)	Std. error	Sig.	95% confidence interval Lower bound	Upper bound
Tukey HSD	Georgia	Florida	*-3.51	0.89	0.00	-5.94	-1.09
		Alabama & Mississippi	*-4.75	1.46	0.01	-8.75	-0.76
		Louisiana	*-5.37	1.17	0.00	-8.56	-2.17
		Texas	*-3.81	0.98	0.00	-6.50	-1.13
	Florida	Georgia	*3.51	0.89	0.00	1.09	5.94
		Alabama & Mississippi	-1.24	1.21	0.85	-4.55	2.07
		Louisiana	-1.85	0.84	0.18	-4.13	0.43
		Texas	-0.30	0.54	0.98	-1.78	1.18
	Alabama & Mississippi	Georgia	*4.75	1.46	0.01	0.76	8.75
		Florida	1.24	1.21	0.85	-2.07	4.55
		Louisiana	-0.61	1.43	0.99	-4.52	3.30
		Texas	0.94	1.28	0.95	-2.56	4.44
	Louisiana	Georgia	*5.37	1.17	0.00	2.17	8.56
		Florida	1.85	0.84	0.18	-0.43	4.13
		Alabama & Mississippi	0.61	1.43	0.99	-3.30	4.52
		Texas	1.55	0.94	0.46	-1.00	4.11
	Texas	Georgia	*3.81	0.98	0.00	1.13	6.50
		Florida	0.30	0.54	0.98	-1.18	1.78
		Alabama & Mississippi	-0.94	1.28	0.95	-4.44	2.56
		Louisiana	-1.55	0.94	0.46	-4.11	1.00

* The mean difference is significant at the 0.05 level.

Table 4-10. Descriptive statistics of *HPKS* scores by *Education Levels* (Florida)

	N	Mean	Std. deviation	Std. error	95% confidence interval for mean Lower bound	Upper bound	Minimum	Maximum
HS Diploma or less	211	39.68	9.00	0.62	38.46	40.90	18	60
Some college up to AA/AS Degree	512	40.83	9.11	0.40	40.04	41.63	6	60
Bachelor's Degree	385	41.37	8.50	0.43	40.52	42.22	12	60
Master's Degree	190	40.95	8.33	0.60	39.76	42.14	22	60
Doctoral Degree	34	41.35	9.41	1.61	38.07	44.64	19	60
Total	1332	40.83	8.82	0.24	40.36	41.31	6	60

Table 4-11. ANOVA of *HPKS* scores by *Educational Levels* (Florida)

			Sum of squares	df	Mean square	F	Sig.
Between groups	(Combined)		402.99	4	100.75	1.30	0.270
	Linear term	Unweighted	83.68	1	83.68	1.08	0.300
		Weighted	222.94	1	222.94	2.87	0.091
		Deviation	180.05	3	60.02	0.77	0.510
Within groups			103200.67	1327	77.77		
Total			103603.66	1331			

Table 4-12. Descriptive statistics of *HPKS* scores by *Education Levels*

	N	Mean	Std. deviation	Std. error	95% confidence interval for mean Lower bound	Upper bound	Minimum	Maximum
HS Diploma or less	308	39.75	9.22	0.53	38.71	40.78	12	60
Some college up to AA/AS	730	40.70	9.13	0.34	40.04	41.36	6	60
Bachelor's Degree	567	41.35	8.52	0.36	40.65	42.06	12	60
Master's Degree	282	41.46	8.19	0.49	40.50	42.42	21	60
Doctoral Degree	56	40.50	9.12	1.22	38.06	42.94	18	60
Total	1943	40.84	8.85	0.20	40.45	41.24	6	60

Table 4-13. ANOVA of *HPKS* scores by *Educational Levels*

		Sum of squares	df	Mean square	F	Sig.
Between groups (Combined)		647.99	4	162.00	2.07	0.082
Linear term	Unweighted	57.63	1	57.63	0.74	0.391
	Weighted	420.61	1	420.61	5.38	0.020
	Deviation	227.37	3	75.79	0.97	0.406
Within groups		151407.76	1938	78.13		
Total		152055.75	1942			

Table 4-14. Descriptive statistics of *HPKS* scores by *Household Incomes* (Florida)

					95% confidence interval for mean			
	N	Mean	Std. deviation	Std. error	Lower bound	Upper bound	Minimum	Maximum
Up to $14,999	59	36.37	9.13	1.19	33.99	38.75	21	60
$15,000-$24,999	95	39.53	8.84	0.91	37.73	41.33	19	60
$25,000-$34,999	157	39.57	8.79	0.70	38.18	40.95	19	60
$35,000-$49,999	192	40.59	9.15	0.66	39.29	41.89	9	60
$50,000-$74,999	353	40.60	8.60	0.46	39.70	41.50	18	60
$75,000-$99,999	243	42.64	8.62	0.55	41.55	43.73	17	60
$100,000-$149,999	160	41.58	8.60	0.68	40.24	42.92	6	60
$150,000 or more	73	43.01	8.07	0.94	41.13	44.90	25	60
Total	1332	40.83	8.82	0.24	40.36	41.31	6	60

Table 4-15. Tukey's post hoc of *HPKS* scores by *Household Incomes* (Florida)

	(I) Income	(J) Income	Mean difference (I-J)	Std. error	Sig.	95% confidence interval Lower bound	Upper bound
Tukey HSD	Up to $14,999	$15,000-$24,999	-3.15	1.45	0.364	-7.54	1.24
		$25,000-$34,999	-3.19	1.33	0.243	-7.24	0.85
		$35,000-$49,999	*-4.22	1.30	0.026	-8.16	-0.27
		$50,000-$74,999	*-4.22	1.23	0.014	-7.95	-0.50
		$75,000-$99,999	*-6.27	1.27	0.000	-10.11	-2.43
		$100,000-$149,999	*-5.21	1.33	0.002	-9.24	-1.17
		$150,000 or more	*-6.64	1.53	0.000	-11.28	-2.00
	$15,000-$24,999	Up to $14,999	3.15	1.45	0.364	-1.24	7.54
		$25,000-$34,999	-0.04	1.13	1.000	-3.48	3.40
		$35,000-$49,999	-1.06	1.09	0.978	-4.38	2.26
		$50,000-$74,999	-1.07	1.01	0.964	-4.13	1.99
		$75,000-$99,999	-3.12	1.06	0.064	-6.32	0.09
		$100,000-$149,999	-2.05	1.13	0.607	-5.49	1.38
		$150,000 or more	-3.49	1.36	0.168	-7.61	0.63
	$25,000-$34,999	Up to $14,999	3.19	1.33	0.243	-0.85	7.24
		$15,000-$24,999	0.04	1.13	1.000	-3.40	3.48
		$35,000-$49,999	-1.02	0.94	0.959	-3.87	1.83
		$50,000-$74,999	-1.03	0.84	0.922	-3.57	1.51
		$75,000-$99,999	*-3.08	0.89	0.014	-5.79	-0.36
		$100,000-$149,999	-2.01	0.98	0.445	-4.99	0.96
		$150,000 or more	-3.45	1.24	0.099	-7.20	0.30
	$35,000-$49,999	Up to $14,999	*4.22	1.30	0.026	0.27	8.16
		$15,000-$24,999	1.06	1.09	0.978	-2.26	4.38
		$25,000-$34,999	1.02	0.94	0.959	-1.83	3.87
		$50,000-$74,999	-0.01	0.78	1.000	-2.38	2.37
		$75,000-$99,999	-2.05	0.84	0.224	-4.61	0.50
		$100,000-$149,999	-0.99	0.93	0.964	-3.83	1.84
		$150,000 or more	-2.43	1.20	0.467	-6.07	1.22
	$50,000-$74,999	Up to $14,999	*4.22	1.23	0.014	0.50	7.95
		$15,000-$24,999	1.07	1.01	0.964	-1.99	4.13
		$25,000-$34,999	1.03	0.84	0.922	-1.51	3.57
		$35,000-$49,999	0.01	0.78	1.000	-2.37	2.38
		$75,000-$99,999	-2.04	0.73	0.093	-4.25	0.16
		$100,000-$149,999	-0.98	0.83	0.937	-3.51	1.54
		$150,000 or more	-2.42	1.12	0.381	-5.82	0.99

Table 4-15. Continued

(I) Income	(J) Income	Mean difference (I-J)	Std. error	Sig.	95% confidence interval Lower bound	Upper bound
$75,000-$99,999	Up to $14,999	*6.27	1.27	0.000	2.43	10.11
	$15,000-$24,999	3.12	1.06	0.064	-0.09	6.32
	$25,000-$34,999	*3.08	0.89	0.014	0.36	5.79
	$35,000-$49,999	2.05	0.84	0.224	-0.50	4.61
	$50,000-$74,999	2.04	0.73	0.093	-0.16	4.25
	$100,000-$149,999	1.06	0.89	0.934	-1.64	3.76
	$150,000 or more	-0.37	1.16	1.000	-3.91	3.16
$100,000-$149,999	Up to $14,999	*5.21	1.33	0.002	1.17	9.24
	$15,000-$24,999	2.05	1.13	0.607	-1.38	5.49
	$25,000-$34,999	2.01	0.98	0.445	-0.96	4.99
	$35,000-$49,999	0.99	0.93	0.964	-1.84	3.83
	$50,000-$74,999	0.98	0.83	0.937	-1.54	3.51
	$75,000-$99,999	-1.06	0.89	0.934	-3.76	1.64
	$150,000 or more	-1.43	1.23	0.942	-5.17	2.31
$150,000 or more	Up to $14,999	*6.64	1.53	0.000	2.00	11.28
	$15,000-$24,999	3.49	1.36	0.168	-0.63	7.61
	$25,000-$34,999	3.45	1.24	0.099	-0.30	7.20
	$35,000-$49,999	2.43	1.20	0.467	-1.22	6.07
	$50,000-$74,999	2.42	1.12	0.381	-0.99	5.82
	$75,000-$99,999	0.37	1.16	1.000	-3.16	3.91
	$100,000-$149,999	1.43	1.23	0.942	-2.31	5.17

* The mean difference is significant at the 0.05 level.

Table 4-16. Descriptive statistics of *HPKS* scores by *Household Incomes*

	N	Mean	Std. deviation	Std. error	95% confidence interval for mean Lower bound	Upper bound	Minimum	Maximum
Up to $14,999	82	37.16	9.71	1.07	35.02	39.29	13	60
$15,000-$24,999	137	39.99	8.60	0.74	38.54	41.45	19	60
$25,000-$34,999	219	39.94	9.09	0.61	38.73	41.15	13	60
$35,000-$49,999	264	40.20	8.99	0.55	39.11	41.29	9	60
$50,000-$74,999	496	40.66	8.72	0.39	39.89	41.43	12	60
$75,000-$99,999	355	42.43	8.58	0.46	41.54	43.33	17	60
$100,000-$149,999	260	41.22	8.84	0.55	40.14	42.30	6	60
$150,000 or more	130	42.53	8.03	0.70	41.14	43.92	18	60
Total	1943	40.84	8.85	0.20	40.45	41.24	6	60

Table 4-17. Tukey's post hoc of *HPKS* scores by *Household Incomes*

	(I) Income	(J) Income	Mean difference (I-J)	Std. error	Sig.	95% confidence interval Lower bound	Upper bound
Tukey HSD	Up to $14,999	$15,000-$24,999	-2.83	1.23	0.288	-6.55	0.89
		$25,000-$34,999	-2.78	1.14	0.221	-6.23	0.67
		$35,000-$49,999	-3.04	1.11	0.112	-6.41	0.33
		$50,000-$74,999	*-3.50	1.05	0.019	-6.68	-0.32
		$75,000-$99,999	*-5.27	1.08	0.000	-8.54	-2.01
		$100,000-$149,999	*-4.06	1.11	0.007	-7.44	-0.69
		$150,000 or more	*-5.37	1.24	0.000	-9.13	-1.61
	$15,000-$24,999	Up to $14,999	2.83	1.23	0.288	-0.89	6.55
		$25,000-$34,999	0.06	0.96	1.000	-2.85	2.96
		$35,000-$49,999	-0.20	0.92	1.000	-3.01	2.60
		$50,000-$74,999	-0.67	0.85	0.994	-3.24	1.91
		$75,000-$99,999	-2.44	0.88	0.106	-5.12	0.24
		$100,000-$149,999	-1.23	0.93	0.890	-4.04	1.59
		$150,000 or more	-2.54	1.08	0.262	-5.80	0.72
	$25,000-$34,999	Up to $14,999	2.78	1.14	0.221	-0.67	6.23
		$15,000-$24,999	-0.06	0.96	1.000	-2.96	2.85
		$35,000-$49,999	-0.26	0.80	1.000	-2.70	2.17
		$50,000-$74,999	-0.72	0.71	0.972	-2.89	1.44
		$75,000-$99,999	*-2.49	0.75	0.022	-4.78	-0.21
		$100,000-$149,999	-1.28	0.81	0.755	-3.73	1.16
		$150,000 or more	-2.59	0.97	0.133	-5.54	0.36
	$35,000-$49,999	Up to $14,999	3.04	1.11	0.112	-0.33	6.41
		$15,000-$24,999	0.20	0.92	1.000	-2.60	3.01
		$25,000-$34,999	0.26	0.80	1.000	-2.17	2.70
		$50,000-$74,999	-0.46	0.67	0.997	-2.49	1.57
		$75,000-$99,999	*-2.23	0.71	0.038	-4.40	-0.07
		$100,000-$149,999	-1.02	0.77	0.887	-3.35	1.31
		$150,000 or more	-2.33	0.94	0.204	-5.19	0.52
	$50,000-$74,999	Up to $14,999	*3.50	1.05	0.019	0.32	6.68
		$15,000-$24,999	0.67	0.85	0.994	-1.91	3.24
		$25,000-$34,999	0.72	0.71	0.972	-1.44	2.89
		$35,000-$49,999	0.46	0.67	0.997	-1.57	2.49
		$75,000-$99,999	-1.77	0.61	0.073	-3.62	0.08
		$100,000-$149,999	-0.56	0.67	0.991	-2.60	1.48
		$150,000 or more	-1.87	0.87	0.375	-4.50	0.75

Table 4-17. Continued

(I) Income	(J) Income	Mean difference (I-J)	Std. error	Sig.	95% confidence interval Lower bound	Upper bound
$75,000-$99,999	Up to $14,999	*5.27	1.08	0.000	2.01	8.54
	$15,000-$24,999	2.44	0.88	0.106	-0.24	5.12
	$25,000-$34,999	*2.49	0.75	0.022	0.21	4.78
	$35,000-$49,999	*2.23	0.71	0.038	0.07	4.40
	$50,000-$74,999	1.77	0.61	0.073	-0.08	3.62
	$100,000-$149,999	1.21	0.72	0.694	-0.96	3.39
	$150,000 or more	-0.10	0.90	1.000	-2.83	2.63
$100,000-$149,999	Up to $14,999	*4.06	1.11	0.007	0.69	7.44
	$15,000-$24,999	1.23	0.93	0.890	-1.59	4.04
	$25,000-$34,999	1.28	0.81	0.755	-1.16	3.73
	$35,000-$49,999	1.02	0.77	0.887	-1.31	3.35
	$50,000-$74,999	0.56	0.67	0.991	-1.48	2.60
	$75,000-$99,999	-1.21	0.72	0.694	-3.39	0.96
	$150,000 or more	-1.31	0.94	0.862	-4.17	1.55
$150,000 or more	Up to $14,999	*5.37	1.24	0.000	1.61	9.13
	$15,000-$24,999	2.54	1.08	0.262	-0.72	5.80
	$25,000-$34,999	2.59	0.97	0.133	-0.36	5.54
	$35,000-$49,999	2.33	0.94	0.204	-0.52	5.19
	$50,000-$74,999	1.87	0.87	0.375	-0.75	4.50
	$75,000-$99,999	0.10	0.90	1.000	-2.63	2.83
	$100,000-$149,999	1.31	0.94	0.862	-1.55	4.17

* The mean difference is significant at the 0.05 level.

Table 4-18. Descriptive statistics of *HPKS* scores by homeowners' *Age* (Florida)

	N	Mean	Std. deviation	Std. error	95% confidence interval for mean Lower bound	Upper bound	Minimum	Maximum
25-34 years	162	42.28	9.21	0.72	40.86	43.71	21	60
35-44 years	199	40.64	8.99	0.64	39.39	41.90	19	60
45-54 years	261	40.40	8.97	0.55	39.31	41.50	6	60
55-64 years	372	41.17	8.41	0.44	40.31	42.02	18	60
65-75 years	338	40.22	8.83	0.48	39.28	41.17	9	59
Total	1332	40.83	8.82	0.24	40.36	41.31	6	60

Table 4-19. ANOVA of *HPKS* scores by homeowners' *Age* (Florida)

		Sum of squares	df	Mean square	F	Sig.
Between groups (Combined)		564.27	4	141.07	1.82	0.123
Linear term	Unweighted	293.06	1	293.06	3.77	0.052
	Weighted	220.68	1	220.68	2.84	0.092
	Deviation	343.60	3	114.53	1.48	0.220
Within groups		103039.39	1327	77.65		
Total		103603.66	1331			

Table 4-20. Descriptive statistics of *HPKS* scores by homeowners' *Age*

					95% confidence interval for mean			
	N	Mean	Std. deviation	Std. error	Lower bound	Upper bound	Minimum	Maximum
25-34 years	249	41.82	9.49	0.60	40.63	43.00	12	60
35-44 years	305	40.30	9.09	0.52	39.27	41.32	13	60
45-54 years	403	40.21	8.99	0.45	39.33	41.09	6	60
55-64 years	534	41.51	8.37	0.36	40.79	42.22	18	60
65-75 years	452	40.46	8.68	0.41	39.66	41.26	9	59
Total	1943	40.84	8.85	0.20	40.45	41.24	6	60

Table 4-21. ANOVA of *HPKS* scores by homeowners' *Age*

		Sum of squares	df	Mean square	F	Sig.
Between groups (Combined)		787.39	4	196.85	2.52	0.039
Linear term	Unweighted	74.80	1	74.80	0.96	0.328
	Weighted	27.97	1	27.97	0.36	0.550
	Deviation	759.42	3	253.14	3.24	0.021
Within groups		151268.36	1938	78.05		
Total		152055.75	1942			

Table 4-22. Descriptive statistics of *TSES* scores by *Florida Region*

					95% confidence interval for mean			
	N	Mean	Std. deviation	Std. error	Lower bound	Upper bound	Minimum	Maximum
North Florida	163	31.44	8.08	0.63	30.19	32.69	7	50
West Coast	412	31.90	7.87	0.39	31.14	32.67	5	50
Panhandle	46	32.09	7.88	1.16	29.75	34.43	16	50
East Coast	350	32.99	7.65	0.41	32.19	33.80	5	50
South Florida	305	33.82	7.83	0.45	32.94	34.70	11	50
Northwest	56	34.34	8.58	1.15	32.04	36.64	11	50
Total	1332	32.68	7.90	0.22	32.26	33.10	5	50

Table 4-23. Tukey's post hoc of *TSES* scores by *Florida Regions*

	(I) Florida Region	(J) Florida Region	Mean difference (I-J)	Std. error	Sig.	95% confidence interval Lower bound	Upper bound
Tukey HSD	Northwest	Panhandle	2.25	1.56	0.702	-2.21	6.72
		North Florida	2.90	1.22	0.164	-0.58	6.37
		West Coast	2.44	1.12	0.250	-0.76	5.63
		East Coast	1.35	1.13	0.841	-1.88	4.58
		South Florida	0.52	1.14	0.998	-2.74	3.78
	Panhandle	Northwest	-2.25	1.56	0.702	-6.72	2.21
		North Florida	0.65	1.31	0.996	-3.10	4.39
		West Coast	0.18	1.22	1.000	-3.30	3.67
		East Coast	-0.90	1.23	0.978	-4.42	2.61
		South Florida	-1.73	1.24	0.731	-5.28	1.82
	North Florida	Northwest	-2.90	1.22	0.164	-6.37	0.58
		Panhandle	-0.65	1.31	0.996	-4.39	3.10
		West Coast	-0.46	0.73	0.988	-2.54	1.61
		East Coast	-1.55	0.75	0.299	-3.68	0.58
		South Florida	*-2.38	0.76	0.023	-4.55	-0.20
	West Coast	Northwest	-2.44	1.12	0.250	-5.63	0.76
		Panhandle	-0.18	1.22	1.000	-3.67	3.30
		North Florida	0.46	0.73	0.988	-1.61	2.54
		East Coast	-1.09	0.57	0.399	-2.72	0.54
		South Florida	*-1.92	0.59	0.016	-3.61	-0.22
	East Coast	Northwest	-1.35	1.13	0.841	-4.58	1.88
		Panhandle	0.90	1.23	0.978	-2.61	4.42
		North Florida	1.55	0.75	0.299	-0.58	3.68
		West Coast	1.09	0.57	0.399	-0.54	2.72
		South Florida	-0.83	0.62	0.760	-2.59	0.93
	South Florida	Northwest	-0.52	1.14	0.998	-3.78	2.74
		Panhandle	1.73	1.24	0.731	-1.82	5.28
		North Florida	*2.38	0.76	0.023	0.20	4.55
		West Coast	*1.92	0.59	0.016	0.22	3.61
		East Coast	0.83	0.62	0.760	-0.93	2.59

* The mean difference is significant at the 0.05 level.

Table 4-24. Descriptive statistics of *TSES* scores by *State*

	N	Mean	Std. deviation	Std. error	95% confidence interval for mean Lower bound	95% confidence interval for mean Upper bound	Minimum	Maximum
Georgia	106	29.39	7.97	0.77	27.85	30.92	5	48
Texas	329	31.58	7.79	0.43	30.74	32.43	8	50
Louisiana	121	31.93	7.84	0.71	30.52	33.34	13	50
Florida	1332	32.68	7.90	0.22	32.26	33.10	5	50
Alabama & Mississippi	55	34.00	8.84	1.19	31.61	36.39	10	49
Total	1943	32.31	7.95	0.18	31.95	32.66	5	50

Table 4-25. Tukey's post hoc of *TSES* scores by *State*

	(I) States	(J) States	Mean difference (I-J)	Std. error	Sig.	95% confidence interval Lower bound	95% confidence interval Upper bound
Tukey HSD	Georgia	Florida	*-3.29	0.80	0.000	-5.47	-1.11
		Alabama & Mississippi	*-4.61	1.31	0.004	-8.20	-1.02
		Louisiana	-2.55	1.05	0.110	-5.42	0.33
		Texas	-2.20	0.88	0.094	-4.61	0.21
	Florida	Georgia	*3.29	0.80	0.000	1.11	5.47
		Alabama & Mississippi	-1.32	1.09	0.744	-4.29	1.65
		Louisiana	0.75	0.75	0.858	-1.30	2.80
		Texas	1.10	0.49	0.161	-0.23	2.43
	Alabama & Mississippi	Georgia	*4.61	1.31	0.004	1.02	8.20
		Florida	1.32	1.09	0.744	-1.65	4.29
		Louisiana	2.07	1.29	0.493	-1.45	5.58
		Texas	2.42	1.15	0.221	-0.73	5.56
	Louisiana	Georgia	2.55	1.05	0.110	-0.33	5.42
		Florida	-0.75	0.75	0.858	-2.80	1.30
		Alabama & Mississippi	-2.07	1.29	0.493	-5.58	1.45
		Texas	0.35	0.84	0.994	-1.95	2.65
	Texas	Georgia	2.20	0.88	0.094	-0.21	4.61
		Florida	-1.10	0.49	0.161	-2.43	0.23
		Alabama & Mississippi	-2.42	1.15	0.221	-5.56	0.73
		Louisiana	-0.35	0.84	0.994	-2.65	1.95

* The mean difference is significant at the 0.05 level.

Table 4-26. Descriptive statistics of *TSES* scores by *Education Levels* (Florida)

	N	Mean	Std. deviation	Std. error	95% confidence interval for mean Lower bound	95% confidence interval for mean Upper bound	Minimum	Maximum
HS Diploma or less	211	33.25	7.96	0.55	32.17	34.33	5	50
Some college up to AA/AS	512	32.52	7.91	0.35	31.83	33.21	5	50
Bachelor's Degree	385	33.25	7.75	0.40	32.47	34.02	5	50
Master's Degree	190	31.58	7.86	0.57	30.45	32.70	7	50
Doctoral Degree	34	31.29	8.67	1.49	28.27	34.32	12	50
Total	1332	32.68	7.90	0.22	32.26	33.10	5	50

Table 4-27. ANOVA of *TSES* scores by *Education Levels* (Florida)

			Sum of squares	df	Mean square	F	Sig.
Between groups	(Combined)		501.332	4	125.333	2.015	0.090
	Linear term	Unweighted	163.873	1	163.873	2.635	0.105
		Weighted	159.551	1	159.551	2.566	0.109
		Deviation	341.781	3	113.927	1.832	0.139
Within groups			82522.425	1327	62.187		
Total			83023.757	1331			

Table 4-28. Descriptive statistics of *TSES* scores by *Education Levels*

	N	Mean	Std. deviation	Std. error	95% confidence interval for mean Lower bound	95% confidence interval for mean Upper bound	Minimum	Maximum
HS Diploma or less	308	32.87	8.24	0.47	31.95	33.80	5	50
Some college up to AA/AS	730	32.17	7.96	0.29	31.59	32.75	5	50
Bachelor's Degree	567	32.75	7.65	0.32	32.12	33.38	5	50
Master's Degree	282	31.35	8.16	0.49	30.40	32.31	5	50
Doctoral Degree	56	31.23	7.71	1.03	29.17	33.30	12	50
Total	1943	32.31	7.95	0.18	31.95	32.66	5	50

Table 4-29. ANOVA of *TSES* scores by *Education Levels*

			Sum of squares	df	Mean square	F	Sig.
Between groups	(Combined)		546.59	4	136.65	2.17	0.070
	Linear term	Unweighted	188.42	1	188.42	2.99	0.084
		Weighted	205.26	1	205.26	3.26	0.071
		Deviation	341.33	3	113.78	1.81	0.144
Within groups			122099.82	1938	63.00		
Total			122646.41	1942			

Table 4-30. Descriptive statistics of *TSES* scores by *Household Incomes* (Florida)

	N	Mean	Std. deviation	Std. error	95% confidence interval for mean Lower bound	95% confidence interval for mean Upper bound	Minimum	Maximum
Up to $14,999	59	32.32	9.24	1.20	29.91	34.73	9	50
$15,000-$24,999	95	32.83	7.05	0.72	31.40	34.27	13	50
$25,000-$34,999	157	32.85	7.73	0.62	31.63	34.07	10	50
$35,000-$49,999	192	32.58	8.12	0.59	31.43	33.74	5	50
$50,000-$74,999	353	32.50	7.74	0.41	31.69	33.31	7	50
$75,000-$99,999	243	32.88	8.07	0.52	31.86	33.90	7	50
$100,000-$149,999	160	32.69	7.95	0.63	31.45	33.93	5	50
$150,000 or more	73	32.84	7.91	0.93	30.99	34.68	15	50
Total	1332	32.68	7.90	0.22	32.26	33.10	5	50

Table 4-31. ANOVA of *TSES* scores by *Household Incomes* (Florida)

		Sum of squares	df	Mean square	F	Sig.
Between groups (Combined)		38.39	7	5.48	0.09	0.999
Linear term	Unweighted	4.15	1	4.15	0.07	0.797
	Weighted	2.09	1	2.09	0.03	0.855
	Deviation	36.30	6	6.05	0.10	0.997
Within groups		82985.37	1324	62.68		
Total		83023.76	1331			

Table 4-32. Descriptive statistics of *TSES* scores by *Household Incomes*

	N	Mean	Std. deviation	Std. error	95% confidence interval for mean Lower bound	95% confidence interval for mean Upper bound	Minimum	Maximum
Up to $14,999	82	31.40	9.77	1.08	29.26	33.55	5	50
$15,000-$24,999	137	32.69	7.13	0.61	31.49	33.90	11	50
$25,000-$34,999	219	33.12	8.12	0.55	32.04	34.20	10	50
$35,000-$49,999	264	32.45	7.94	0.49	31.49	33.41	5	50
$50,000-$74,999	496	32.04	7.94	0.36	31.34	32.74	7	50
$75,000-$99,999	355	32.52	7.94	0.42	31.70	33.35	7	50
$100,000-$149,999	260	31.85	7.82	0.48	30.90	32.80	5	50
$150,000 or more	130	32.12	7.58	0.66	30.80	33.43	15	50
Total	1943	32.31	7.95	0.18	31.95	32.66	5	50

Table 4-33. ANOVA of *TSES* scores by *Household Incomes*

			Sum of squares	df	Mean square	F	Sig.
Between groups (Combined)			349.46	7	49.92	0.79	0.596
	Linear term	Unweighted	1.55	1	1.55	0.03	0.876
		Weighted	39.02	1	39.02	0.62	0.432
		Deviation	310.44	6	51.74	0.82	0.555
Within groups			122296.95	1935	63.20		
Total			122646.41	1942			

Table 4-34. Descriptive statistics of *TSES* scores by homeowners' *Age* (Florida)

					95% confidence interval for mean			
	N	Mean	Std. deviation	Std. error	Lower bound	Upper bound	Minimum	Maximum
25-34 years	162	34.70	8.66	0.68	33.35	36.04	7	50
35-44 years	199	33.76	7.44	0.53	32.72	34.80	15	50
45-54 years	261	31.38	8.44	0.52	30.35	32.40	5	50
55-64 years	372	32.96	7.48	0.39	32.20	33.72	11	50
65-75 years	338	31.77	7.52	0.41	30.97	32.58	9	50
Total	1332	32.68	7.90	0.22	32.26	33.10	5	50

Table 4-35. Tukey's post hoc of *TSES* scores by homeowners' *Age* (Florida)

	(I) Age	(J) Age	Mean difference (I-J)	Std. error	Sig.	95% confidence interval Lower bound	95% confidence interval Upper bound
Tukey HSD	25-34 years	35-44 years	0.93	0.83	0.792	-1.33	3.20
		45-54 years	*3.32	0.78	0.000	1.18	5.46
		55-64 years	1.74	0.74	0.129	-0.28	3.75
		65-75 years	*2.93	0.75	0.001	0.88	4.97
	35-44 years	25-34 years	-0.93	0.83	0.792	-3.20	1.33
		45-54 years	*2.39	0.74	0.011	0.38	4.40
		55-64 years	0.80	0.69	0.771	-1.08	2.68
		65-75 years	*1.99	0.70	0.036	0.08	3.90
	45-54 years	25-34 years	*-3.32	0.78	0.000	-5.46	-1.18
		35-44 years	*-2.39	0.74	0.011	-4.40	-0.38
		55-64 years	-1.59	0.63	0.089	-3.31	0.14
		65-75 years	-0.40	0.65	0.973	-2.16	1.37
	55-64 years	25-34 years	-1.74	0.74	0.129	-3.75	0.28
		35-44 years	-0.80	0.69	0.771	-2.68	1.08
		45-54 years	1.59	0.63	0.089	-0.14	3.31
		65-75 years	1.19	0.59	0.256	-0.42	2.80
	65-75 years	25-34 years	*-2.93	0.75	0.001	-4.97	-0.88
		35-44 years	*-1.99	0.70	0.036	-3.90	-0.08
		45-54 years	0.40	0.65	0.973	-1.37	2.16
		55-64 years	-1.19	0.59	0.256	-2.80	0.42

* The mean difference is significant at the 0.05 level.

Table 4-36. Descriptive statistics of *TSES* scores by homeowners' *Age*

	N	Mean	Std. deviation	Std. error	95% confidence interval for mean Lower bound	95% confidence interval for mean Upper bound	Minimum	Maximum
25-34 years	249	34.00	8.66	0.55	32.91	35.08	7	50
35-44 years	305	33.20	7.62	0.44	32.34	34.06	13	50
45-54 years	403	30.86	8.39	0.42	30.04	31.68	5	50
55-64 years	534	32.66	7.59	0.33	32.01	33.30	5	50
65-75 years	452	31.65	7.49	0.35	30.96	32.34	5	50
Total	1943	32.31	7.95	0.18	31.95	32.66	5	50

Table 4-37. Games-Howell post hoc of *TSES* scores by homeowners' *Age*

	(I) Age	(J) Age	Mean difference (I-J)	Std. error	Sig.	95% confidence interval Lower bound	Upper bound
Games-Howell	25-34 years	35-44 years	0.80	0.70	0.785	-1.12	2.72
		45-54 years	*3.14	0.69	0.000	1.25	5.03
		55-64 years	1.34	0.64	0.224	-0.41	3.09
		65-75 years	*2.35	0.65	0.003	0.56	4.13
	35-44 years	25-34 years	-0.80	0.70	0.785	-2.72	1.12
		45-54 years	*2.34	0.60	0.001	0.69	3.99
		55-64 years	0.54	0.55	0.859	-0.95	2.04
		65-75 years	*1.55	0.56	0.047	0.01	3.08
	45-54 years	25-34 years	*-3.14	0.69	0.000	-5.03	-1.25
		35-44 years	*-2.34	0.60	0.001	-3.99	-0.69
		55-64 years	*-1.80	0.53	0.007	-3.25	-0.34
		65-75 years	-0.79	0.55	0.596	-2.29	0.70
	55-64 years	25-34 years	-1.34	0.64	0.224	-3.09	0.41
		35-44 years	-0.54	0.55	0.859	-2.04	0.95
		45-54 years	*1.80	0.53	0.007	0.34	3.25
		65-75 years	1.00	0.48	0.227	-0.31	2.32
	65-75 years	25-34 years	*-2.35	0.65	0.003	-4.13	-0.56
		35-44 years	*-1.55	0.56	0.047	-3.08	-0.01
		45-54 years	0.79	0.55	0.596	-0.70	2.29
		55-64 years	-1.00	0.48	0.227	-2.32	0.31

* The mean difference is significant at the 0.05 level.

Table 4-38. Correlations of *HPKS* and *Demographic Characteristics*

		HPKS	Florida Region	Education	Income	Age
Pearson correlation	HPKS	1.00				
	Florida Region	0.18	1.00			
	Education	0.04	0.08	1.00		
	Income	0.15	0.04	0.37	1.00	
	Age	-0.05	-0.07	-0.07	-0.11	1.00

Table 4-39. Model summary of *HPKS* model 1 (Florida)

Model	R	R^2	Adjusted R^2	Std. error of the estimate	Durbin-Watson
1	0.229a	0.052	0.051	8.59519	2.028

a Predictors: (Constant), Florida Regions, Income

Table 4-40. Regression coefficients of *HPKS* model 1 (Florida)

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	Upper Bound	Collinearity Statistics Tol.	VIF
1	(Constant)	35.12	0.76		46.08	0.000	33.63	36.61		
	FL_Region	1.029	0.16	0.176	6.58	0.000	0.72	1.34	0.998	1.002
	Income	0.697	0.13	0.139	5.19	0.000	0.43	0.96	0.998	1.002

Table 4-41. Model summary of *HPKS* model 2

Model	R	R^2	Adjusted R^2	Std. error of the estimate	Durbin-Watson
2	.140a	0.02	0.019	8.7659	1.918

a Predictors: (Constant), Income, States

Table 4-42. Regression coefficients of *HPKS* model 2

Model		Unstandardized coefficients B	Std. error	Standardized coefficients Beta	t	Sig.	95.0% confidence interval for B Lower bound	Upper bound	Collinearity statistics Tol.	VIF
2	(Constant)	37.036	0.65		57.24	0.000	35.77	38.31		
	Income	0.553	0.11	0.112	4.97	0.000	0.34	0.77	0.998	1.002
	States	0.806	0.23	0.080	3.55	0.000	0.36	1.25	0.998	1.002

Table 4-43. Model summary of *TSES* model 1 (Florida)

Model	R	R^2	Adjusted R^2	Std. error of the estimate	Durbin-Watson
1	.155a	0.024	0.022	7.81131	2.045

a Predictors: (Constant), Florida Region, Age, Education

Table 4-44. Regression coefficients of *TSES* model 1 (Florida)

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	Upper Bound	Collinearity Statistics Tol.	VIF
1	(Constant)	34.36	0.89		38.78	.000	32.63	36.10		
	Florida Region	0.58	0.14	0.11	4.07	.000	0.30	0.86	0.990	1.010
	Age	-0.54	0.16	-0.092	-3.368	.001	-0.859	-0.227	0.994	1.006
	Education	-0.42	0.21	-0.054	-1.977	.048	-0.843	-0.003	0.995	1.005

Table 4-45. Model summary of *TSES* model 2

Model	R	R^2	Adjusted R^2	Std. error of the estimate	Durbin-Watson
2	.127a	0.016	0.015	7.88698	2.018

a Predictors: (Constant), States, Age

Table 4-46. Regression coefficients of *TSES* model 2

		Unstandardized coefficients		Standardized coefficients			95.0% confidence interval for B		Collinearity statistics	
Model		B	Std. error	Beta	t	Sig	Lower bound	Upper bound	Tol.	VIF
2	(Constant)	32.23	0.749		43.05	0.000	30.76	33.70		
	States	.83	0.182	0.103	4.57	0.000	0.47	1.19	1.00	1.00
	Age	-.46	0.135	-0.076	-3.38	0.001	-0.72	-0.19	1.00	1.00

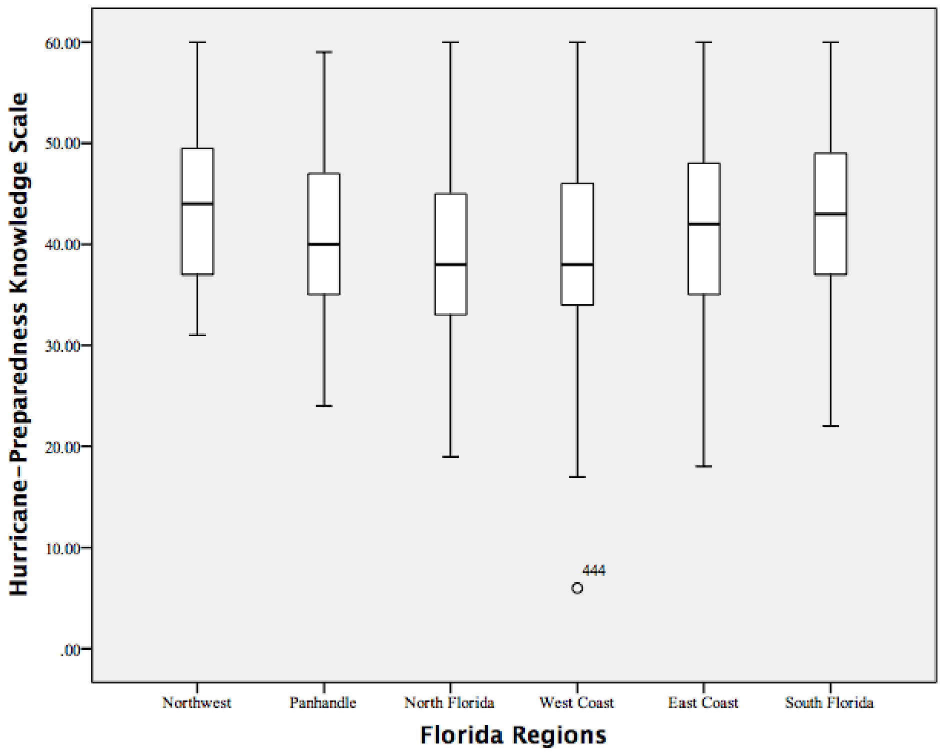

Figure 4-1. Boxplots of *HPKS* scores by *Florida Regions*

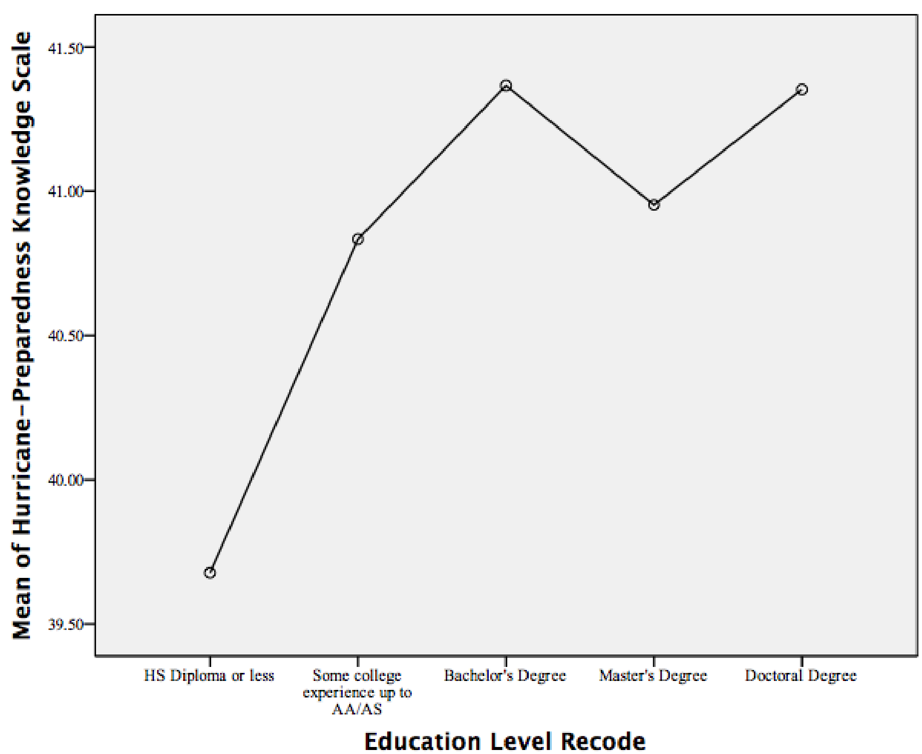

Figure 4-2. Means of *HPKS* scores by *Education Levels* (Florida)

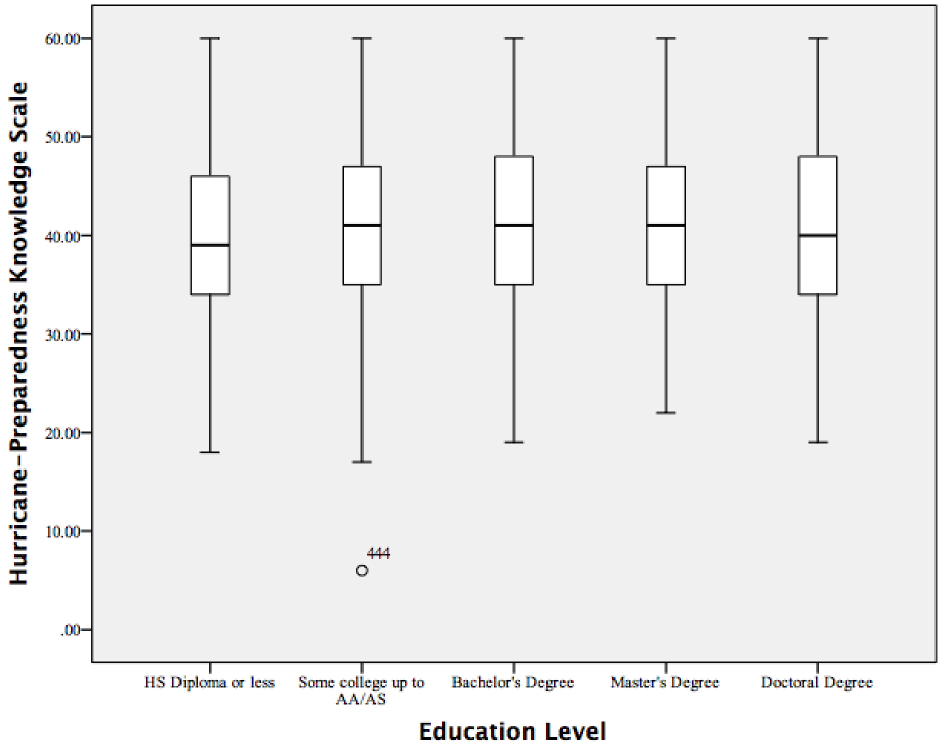

Figure 4-3. Boxplots of *HPKS* scores by *Education Levels* (Florida)

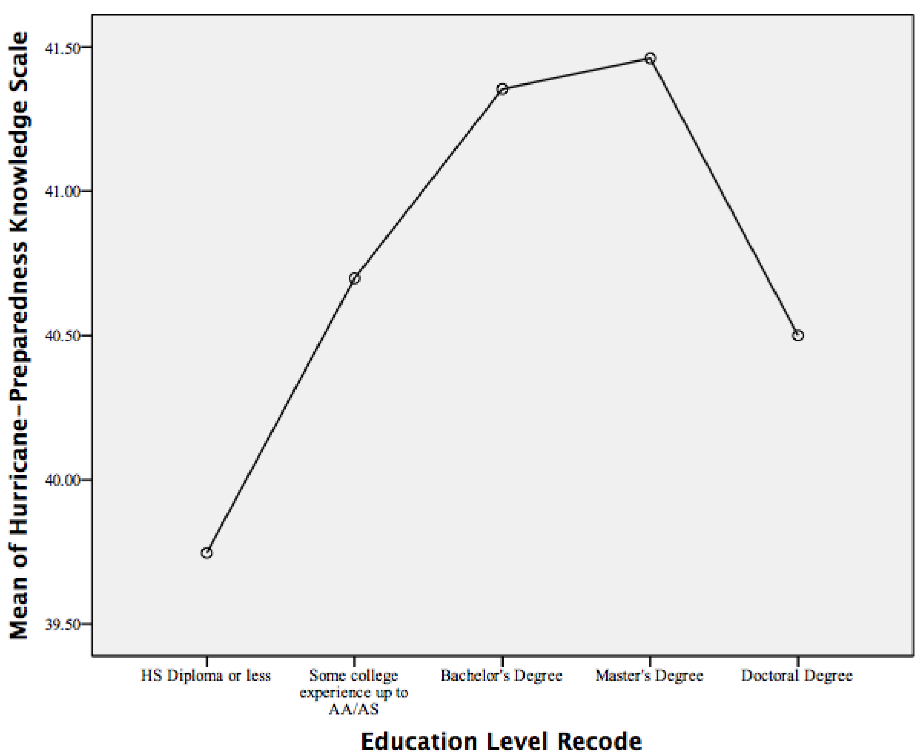

Figure 4-4. Means of *HPKS* scores by *Education Levels*

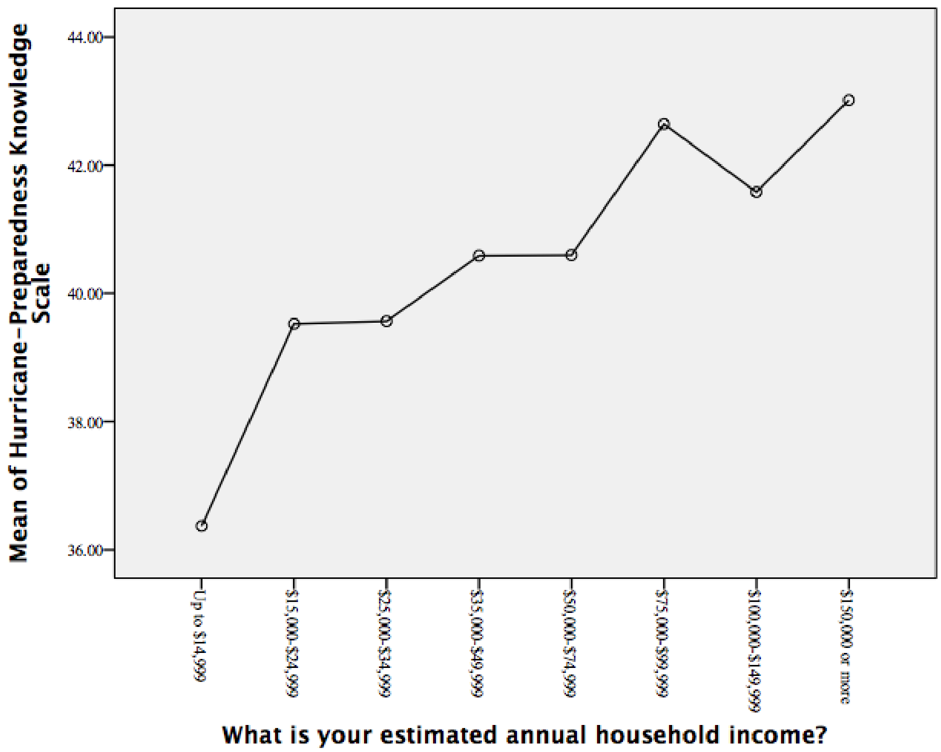

Figure 4-5. Means of *HPKS* scores by *Household Incomes* (Florida)

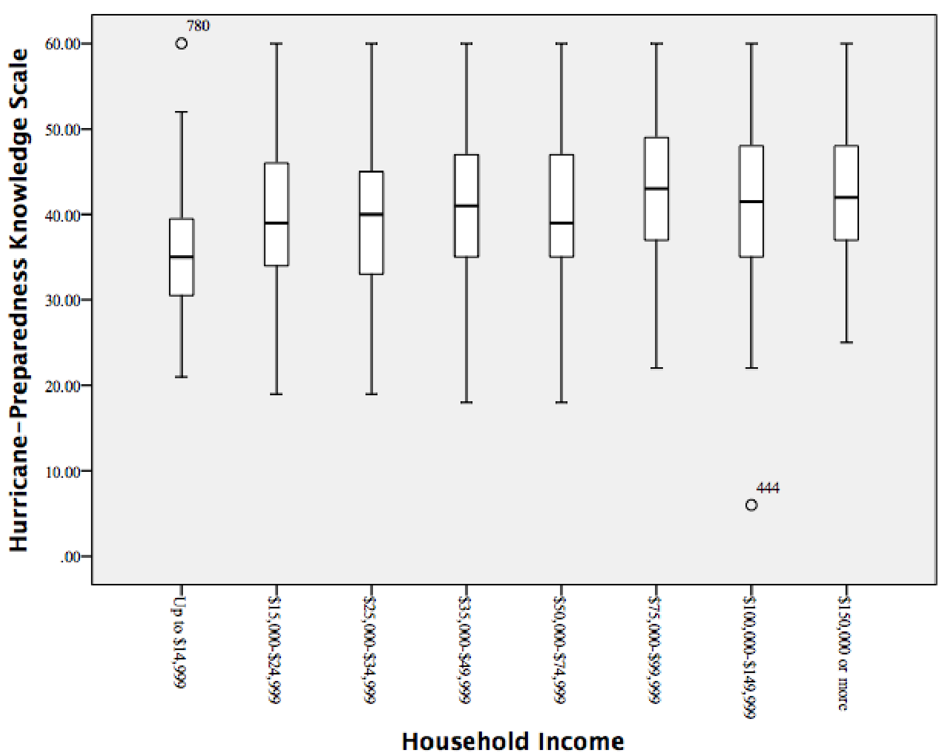

Figure 4-6. Boxplots of *HPKS* scores by *Household Incomes* (Florida)

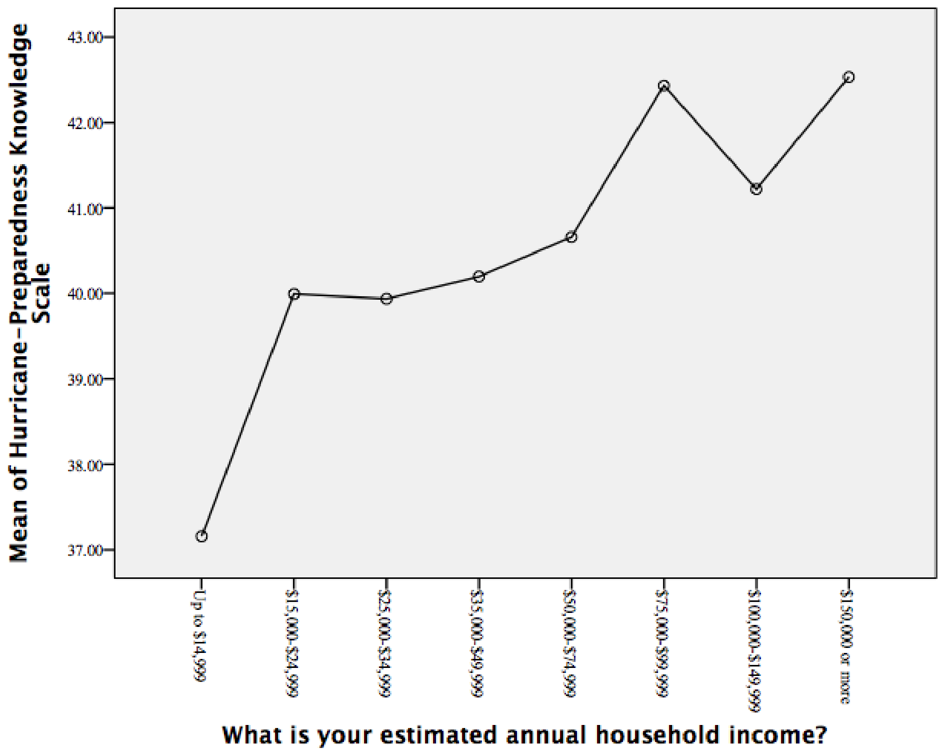

Figure 4-7. Means of *HPKS* scores by *Household Incomes*

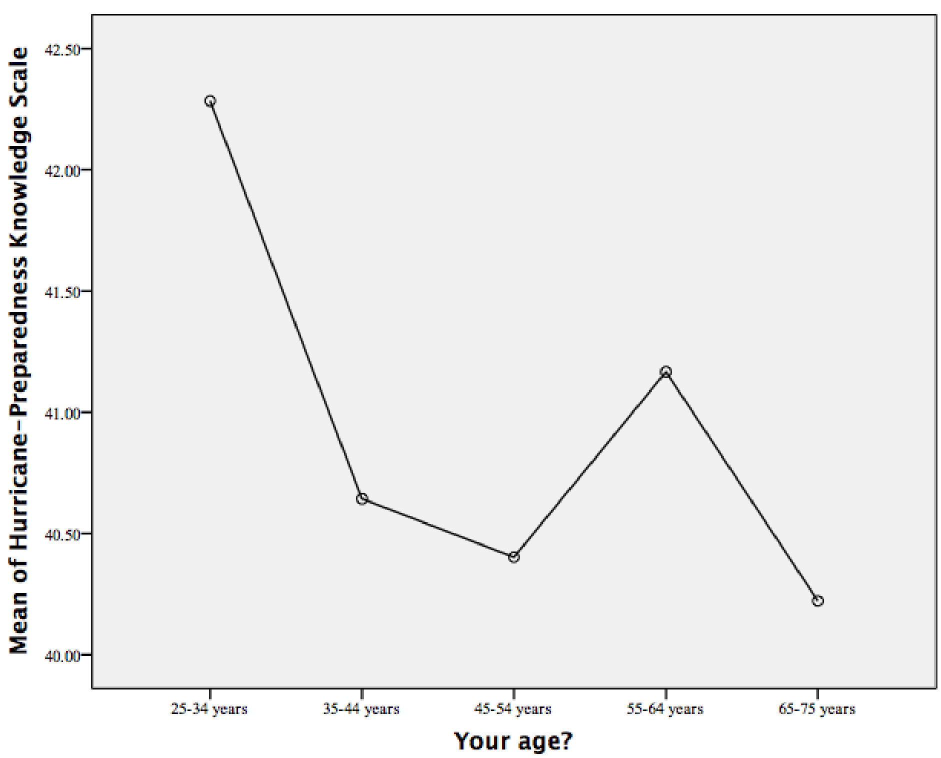

Figure 4-8. Means of *HPKS* scores by homeowners' *Age* (Florida)

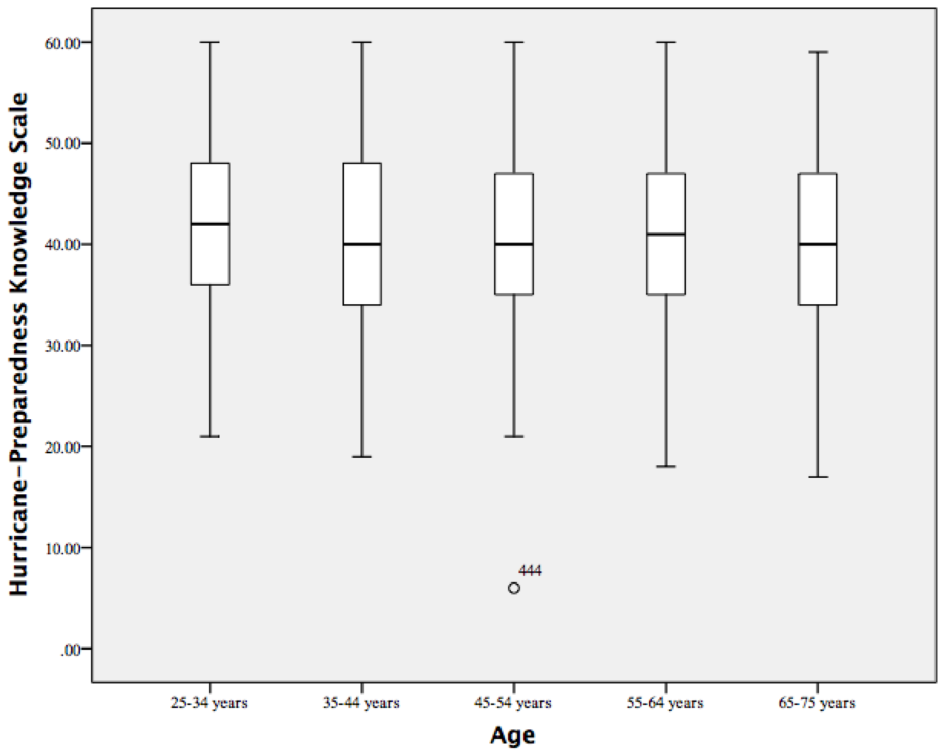

Figure 4-9. Boxplots of *HPKS* scores by homeowners' *Age* (Florida)

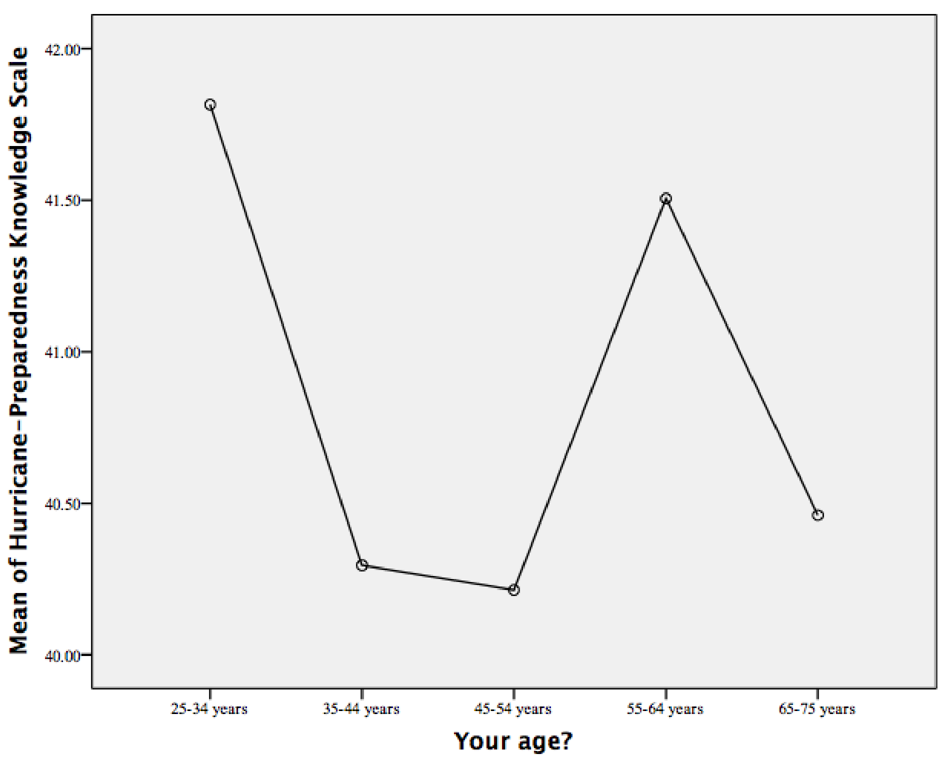

Figure 4-10. Means of *HPKS* scores by homeowners' *Age*

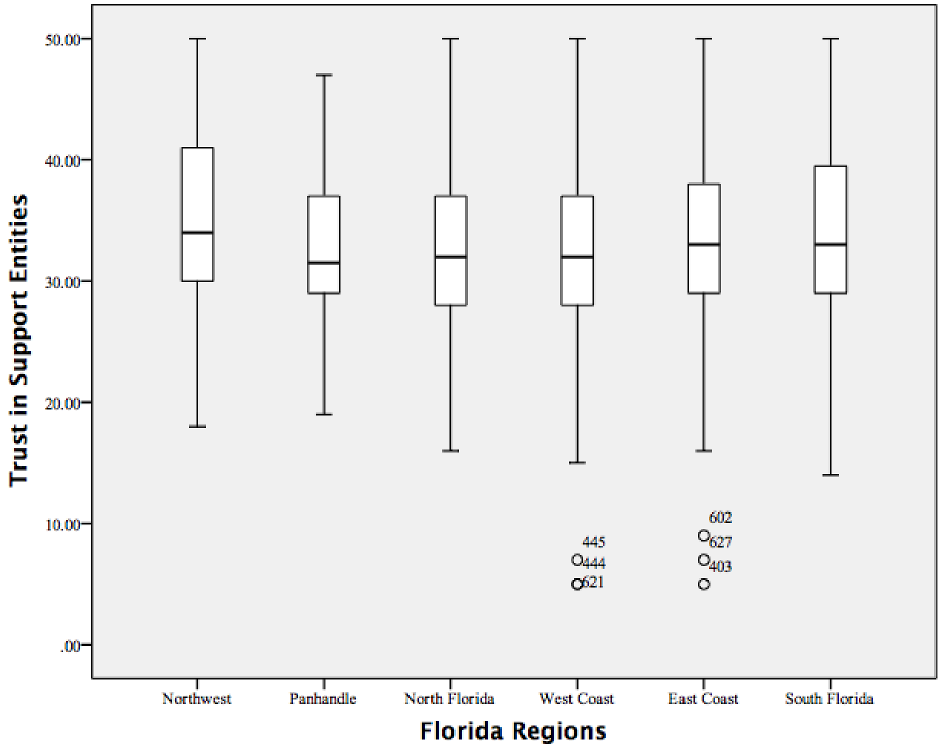

Figure 4-11. Boxplots of *TSES* scores by *Florida Regions*

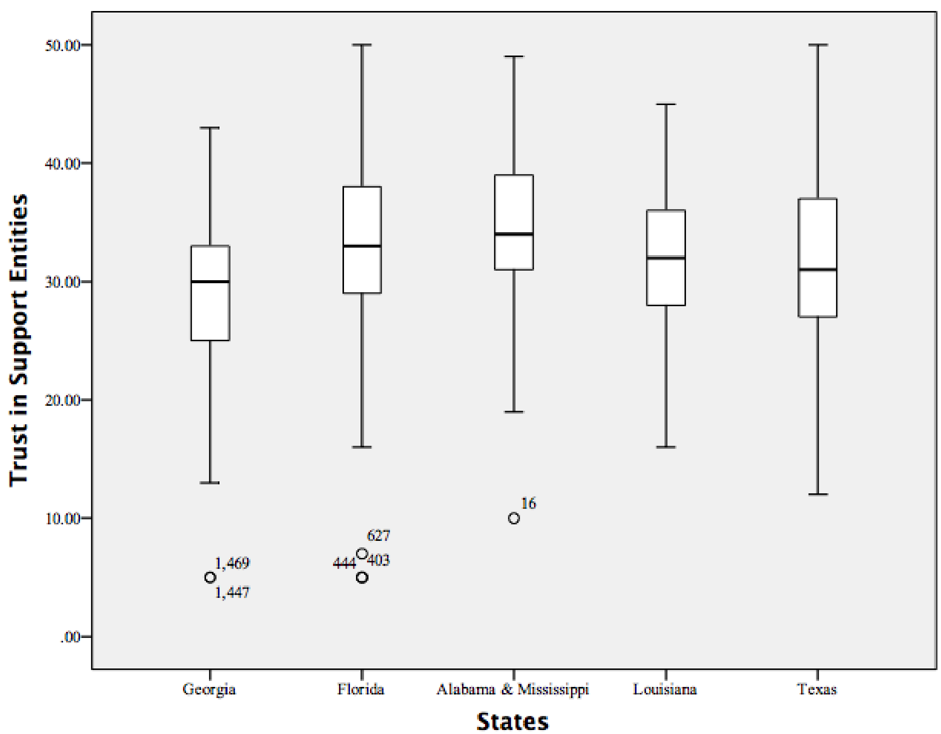

Figure 4-12. Boxplots of *TSES* scores by *State*

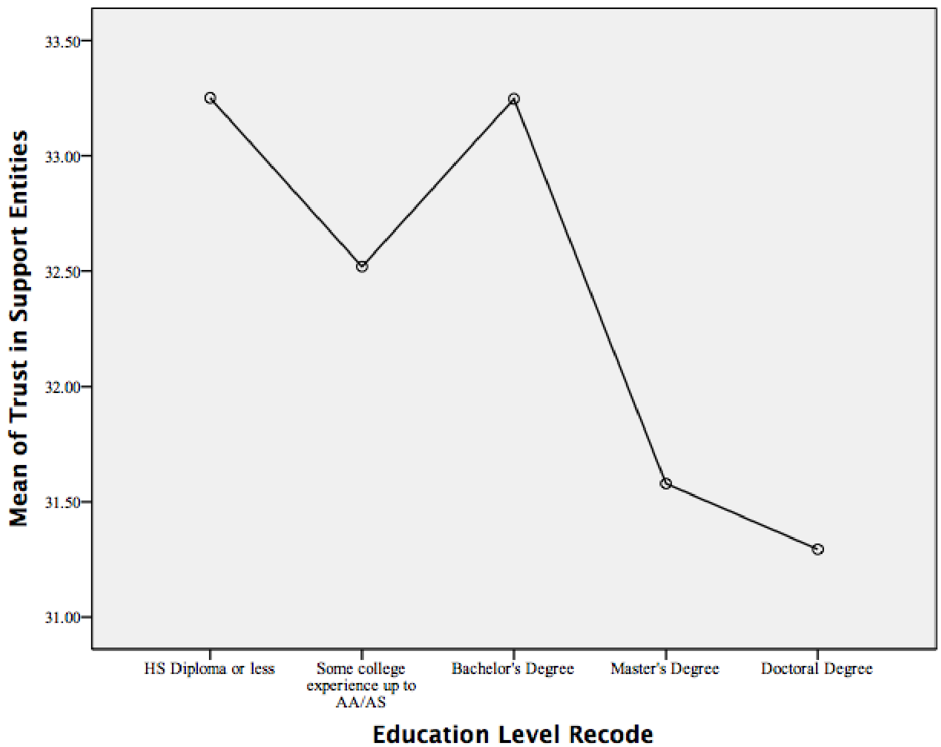

Figure 4-13. Means of *TSES* scores by *Education Levels* (Florida)

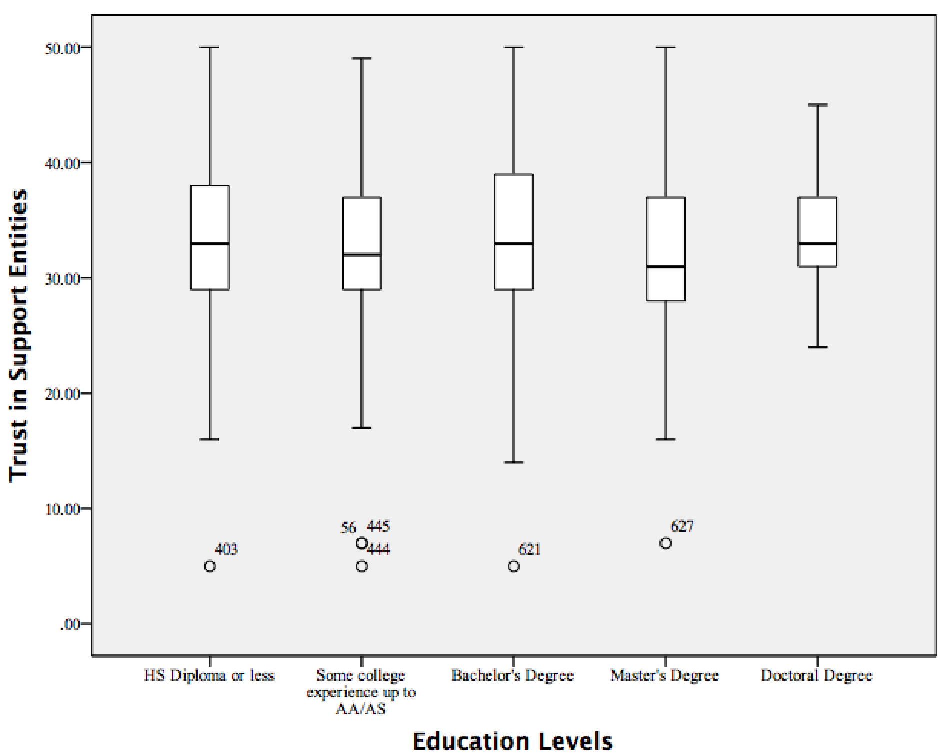

Figure 4-14. Boxplots of *TSES* scores by *Education Levels* (Florida)

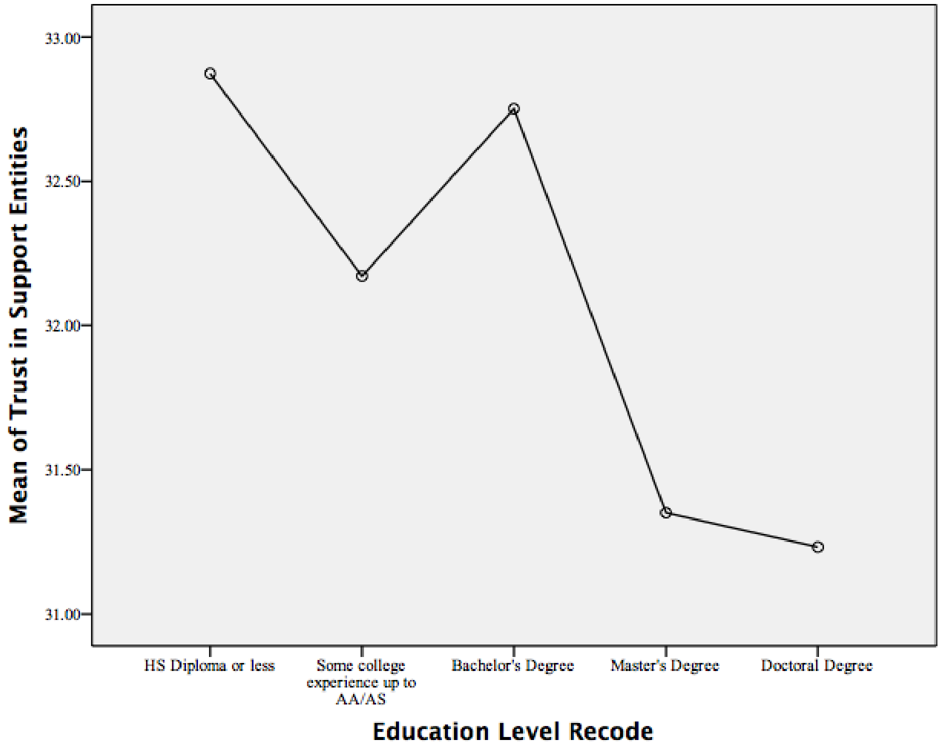

Figure 4-15. Means of *TSES* scores by *Education Levels*

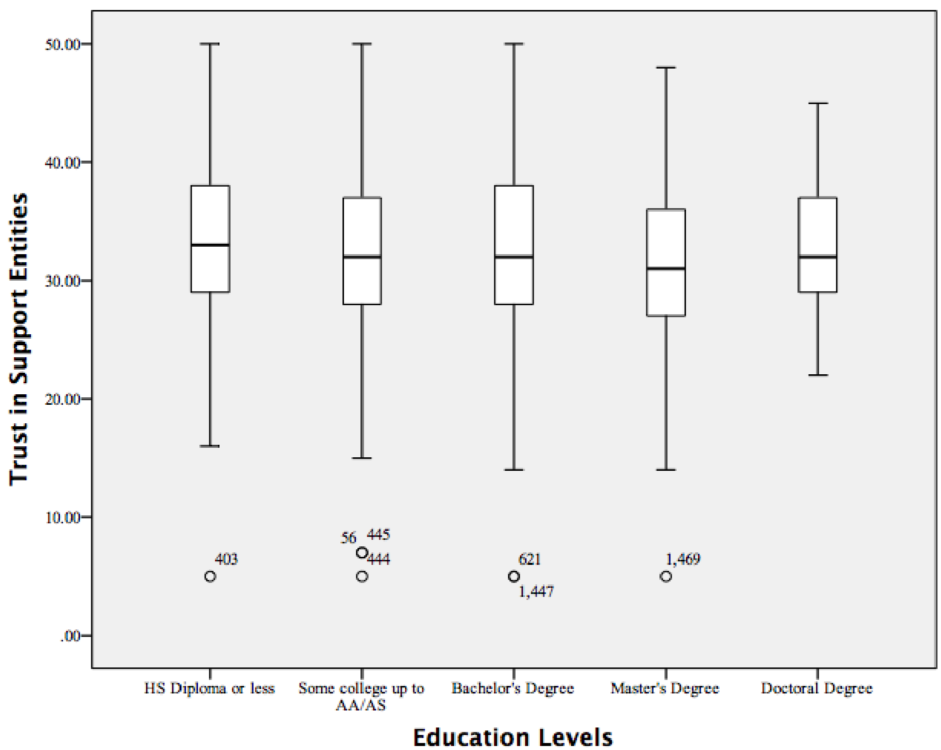

Figure 4-16. Boxplots of *TSES* scores by *Education Levels*

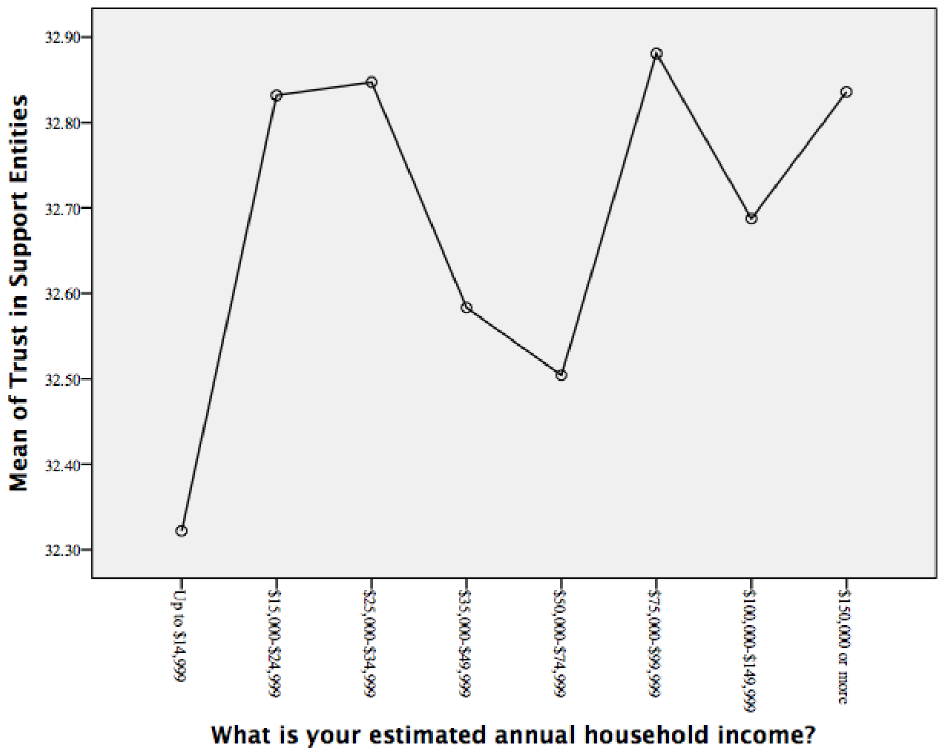

Figure 4-17. Means of *TSES* scores by *Household Incomes* (Florida)

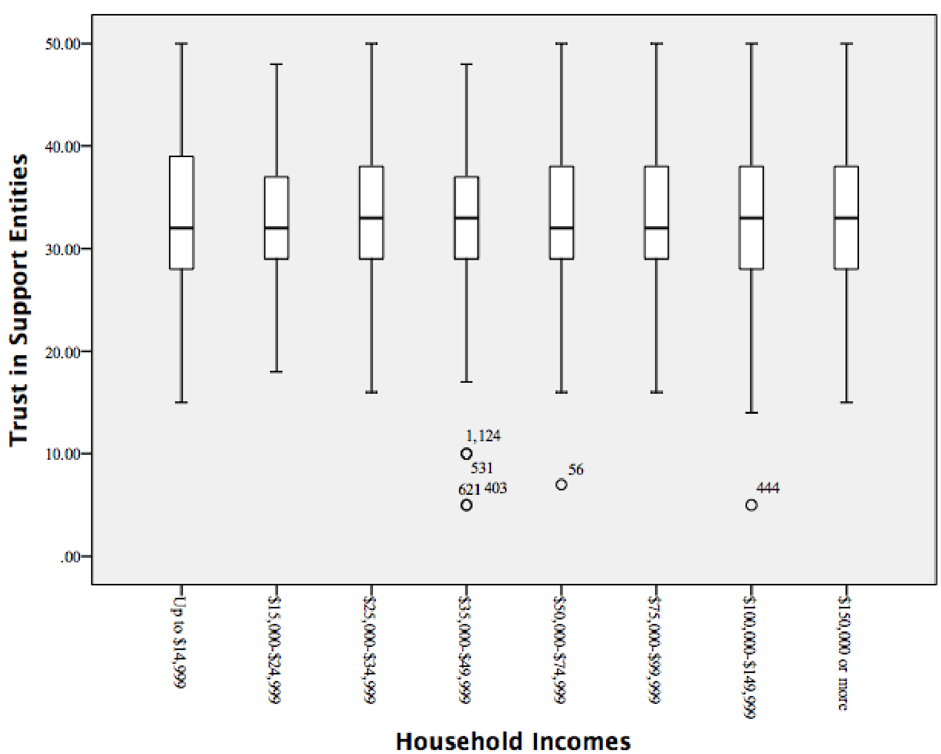

Figure 4-18. Boxplots of *TSES* scores by *Household Incomes* (Florida)

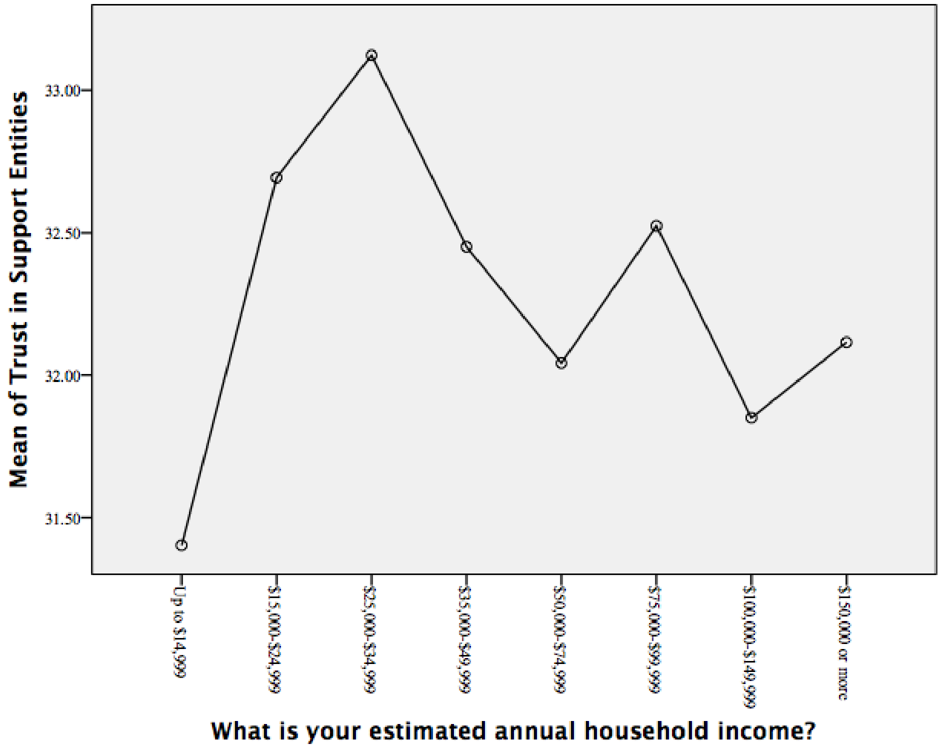

Figure 4-19. Means of *TSES* scores by *Household Incomes*

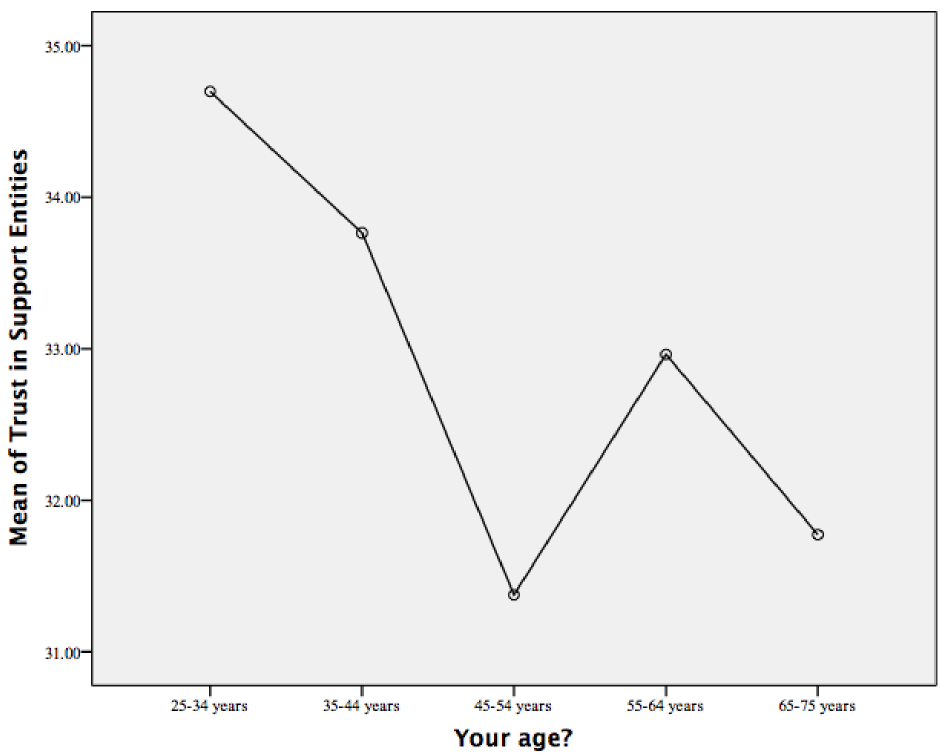

Figure 4-20. Means of *TSES* scores by homeowners' *Age* (Florida)

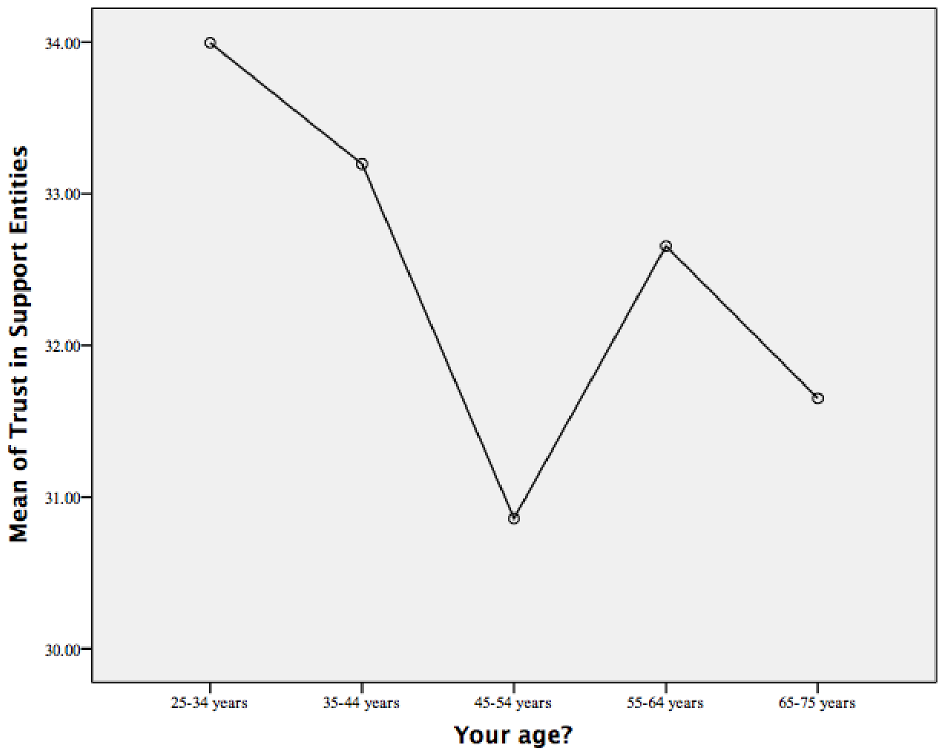

Figure 4-21. Means of *TSES* scores by homeowners' *Age*

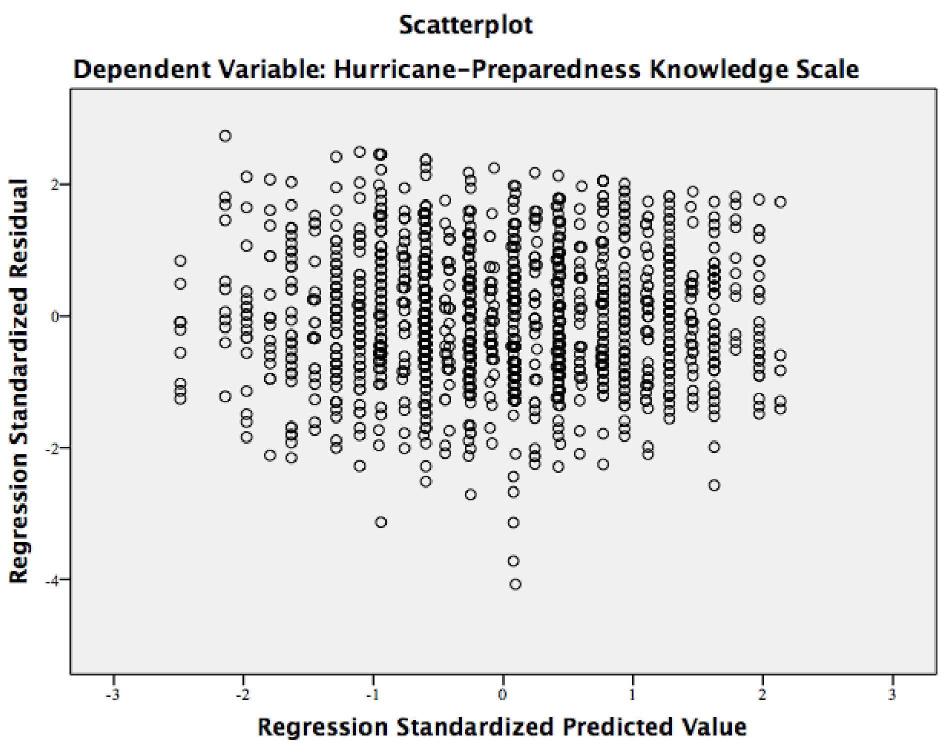

Figure 4-22. Scatterplot of studentized residuals by standardized predicted values

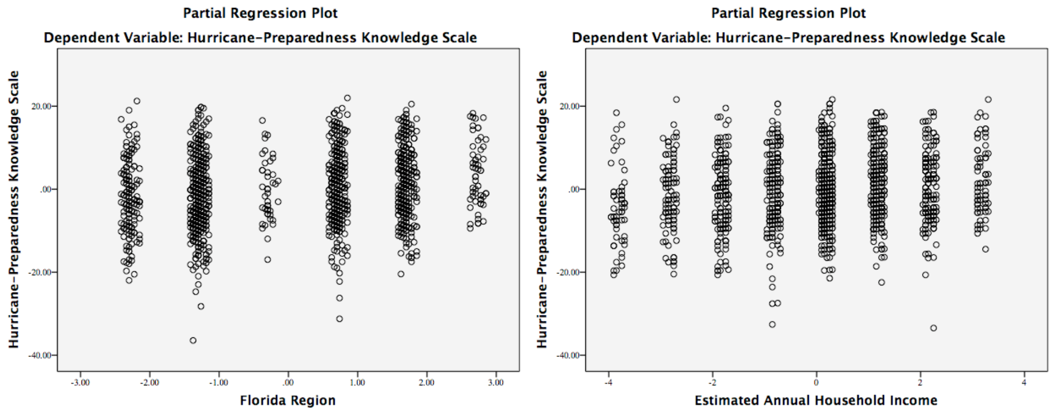

Figure 4-23. Partial regression plots of *HPKS* versus *Demographic Characteristics*

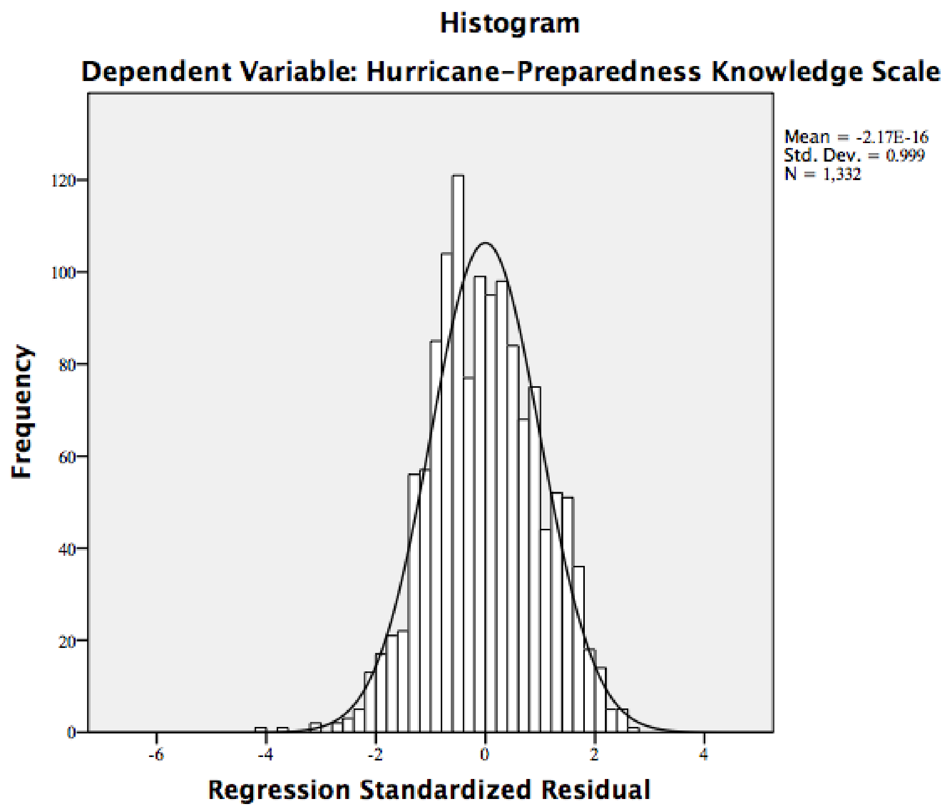

Figure 4-24. Histogram of *HPKS* score frequency versus regression standardized residual

CHAPTER 5
DISCUSSION

Overview

This chapter begins by exploring the results of the prior chapter's analyses as they support or do not support the hypotheses that were developed out of the literature review. Then the discussion moves to possible insights that may have been illuminated by the analyses, demonstrating results that were aligned with the expectations or contradicted. Possible explanations for these results will be then be discussed followed by possible implications that may affect how hurricane-preparedness information is disseminated, future research, and government policy. Finally, any additional limitations that may have emerged during the analyses are addressed, and the thesis proper, ends with the Conclusions section.

Hypotheses Implications

The layout of this section is the same as the Exploring Differences Between Groups section of the previous chapter. The first eight hypotheses all focus on differences in the mean HPKS scores grouped by the demographic characteristics (*location, education, income*, and *age*). The second eight hypotheses all focus on the differences in the mean TSES scores grouped by the same demographic characteristics.

Research Question 1: Hurricane-Preparedness Knowledge

To recap, this study's first research question sought to quantify to what extent demographic characteristics (*location, education, income*, and *age*) could predict homeowners' self-reported score on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)*. The effect of each of these demographic characteristics will first be explored within the state of Florida, then once again across the study area. After this study's hypotheses are addressed, there will be a brief discussion of the findings of the analysis and possible explanations of these findings.

Location of home

$H1_{A1}$: Homeowners located in the counties of Florida's *Panhandle* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other regions within the state.

Despite the existence of statistically significant differences of mean *HPKS* scores between Florida *Regions* ($p < .001$), there existed no differences between Florida's *Panhandle* and other regions. Therefore, there is not support for the hypothesis that homeowners in Florida's *Panhandle* would report lower *HPKS* scores than other *Regions* within the state.

The existence of relaxed building codes in the *panhandle* of Florida contributed to the assumption that hurricanes were not taken as seriously as in other regions of Florida. This hypothesis of lower *HPKS* scores in the panhandle was thought to possibly be a supporting reason for the relaxed wind-speed building codes, with the economic burden of local builders being the primary motivation (Peacock et al., 2005). Another basis for the hypothesis was the predicted vulnerability of landfall locations based on past hurricanes. Figure 5-1 depicts the predicted frequency of hurricanes across the study area. The *Panhandle*, *West coast*, and *North Florida* areas all exhibited lower risk due to reduced frequency of hurricane strikes.

The analysis shows that although this hypothesis was not supported, the inclusion of the hurricane return period in the process was warranted. This study's analysis indicated that homeowners in *North Florida* (n = 163, M = 38.96, SD = 8.71) and the *West Coast* of Florida (n = 412, M = 39.22, SD = 8.94) reported significantly lower mean HPKS scores than the homeowners in the *East Coast* (n = 350, M = 41.47, SD = 8.80), *South Florida* (n = 305, M = 42.71, SD = 8.47), and *Northwest Florida* (n = 56, M = 44.25, SD = 8.82). Initially, the findings that homeowners in the *East Coast* and *South Florida* possessed a higher hurricane preparedness knowledge was more easily understood than those in *Northwest Florida*.

After a deeper review of the literature about hurricanes and the *Northwest* area of Florida, this was slightly better understood. Solis, Thomas, and Letson (2010) explored variables that could contribute to the decision for homeowners to evacuate or "hunker down" during hurricanes. They compared homeowners in the Northwest Panhandle to those living in the Southeast Peninsula of Florida who had experienced the Atlantic Hurricane Season of 2005. Solis, Thomas, and Letson (2010) found that these regional differences were significant and that homeowners in the Northwest Panhandle were more likely to evacuate when ordered. This finding might crossover to an increased knowledge of hurricane-preparedness and warrants further exploration.

For this study, the *Northwest* Florida region only consisted of Escambia, Santa Rosa, and Okaloosa counties and slightly more than four percent of the Floridian responses. Further exploration of this *region* could justifiably be an area of future interest to further the understanding of these recent results.

$H1_{A2}$: Homeowners located in *Georgia* will self-report <u>lower</u> scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other *States* within the study area.

There existed statistically significant differences of mean *HPKS* scores between *States* (p < .001). The mean *HPKS* score of homeowners in the state of *Georgia* was significantly lower than the other five states; therefore, the hypothesis of lower *HPKS* scores in *Georgia* was supported. Referring back to Figure 5-1, it is readily seen that this area of Southeastern *Georgia* is the least threatened coast of the entire study area. The study area also stretched inland the furthest in *Georgia* in order to collect a larger sample. It stands to reason that perceived hurricane risk would decrease as the distance from the coast increases. The connection of perceived risk to motivation of increased knowledge has been made by the Protection Motivation Theory (Rogers, 1975); therefore, this further supported the hypothesis of lower *HPKS* scores due to decreased hurricane risk to homeowners in the *Georgia* sample.

Highest education level of homeowner

$H1_{B1}$: Florida homeowners attaining *less than a bachelor's degree* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners within the state.

There were no statistically significant differences of Floridian homeowners' mean *HPKS* scores between the different levels of *Education* (p = .270). Therefore the hypothesis of Floridian homeowners attaining *less than a Bachelor's Degree* reporting lower *HPKS* scores than other Floridian homeowners was not supported.

$H1_{B2}$: Homeowners from across the study area attaining *less than a bachelor's degree* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners.

There were no statistically significant differences of homeowners' mean *HPKS* scores between the different levels of *Education* (p = .082). Therefore the hypothesis of homeowners attaining *less than a Bachelor's Degree* reporting lower *HPKS* scores than other homeowners was not supported.

The lack of significant differences between *education* levels was surprising. This hypothesis was based on other studies linking *educational attainment* to higher motivation to seek knowledge in different areas, and more specifically to aspects of hurricane and hazard knowledge. Tierney, Lindell, and Perry (2001) listed *education* level as a “relatively consistent predictor of preparedness.” However, during the review of literature, there were several studies in which *education* was not a significant factor as well. This may indicate that the lack of *education* being a significant factor in previous studies’ measures of risk perception (Donahue et al., 2014) and optimistic bias (Trumbo et al., 2014) shared similarities to this study’s HPKS measure. In turn, this also suggested that studies where *education* was a factor, which measured areas such as perceived hazard knowledge (Ge et al., 2011) or even other measures of hurricane-preparedness knowledge (Baker, 2011), were dissimilar from this study’s *HPKS* measure.

Household income

$H1_{C1}$: Florida homeowners with *lower levels of household income* will self-report lower scores on this study’s *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners within the state.

There existed statistically significant differences of Floridian homeowners’ mean *HPKS* scores between levels of *Household Income* ($p < .001$). The mean *HPKS* score of Floridian households claiming *Up to $14,999* was significantly lower than the five highest Floridian household income levels of *$35,000 or more*; therefore, the hypothesis of lower *HPKS* scores being reported by *lower Incomes* was supported.

$H1_{C2}$: Homeowners from across the study area with *lower levels of household income* will self-report lower scores on this study’s *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners.

There existed statistically significant differences of homeowners’ mean *HPKS* scores between levels of *Household Income* ($p < .001$). The mean *HPKS* score of households claiming *Up to $14,999* was significantly lower than the four highest household income levels of *$50,000 or more*; therefore, the hypothesis of lower *HPKS* scores being reported by *lower Incomes* was supported.

This study considered increased *income* as a mitigating factor in the amount of damage from hurricanes. This was based on the premise that homeowners with increased availability to financial resources would have better access to products and home features that could potentially lessen damage caused by hurricanes to their property. *Hurricane-preparedness knowledge* was thought of in a similar manner: homeowners with increased *knowledge* could mitigate some damages incurred from hurricanes.

This rationale was supported by previous studies as researchers found that higher levels of *household income* was a contributing factor to lowered social vulnerability and increased community resilience (Bergstrand et al., 2015), increased household hurricane-preparedness (Baker, 2011), and increased hurricane risk perception (Trumbo et al., 2014).

This current study found a strong trend of increasing *HPKS* scores with increasing *household incomes* within both the Florida sample and the study area as a whole (Figure 5-2). The Florida sample indicated the lowest income level of *Up to $14,999* was significantly different from the top-five income levels beginning at *$35,000*. The entire study area sample indicated significant differences between the lowest income level of *Up to $14,999* beginning at *$50,000* and continuing through the highest levels (Figure 5-2).

Age of homeowner

$H1_{D1}$: Florida homeowners who are *younger* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners within the state.

There were no statistically significant differences of Floridian homeowners' mean *HPKS* scores between the different levels of *Age* (p = .123). Therefore the hypothesis of Floridian homeowners who are *Younger* reporting lower *HPKS* scores than other Floridian homeowners was not supported.

$H1_{D2}$: Homeowners from across the study area who are *younger* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners.

Despite the existence of statistically significant differences of homeowners' mean *HPKS* scores between the different levels of *Age* (p = .039); the post hoc analysis was unable to determine between which *Age* groups these differences existed. The plot of means indicated that the 25-34 year-old homeowners reported the highest mean score compared to the other age groups (Figure 5-3). Based on this reasoning, the hypothesis of homeowners who are *Younger* reporting lower *HPKS* scores than other homeowners was not supported.

The finding of *Age* not being a significant factor of *HPKS* in Florida was surprising. Many studies from the literature review found *Age* to be a significant factor. Trumbo et al. (2014) found *Age* to be the only demographic characteristic that was a semi-consistent predictor of hurricane risk perception and optimistic bias. Trumbo et al. (2014) also posited that those with the most experience were the most prepared. In some of the most convincing evidence, Sattler, Kaiser, and Hittner (2000) found gender, *age* and *income* to be significant factors that could explain more than 20% of the variance of hurricane-preparedness. Ge et al. (2011) reported that younger respondents tended to report a lower perceived hazard knowledge. This added to the thought that younger ages would report lower scores on the *HPKS*. Baker (2011) also found *Age* to be a significant factor in hurricane-preparedness and found that residents aged 30 to 45 to be the most prepared.

This current study took this into consideration and incorrectly linked age to experience. The finding of: 1) no significant differences between ages and *HPKS* scores in Florida, and 2) significant differences in the study area, even though these differences were small enough to be undetectable by the post hoc analysis, was confounding given the strong evidence from other studies.

Assumptions in this study might have been incorrect based on the location of the study area; many homeowners move to the coastal areas of the US after spending years in other regions. Moreover as previously mentioned, the US is currently in a "drought" from major hurricanes, so there is a possibility that a large percentage of this sample has never personally experienced a tropical storm or hurricane. If the younger homeowners were lifelong residents of the area, this might also explain their reported high level of knowledge. This is briefly explored later in the Future Research section.

Research Question 2: Trust in Support Entities

To recap, this study's second research question sought to quantify to what extent the same demographic characteristics (*Location, Education, Income*, and *Age*) could predict homeowners' self-reported score on this study's *Trust in Support Entities Scale (TSES)*. The affect of each of these demographic characteristics will first be explored within the state of Florida, then once again across the study area.

Location of home

$H2_{A1}$: Homeowners located in the counties of *Florida's Panhandle* will self-report <u>lower</u> scores on this study's *Trust in Support Entities Scale (TSES)* than other regions within the state.

Despite the existence of statistically significant differences of mean *TSES* scores between Florida *Regions* (p = .003), there existed no difference between Florida's *Panhandle* and other regions. Therefore, there was not support for the hypothesis that homeowners in Florida's *Panhandle* would report lower *TSES* scores than other *Regions* within the state.

This study found that South Florida (n = 305, M = 33.82, SD = 7.83) reported significantly higher scores on the TSES than North Florida (n = 163, M = 31.44, SD = 8.08) and the West Coast of Florida (n = 412, M = 31.90, SD = 7.87). It is worth mentioning that Northwest Florida reported an even higher mean TSES score than South Florida yet Tukey's post hoc test did not report this as significant. A little further research suggested that this might be due to the fewer number of responses in the Northwest region (n = 56) compared to the other regions.

There is a large military presence in Northwest Florida, and this may have an influence on reported TSES scores in this area. Another factor that might influence a higher mean TSES score in Northwest Florida could be past experiences with support entities after past tropical storms and hurricanes. Both of these possible explanations could warrant further exploration into this area of Florida in connection to homeowners' attitudes towards support entities.

$H2_{A2}$: Homeowners located in *Louisiana* will self-report <u>lower</u> scores on this study's *Trust in Support Entities Scale (TSES)* than other states within the study area.

Despite the existence of statistically significant differences of mean *TSES* scores between *States* (p < .001), there existed no difference between *Louisiana* and other states. Therefore, there was not support for the hypothesis that homeowners in *Louisiana* would report lower *TSES* scores than other *States* within the study area.

Sterett (2015) discussed the work of NGO staff and volunteers post Hurricane Katrina in *Louisiana*. She made mention of the suspicion and distrust that these caseworkers felt when suspected of working directly for FEMA. This study's hypothesis about *Louisiana* reporting low scores on the *TSES* was largely based on their experience after Katrina.

This current study found that homeowners in Southeastern *Georgia* (n = 106, M = 29.39, SD = 7.97) reported significantly lower scores than *Florida* (n = 1332, M = 32.68, SD = 7.90) and the combined area of coastal *Alabama & Mississippi* (n = 55, M = 34.00, SD = 8.84). This might be partially explained using similar rationale as applied towards *HPKS* score by *state*. If *Georgia* has experienced fewer hurricanes in the past, there may be fewer opportunities for homeowners to have positive or negative experiences with support entities. Conversely, *Alabama & Mississippi* might have had positive experiences after Hurricane Katrina. Other factors that might influence the *TSES* scores could be political climate, transparency of local government, or reputation of support entities operating in each state. The reputation of Craig Fugate (past Director and current head of FEMA) and then Bryan Koon (Current Director) at the helm of the Florida Division of Emergency Management might positively influence *TSES* scores in *Florida*.

Highest education level of homeowner

$H2_{B1}$: Florida homeowners attaining *less than a bachelor's degree* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other homeowners within the state.

There were no statistically significant differences of Floridian homeowners' mean *TSES* scores between the different levels of *Education* (p = .090). Therefore the hypothesis of Floridian homeowners who attain *less than a Bachelor's Degree* reporting lower *TSES* scores than other Floridian homeowners was not supported.

$H2_{B2}$: Homeowners from across the study area attaining *less than a bachelor's degree* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)*.

There were no statistically significant differences of homeowners' mean *TSES* scores between the different levels of *Education* (p = .070). Therefore the hypothesis of homeowners who attain *less than a Bachelor's Degree* reporting lower *TSES* scores than other homeowners was not supported.

Kim's (2015) findings that increased education was related to increased trust in Federal and Local governments, yet decreased trust in State governments influenced these hypotheses. In asking about confidence in homeowners' federal government (FEMA), local government, and community; the decision to view increasing education as an indicator of increasing trust was made. The relationship between education and trust was also partially based on studies that have linked perceived customer trust to increased customer knowledge. For this study, it appears that too much emphasis was placed on increased knowledge of a subject and education being synonymous. In retrospect, it is understandable how a formal education is not equivalent to increased subject knowledge in the operation and function of support entities.

Household income

$H2_{C1}$: Florida homeowners with *lower levels of household income* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other homeowners within the state.

There were no statistically significant differences of Floridian homeowners' mean *TSES* scores between the different levels of *Income* (p = .999). Therefore the hypothesis of Floridian homeowners claiming lower *Incomes* reporting lower *TSES* scores than other homeowners was not supported.

$H2_{C2}$: Homeowners from across the study area with *lower levels of household income* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other homeowners.

There were no statistically significant differences of homeowners' mean *TSES* scores between the different levels of *Income* (p = .596). Therefore the hypothesis of homeowners of lower *Incomes* reporting lower *TSES* scores than other homeowners was not supported.

The rationale for generating these hypotheses was based on work such as that of Meyer et al. (2012) in the demographic indicators of trust in government health policy makers. Trust in government was found to be diminished in areas of lower income. Further review of literature found a study by Kim (2015) that suggested that trust in Federal and State governments decreased slightly with increasing income. This contradiction may be the result of slightly different composition in the various types of trust being studied.

This current study found that income was clearly not an indicator of TSES score, especially in Florida (p = .999). This finding was surprising at first, yet in finding conflicting support afterwards makes this easier to understand. This is indicative of income not being related to *TSES* scores at all.

Age of homeowner

$H2_{D1}$: Florida homeowners who are *younger* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other homeowners within the state.

Despite the existence of statistically significant differences of Floridian homeowners' mean *TSES* scores between levels of *Age* (p < .001), the analysis indicated that the youngest group, 25-34 years, reported higher *TSES* scores than two of the older groups. Therefore, there was not support for the hypothesis that Floridian homeowners who are *Younger* would report lower *TSES* scores than other *Age Groups* within Florida.

$H2_{D2}$: Homeowners from across the study area who are *younger* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other homeowners.

Despite the existence of statistically significant differences of homeowners' mean *TSES* scores between *Age Groups* ($p < .001$), the analysis indicated that the youngest group, 25-34 years, reported higher *TSES* scores than two of the older groups. Therefore, there was not support for the hypothesis that homeowners who are *Younger* would report lower *TSES* scores than other *Age* Groups within the study area.

The premise for these hypotheses came from studies suggesting the important influence that past experiences have on an individual's feelings towards an individual, organization, or entity. One explanation for this could be the combination of the study area being a desirable location to retire to and the years that have passed since a major hurricane. Both of these could essentially negate the influence that previous experience may have on learned trust of support entities. Another issue of having a higher proportion of homeowners moving to this area could be that they bring negative, or positive experiences with them from the locations which they arrived.

Multiple Regression Analyses Implications

Hurricane-Preparedness Knowledge Scale (HPKS)

Florida regions

A multiple linear regression was calculated to predict Floridian homeowners' *HPKS* score based on *Region of Florida* and *Income*. A significant regression equation was found (F(2,1329) = 36.688, $p < .001$), with an adjusted R^2 of .051. Floridian homeowners' predicted *HPKS* scores were equal to 35.120 + (1.029 * [*REGION OF FLORIDA*]) + (0.697 * [*INCOME*]), where *Region of Florida* and *Income* values corresponded to Table 5-2. Therefore, the base *HPKS* score was 35.120 and increased by a multiple of 1.029 depending upon the *Region of Florida*, and increased 0.697 for each increase in *Household Income* level. Both variables were significant predictors of *HPKS* score.

Study area

A multiple linear regression was calculated to predict homeowners' *HPKS* score based on *State* and *Income*. A significant regression equation was found (F(2, 1940) = 19.419, $p < .001$), with an adjusted R^2 of .019. Homeowners' predicted *HPKS* scores were equal to 37.036 + (0.806 * [*STATES*]) + (0.553 * [*INCOME*]), where *States* and *Incomes* values corresponded to Table 5-3. Therefore, the base *HPKS* score was 37.036 and increased by a multiple of 0.806 depending on the *State*, and increased 0.553 for each increase in the *Income* level. Both the *States* and *Income* variables were significant predictors of *HPKS* score.

Trust in Support Entities Scale (TSES)

Florida regions

A multiple linear regression was calculated to predict Floridian homeowners' *TSES* score based on *Age*. A significant regression equation was found (F(3,1328) = 10.892, $p < .001$), with an adjusted R^2 of .022. Floridian homeowners' predicted *TSES* scores were equal to 34.364 + (0.581 * [REGION]) – (0.543 * [AGE]) – (0.423 * [EDUCATION]), where the *Region*, *Age,* and *Education* values corresponded to Table 5-4. Therefore, the base *TSES* score was 34.364 and increased 0.581 for each increase in *Florida Region*, decreased by 0.543 for each level increase in *Age,* and decreased by 0.423 each level increase in *Education*. The Florida Region, *Age,* and *Education* variables were significant predictors of Floridian *TSES* score.

Study area

A multiple linear regression was calculated to predict homeowners' *TSES* score based on *State* and *Age*. A significant regression equation was found ($F(2, 1940) = 15.833$, $p < .001$), with an adjusted R^2 of .015. Homeowners' predicted *TSES* scores were equal to 32.230 + (0.830 * [*STATE*]) – (0.455 * [*AGE*]), where *States* and *Age* values corresponded to Table 5-5. Therefore, the base *TSES* score was 32.230 and increased by 0.830 for each increasing *State* value, and decreased by 0.455 for each increasing value of *Age*. Both the *State* and *Age* variables were significant predictors of *TSES* score.

The very low percentage of explained variance in homeowners' TSES scores provided as many questions as answers in this study. Were the demographic characteristics of this study merely the wrong demographics for predicting TSES scores or are demographics in general not an indicator of these scores? Clearly *Household Income* did not lend any aid in predicting TSES scores, but perhaps race/ethnicity or marital status may provide insights. There also exists the possibility that demographics simply were not components of the *TSES* scores. When studying topics such as "trust," there are often difficulties in quantifying these affects, which leads to even more complication when determining predictors. Variables that are tied to homeowners' mental states, perceptions, or other intangible items may provide more definitive results.

Descriptive Implications

Through the analysis process the differences between groups were explored as well as the presence of predictors of the two scales developed (*HPKS* and *TSES*). Not all differences were found to be statistically significant. These differences are still useful in discussing descriptive differences of the study's sample and may not be generalized beyond this sample. The differences that were found to be significant may be generalized to the target population. Table 5-6 describes generalizations of the homeowners scoring in the two extremes of the *HPKS* and *TSES*. The areas that are appropriate to generalize outside of the sample are identified.

Summary of Implications

An underpinning of the *HPKS* aspect of this study was the understanding that before homeowners can consider making a behavior change to be more prepared for natural disasters such as hurricanes, there must exist an awareness about preparedness. This awareness that can involve homeowners' knowledge, attitudes, skills and aspirations concerning hurricane preparedness.

The knowledge aspect of awareness is simply learning more about hurricanes as a weather disturbance, what types of preparedness products exist, and what preparedness best practices (behaviors) exist for homeowners. In addition to becoming more aware of these, homeowners can learn how to evaluate how effective each product or behavior could be in their specific circumstance. For example, learning ways to mitigate damage from storm surge is more of a priority to a homeowner living in low-lying areas near a body of water than homeowners in other situations.

Homeowners' attitudes must involve a degree of positive self-efficacy towards preparedness before any behavior changes are initiated as well. In other words, if homeowners do not understand and then also believe that they are capable of successfully making a change towards becoming better prepared for a natural disaster, then the process will never begin in earnest and they are destined to fail before they have begun.

The skills that must be learned by homeowners as they become more prepared for hurricanes involve a component of the knowledge aspect mentioned earlier. Homeowners learning that a specific preparedness behavior exists is the first step, then becoming more confident in the effectiveness of the behavior results from observing the behavior. Only after these steps can the homeowners then practice or role-play the behavior to learn the skill. Sometimes all of these steps overlap and occur quickly, such as during training events or at home shows demonstrating new products and behaviors. In these situations it is often difficult for homeowners to determine when and how they successfully gained knowledge and confidence in the effectiveness of a product or behavior, or even when they themselves gained a higher level of self-efficacy in demonstrating the product or behavior.

Finally, homeowners’ must desire to increase the level of preparedness in themselves, family members, and/or their homes. Without these aspirations, behavior changes cannot occur. It has been argued that this prerequisite of behavior change is the most critical because no matter how educated on a subject an individual becomes, without a desire to change there will be no change. This remains true for hurricane preparedness.

The *Trust in Support Entities Scale* (*TSES*) was of interest to explore because this level of trust affects the influence that these entities exert on homeowners. This trust may be expressed as confidence in the entities' abilities to help during a crisis and thus was a consideration when the scale was named. By better understanding what factors influence, and in turn aid in predicting areas or populations about diminished trust, these support entities can more effectively target areas/populations for outreach programs. The areas/populations with high levels of trust might also serve as a targeted audience from which these entities can solicit donations, monetary or time volunteering.

The aphorism "A rising tide lifts all boats" may be applied towards programs that may work towards increasing *HPKS* scores and *TSES* scores in areas. It stands to reason that areas of high *HPKS* scores and high *TSES* scores pose the least resistance to efforts to increase the physical preparedness of homeowners as well as supporting efforts to increase the resilience of their community to natural disasters.

Future Research

The hypotheses of this study, while not predominately supported, provided many additional opportunities for future research. This future research could attempt to increase understanding of why the study area and scales did not provide the support anticipated by the hypotheses, or explore additional factors to increase the variance explained in the scale scores. Specific research questions may discuss what aspects of the *HPKS* measure caused *education* to not be significant when it has been in past studies (Gee et al., 2011; Baker, 2011).

A brief, additional literature review was performed that focused on possible explanations for the findings of several hypotheses not being supported. During this literature review, two additional factors of interest were found in several prior studies concerned with natural-disaster preparedness knowledge. The increased length of time that homeowners had lived in their community and the presence of minors were both suggested as indicators of increased disaster preparedness knowledge (Solis, Thomas & Letson, 2010). Both of these factors could be valid foci for future research in the area of hurricane-preparedness knowledge. Further inspection of the survey instrument revealed that these factors were addressed during the data-collection process.

Time living in community

The analyses of differences in *HPKS* scores based on *Time Living in Community* can be found in Appendix D. The analysis indicated that homeowners' *HPKS* had indeed increased based on the increase of *Time Living in Community* (Figure 5-5). The *HPKS* scores of homeowners living in their community for fewer than 10 years were significantly lower than those living there 20 years or more. Coincidently, these findings aligned with the 10 year drought from major hurricanes. In other words, homeowners who lived in the study area for at least 10 years before the last major hurricanes reported significantly higher scores on the HPKS. These findings support the explanation for why *Age* was not found to be a significant indicator of *HPKS* scores in this current sample.

Minors present in household

The analyses of differences in *HPKS* scores based on *Minors* present in household can be found in Appendix E. The analysis indicated that homeowners' *HPKS* did indeed increase based on the presence of *Minors* in the household. The mean *HPKS* score of households with *Minors Present* was 1.06, 95% CI [0.18 to 1.94] higher than the mean *HPKS* score of households with *No Minors*. This difference was statistically significant, $t(1046) = -2.36$, $p = .018$.

Policy Implications

By quantifying homeowners' hurricane-preparedness knowledge in the *HPKS* scores, this study sought to learn more about what areas and populations were lagging in this area of awareness. Based on the findings of this current study, *low-income* areas of *North Florida* appear to be the population that would most benefit from hurricane-preparedness education programs. This finding would also suggest that this area might not be willing to embrace hurricane-preparedness behavior change due to this lack of awareness.

Much like *North Florida* was indicated as an area that would benefit from hurricane-preparedness education programs, Southeastern *Georgia* appears to possess that same need. The proximity of these two areas would allow for a regional focus whether through Federal coordination or cooperatively between the state of *Florida* and *Georgia*.

Given the results of the analyses of the additional variables of *Time Living in Community* and *Minors*, it was suggested that homeowners that are new to the study area, especially those without minors in their household would benefit the most from hurricane-preparedness education courses. As previously mentioned, the populations reporting higher *HPKS* scores could be a beneficial resource for working with others. Soliciting residents to assist with delivering these programs that have been in the area more than 20 years who have minors living in their household could be the most effective.

The results of the analyses of the homeowners' *TSES* scores would show entities such as FEMA, Red Cross, county emergency management, and local governments where and who to target for outreach programs. These areas or populations of diminished support could be the result of a myriad of factors ranging from perceptions of these entities in general to past negative interactions with the entities whether personally experienced by the homeowners or by their friends or family members.

Another benefit of learning more about areas and populations of low or high *HPKS* and *TSES* scores could allow emergency management personnel to more efficiently deploy resources in times of crisis. Based on the findings of this current study, the low-income areas of Southeastern *Georgia* would be an area of above-average need, if ever hit by a major hurricane. Therefore, resources could be relocated from areas of lesser need depending on the predicted trajectory of an approaching hurricane.

Further Limitations

During the interpretation of the findings of this current study, it became clear that exploration of additional variables would be needed to explain the variance in *HPKS* and *TSES* scores to an acceptable level. The multiple linear regression models only used one to two of the four IVs and those variables used produced an adjusted R^2 of 5.1% in the best model (*HPKS* score of Floridian Homeowners).

Conclusions

There is no denying the necessity of hurricane-preparedness in the Southeastern US. Even after more than a decade has passed, the mention of Hurricanes Katrina, Andrew, Ike, Wilma, Rita, Charley, Irene, Hugo, and Ivan evokes memories and images of the magnitude of destruction and devastation that these storms brought to coastal communities. Public safety is the responsibility of emergency managers who are tasked with always maintaining a level of preparedness, even during times when storms have been absent for long periods, which ultimately diminishes the public's (and often government officials') priority to being prepared for storms. The motivation for this study was to better understand homeowners' level of knowledge about hurricane-preparedness as well as their feelings concerning their trust or confidence in the entities that exist to provide support in times of crisis. This will assist these emergency managers, homeowners, and government officials in maintaining the priority of preparedness.

The two scales introduced by this study: the *Hurricane-Preparedness Knowledge Scale (HPKS)* and the *Trust in Support Entities Scale (TSES)* propose slight variations from previous scales in this field of research. Due to these differences and that they are previously untested scales, there is much to learn about them before they are fully understood. The usefulness of the *HPKS* and *TSES* is their ability to be similar to prior research, yet just different enough to provide a slight twist in perspective to the existing body of knowledge. What has been learned in this study and what can be learned by further exploring these scales adds depth and diversity to what is currently understood, which further exploration of existing scales could not provide.

The differences in homeowners' *HPKS* scores between groups segmented by the demographic characteristics of *location*, *education, income* and *age* were all explored. Responses across the entire study area as well as the sub-sample in Florida showed that homeowners' *HPKS* scores differ significantly by *Location* and *Household Income*. Among homeowners in the entire sample, *HPKS* scores were also observed to differ significantly by *Age*.

The differences in homeowners' *TSES* scores between groups segmented by the demographic characteristics of *location*, *education, income* and *age* were also explored.

Homeowners in the study area as well as Floridian homeowners detected statistically significant differences in their *TSES* scores by *Location,* as well as *Age*.

The intent of this study's first research question was to determine if the selected demographic characteristics could be used to predict homeowners' *HPKS* scores. Thus, it was observed that the *Region of Florida* and *Household Income* were highly significant indicators of Floridian homeowners' *HPKS* scores. Despite their high level of significance, these indicators could only explain a small percentage of the variance in homeowners' *HPKS* scores in Florida. That is to say, approximately 95% of the Floridian homeowners' *HPKS* scores can be attributed to factors outside of this study. Even though the analysis of the study area's homeowners mirrored the Florida analysis as much as *Location* and *Household Income* were highly significant indicators, they too could only explain a small amount of the variance in *HPKS* scores of homeowners from across the study area. These low percentages of variance explained demonstrated the need for further exploration of additional indicators of homeowners' *HPKS* scores in the future.

The second research question of this study explored the feasibility of the demographic characteristics as predictors of homeowners' *TSES* scores. This scale sought to quantify trust or confidence that homeowners held for support entities that provide aid during and after hurricanes and other natural disasters. The analysis of Floridian homeowners revealed that the homeowners' *Region of Florida*, *Age*, and *Education* were all significant indicators of their *TSES* scores. As in the previous research question's analysis, although significant, these indicators could only explain a small portion of the variance in Floridian homeowners' *TSES* scores. When including the responses of homeowners in the entire study area, *Education* was no longer a significant indicator, which left *State* and *Age* as the only indicators remaining in the regression model. These indicators explained less than 2% of the variance in homeowners' *TSES* scores. This low percentage of variance explained suggests that a large number of predictors remain unidentified.

By finding the differences in, and predictors of *HPKS* and *TSES* scores, these results can be generalized to the homeowners across the study area allowing policymakers and support entities to better target specific populations with tailored outreach programs. The tailoring of information delivery and marketing to targeted audiences has been widely studied and has been accepted as more efficient and effective versus mass marketing campaigns.

Specifically advancing the understanding in the areas of hurricane-preparedness knowledge and trust in support entities, policymakers and support providers will be able to more effectively conduct public outreach to homeowners. Homeowners who possess relatively high levels of knowledge and trust will be more open to not only increasing their own homes' preparedness but also receptive to backing community measures to better protect the entire community.

Table 5-1. Summary of hypotheses conclusions

Hypothesis	Abbreviated description	Significance	Determination
H1A1	Florida Panhandle HPKS < Other Regions HPKS	$p < .001$	Not Supported
H1A2	Georgia HPKS < Other States HPKS	$p < .001$	Supported
H1B1	Floridian less than Bachelor's Degree HPKS < Floridian Bachelor's Degree or higher HPKS	$p = .270$	Not Supported
H1B2	Less than Bachelor's Degree HPKS < Bachelor's Degree or higher HPKS	$p = .082$	Not Supported
H1C1	Floridian lower income HPKS < Floridian upper Income HPKS	$p < .001$	Supported
H1C2	Lower income HPKS < Upper Income HPKS	$p < .001$	Supported
H1D1	Floridian younger HPKS < Floridian older HPKS	$p = .123$	Not Supported
H1D2	Younger HPKS < Older HPKS	$p = .039$	Not Supported
H2A1	Florida Panhandle TSES < Other Regions TSES	$p = .003$	Not Supported
H2A2	Louisiana TSES < Other States TSES	$p < .001$	Not Supported
H2B1	Floridian less than Bachelor's Degree TSES < Floridian Bachelor's Degree or higher TSES	$p = .090$	Not Supported
H2B2	Less than Bachelor's Degree TSES < Bachelor's Degree or higher TSES	$p = .070$	Not Supported
H2C1	Floridian lower income TSES < Floridian upper Income TSES	$p = .999$	Not Supported
H2C2	Lower income TSES < Upper Income TSES	$p = .596$	Not Supported
H2D1	Floridian younger TSES < Floridian older TSES	$p < .001$	Not Supported
H2D2	Younger TSES < Older TSES	$p < .001$	Not Supported

Table 5-2. Values assigned to *Income* and *Florida Region* variables for *HPKS* model 1

Income	Value	Florida Region
Up to $14,999	0	North Florida
$15,000-$24,999	1	West Coast
$25,000-$34,999	2	Panhandle
$35,000-$49,999	3	East Coast
$50,000-$74,999	4	South Florida
$75,000-$99,999	5	Northwest
$100,000-$149,999	6	
$150,000 or more	7	

Table 5-3. Values assigned to *Income* and *States* variables for *HPKS* model 2

Income	Value	States
Up to $14,999	0	Georgia
$15,000-$24,999	1	Florida
$25,000-$34,999	2	Texas
$35,000-$49,999	3	Alabama & Mississippi
$50,000-$74,999	4	Louisiana
$75,000-$99,999	5	
$100,000-$149,999	6	
$150,000 or more	7	

Table 5-4. Values assigned to *Florida Region*, *Age,* and *Education* for *TSES* model 1

Florida Region	Value	Age	Education
North Florida	0	25-34 years	HS Diploma or less
West Coast	1	35-44 years	Some college up to AA/AS
Panhandle	2	45-54 years	Bachelor's Degree
East Coast	3	55-64 years	Master's Degree
South Florida	4	65-75 years	Doctoral Degree
Northwest	5		

Table 5-5. Values assigned to *Age* and *State* variables for *TSES* Model 2

Age	Value	State
25-34 years	0	Georgia
35-44 years	1	Texas
45-54 years	2	Louisiana
55-64 years	3	Florida
65-75 years	4	Alabama & Mississippi

Table 5-6. Descriptive generalizations

	HPKS scores		TSES scores	
Indicators	Lowest	Highest	Lowest	Highest
Florida Region	North Florida*	Northwest Florida*	North Florida*	Northwest Florida*
State	Georgia*	Louisiana	Georgia*	Alabama & Mississippi
Education	HS Diploma or less	Master's Degree	Doctoral Degree	HS Diploma or less
Income	Up to $14,999*	$150,000 or more*	Up to $14,999	$25,000-$34,999
Age	45-54 years	25-34 years	45-54 years	25-34 years
Years in Community	Less than 6 months*	20 years or more*		
Minors in Household	No*	Yes*		

* indicates $p < .05$

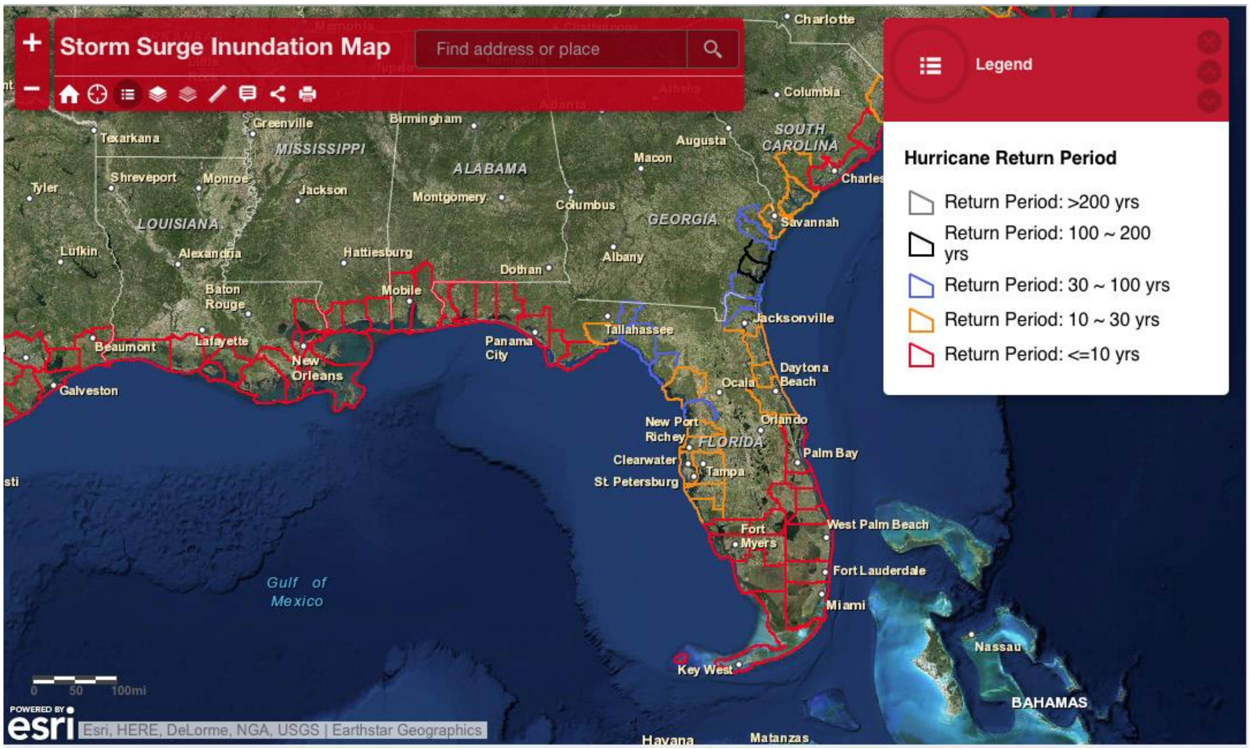

Figure 5-1. Hurricane return period (EPA, 2010)

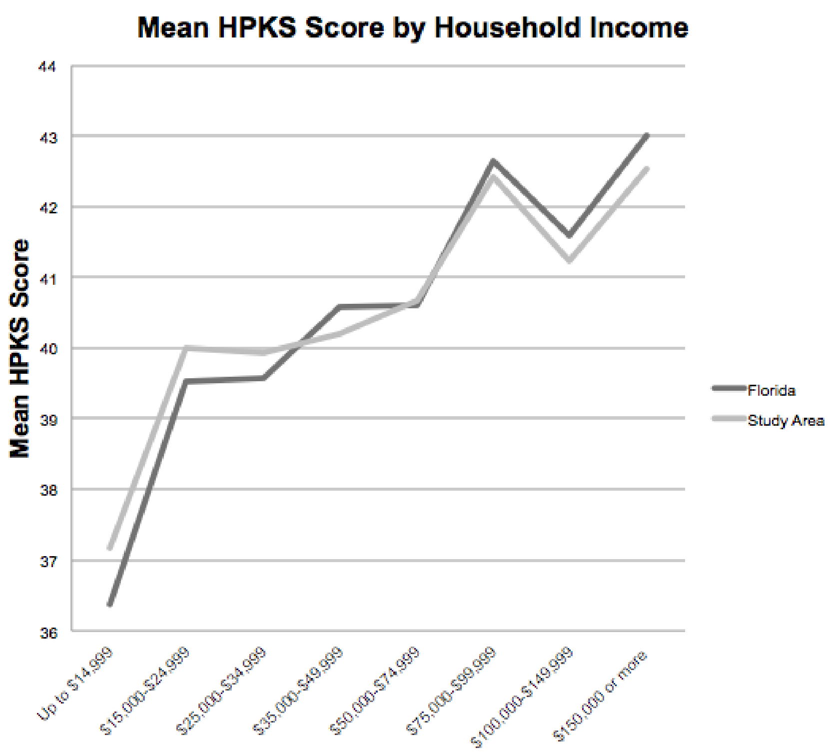

Figure 5-2. Mean *HPKS* score by *Household Income*

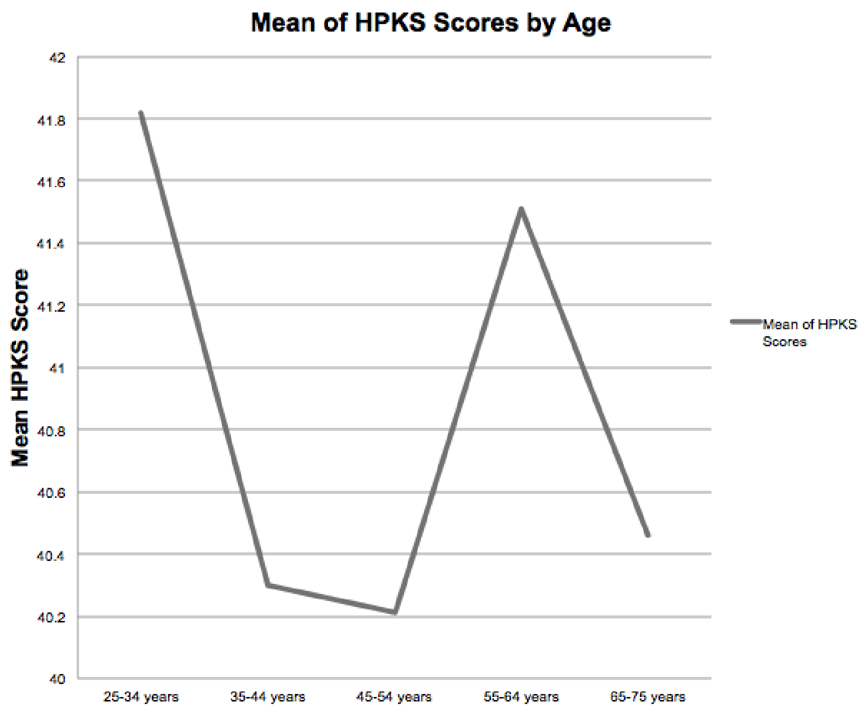

Figure 5-3. Mean of *HPKS* scores by *Age*

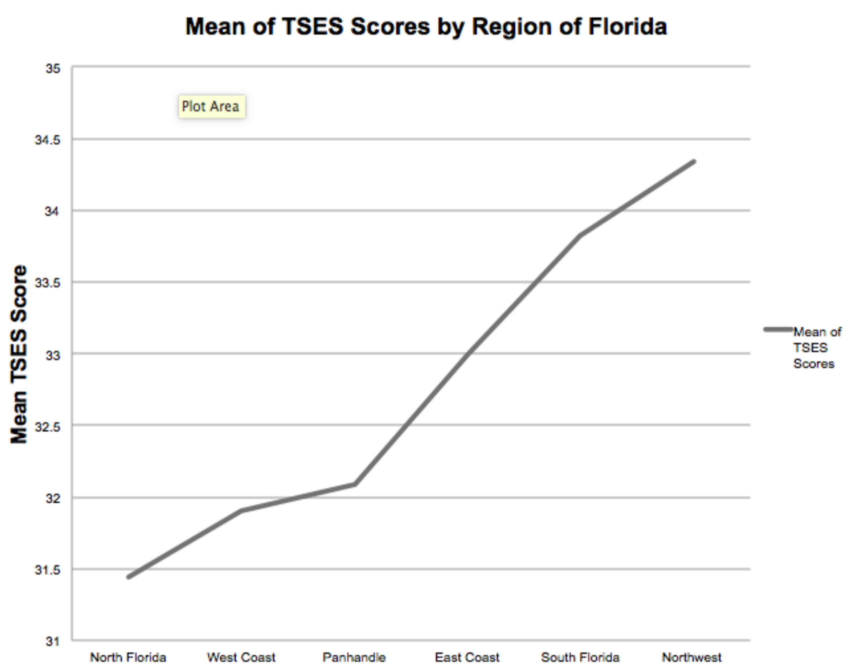

Figure 5-4. Mean of *TSES* scores by *Region of Florida*

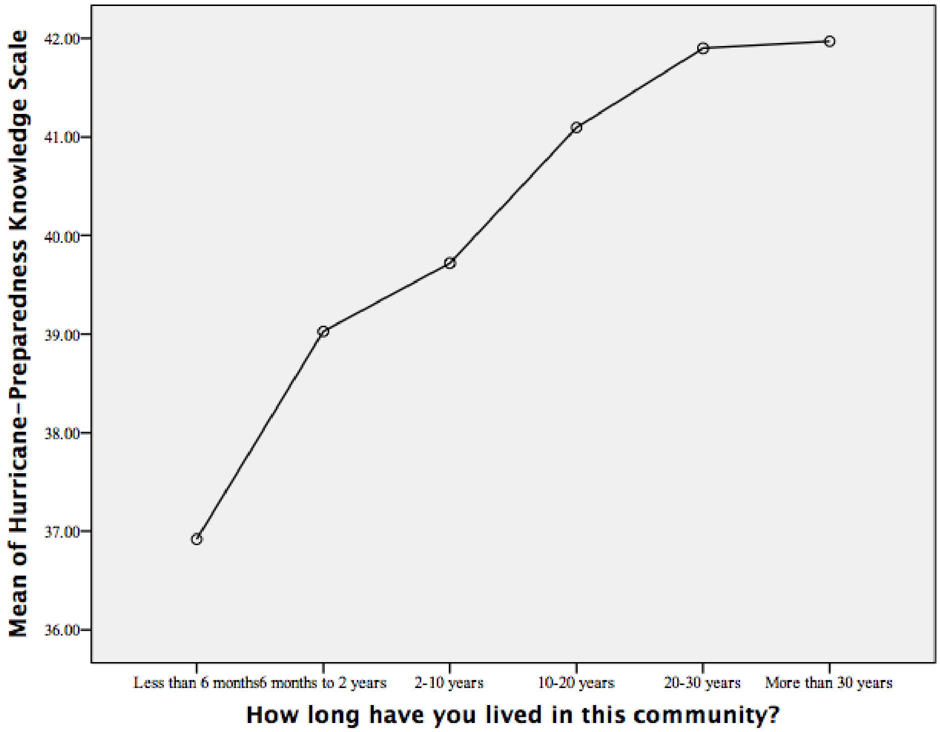

Figure 5-5. Mean *HPKS* score by *Time Living in Community*

APPENDIX A
DESCRIPTIVE STATISTICS OF THE SAMPLE

Table A-1. Gender distribution of sample

		Frequency	Percent
Valid	Male	771	39.7
	Female	1,172	60.3
	Total	1,943	100.0

Table A-2. Age distribution of sample

		Frequency	Percent	Cumulative Percent
Valid	25-34 years old	249	12.8	12.8
	35-44 years old	305	15.7	28.5
	45-54 years old	403	20.7	49.3
	55-64 years old	534	27.5	76.7
	65-75 years old	452	23.3	100.0
	Total	1,943	100.0	

Table A-3. Education distribution of sample

		Frequency	Percent	Cumulative Percent
Valid	Did not complete High School	29	1.5	1.5
	GED or High School Diploma	279	14.4	15.9
	Some College	411	21.2	37.0
	Technical Certificate	103	5.3	42.3
	Associate Degree	216	11.1	53.4
	Bachelor Degree	567	29.2	82.6
	Master Degree	282	14.5	97.1
	Doctoral Degree	56	2.9	100.0
	Total	1,943	100.0	

Table A-4. Income distribution of sample

		Frequency	Percent	Cumulative Percent
Valid	Up to $14,999	82	4.2	4.2
	$15,000-$24,999	137	7.1	11.3
	$25,000-$34,999	219	11.3	22.5
	$35,000-$49,999	264	13.6	36.1
	$50,000-$74,999	496	25.5	61.7
	$75,000-$99,999	355	18.3	79.9
	$100,000-$149,999	260	13.4	93.3
	$150,000 or more	130	6.7	100.0
	Total	1943	100.0	

Table A-5. Distribution of sample by state

		Frequency	Percent	Cumulative Percent
Valid		1	.1	.1
	Alabama	37	1.9	2.0
	Florida	1,331	68.5	70.5
	Georgia	106	5.5	75.9
	Louisiana	121	6.2	82.1
	Mississippi	18	.9	83.1
	Texas	329	16.9	100.0
	Total	1,943	100.0	

APPENDIX B
DETAIL OF REVISED PRINCIPAL COMPONENTS ANALYSIS

Table B-1. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.878
Bartlett's Test of Sphericity	Approx. Chi-Square	24579.652
	df	406
	Sig.	.000

Table B-2. Total variance explained by PCA

	Initial Eigenvalues			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.373	21.975	21.975	4.139	14.272	14.272
2	3.678	12.681	34.657	4.028	13.890	28.161
3	2.790	9.621	44.278	2.793	9.632	37.794
4	1.959	6.757	51.035	2.597	8.955	46.749
5	1.647	5.680	56.714	2.573	8.872	55.621
6	1.423	4.907	61.621	1.740	6.000	61.621

Extraction Method: Principal Component Analysis.

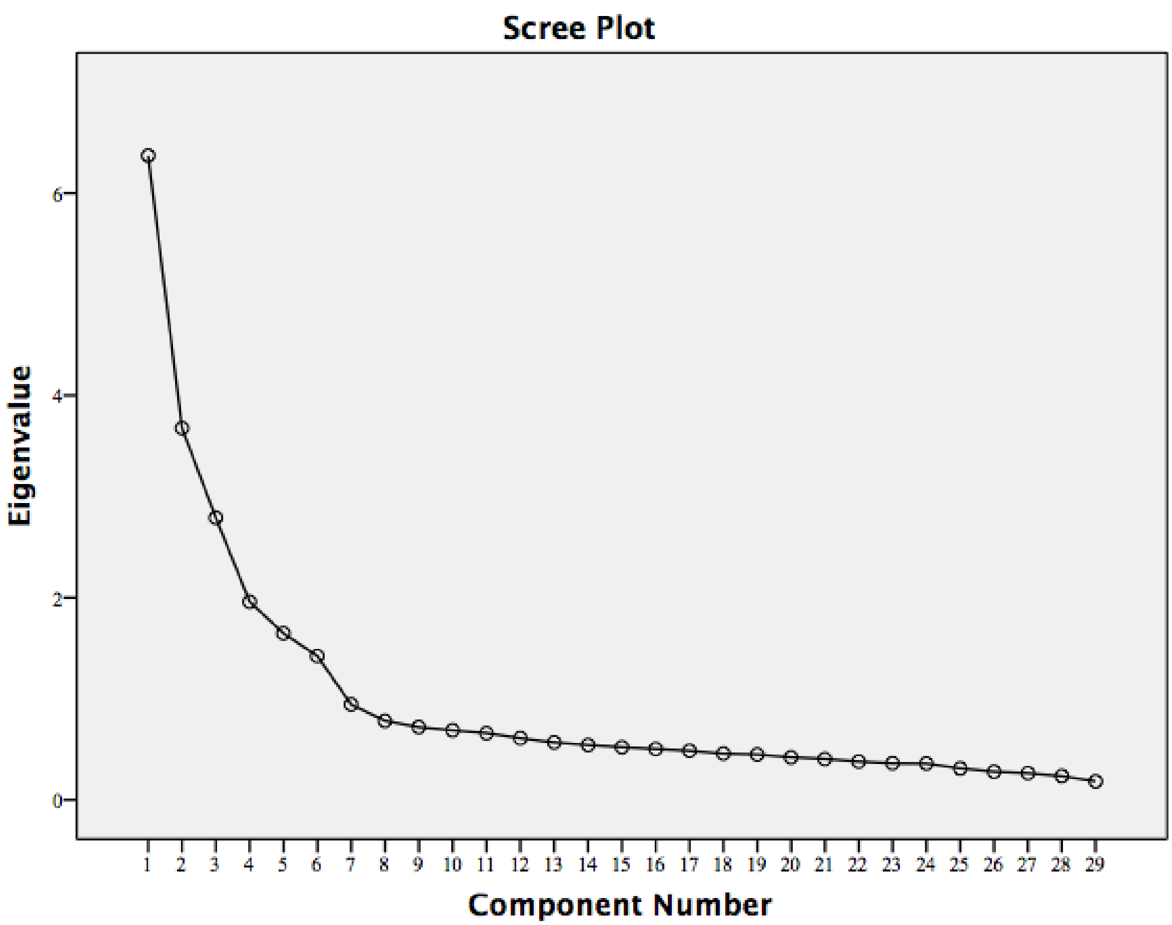

Figure B-1. Screeplot of PCA component eigenvalues

Table B-3. Rotated Component Matrix

	Component					
	1	2	3	4	5	6
Q4.52	.812					
Q4.39	.794					
Q4.37	.793					
Q4.30	.767					
Q4.22	.689	.323				
Q4.45	.591					
Q4.41		.754				
Q4.38		.685				
Q4.42	.322	.670				
Q4.44		.663				
Q4.49		.650			.328	
Q4.13		.648				
Q4.47		.647				
Q4.12		.512				
Q4.15			.782			
Q4.27			.756			
Q4.14			.733			
Q4.16			.632			
Q4.26	.422		.627			
Q4.6				.908		
Q4.7				.899		
Q4.8				.882		
Q4.56					.734	
Q4.53					.664	
Q4.46					.648	
Q4.10					.590	
Q4.48		.334			.517	
Q4.1						.926
Q4.4						.911

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Component 1: Knowledge

Q4.52. I know a lot about disaster planning and ways to prepare my home for natural disasters.
Q4.39. How prepared for a natural disaster do you feel that your home is?
Q4.37. How would you rate your knowledge of disaster preparedness?
Q4.30. I have adequate information on what to do in the event of a natural disaster.
Q4.22. I make time to plan and make physical preparations for natural disasters.
Q4.45. What affect do you feel that your home’s level of disaster preparedness will have on your future quality of life?

Table B-4. Component 1: Inter-item correlation matrix

	Q4.52	Q4.39	Q4.37	Q4.30	Q4.22	Q4.45
Q4.52	1.000					
Q4.39	.567	1.000				
Q4.37	.657	.560	1.000			
Q4.30	.683	.567	.593	1.000		
Q4.22	.591	.512	.503	.534	1.000	
Q4.45	.446	.506	.398	.461	.468	1.000

Table B-5. Component 1: Reliability statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.875	.874	6

Component 2:

Q4.41. How interested are you in making your home more prepared for a natural disaster?
Q4.38. How important do you feel it is to prepare for disasters?
Q4.42. How important is it to you to maintain the level of disaster preparedness of your home?
Q4.44. How do you feel that the quality of your life would be affected if your home was more prepared for a natural disaster?
Q4.49. I wish I could financially afford to make my home more prepared for a natural disaster.
Q4.13. I often think about what might happen in the future.
Q4.47. How would you feel if your home was more prepared for a natural disaster than your neighbors' homes?
Q4.12. I often think about what has happened in the past.

Table B-6. Component 2: Inter-item correlation matrix

	Q4.41	Q4.38	Q4.42	Q4.44	Q4.49	Q4.13	Q4.47	Q4.12
Q4.41	1.000							
Q4.38	.568	1.000						
Q4.42	.552	.629	1.000					
Q4.44	.467	.451	.478	1.000				
Q4.49	.390	.260	.240	.307	1.000			
Q4.13	.394	.354	.383	.359	.363	1.000		
Q4.47	.469	.447	.441	.445	.306	.299	1.000	
Q4.12	.314	.273	.299	.298	.248	.529	.223	1.000

Table B-7. Component 2: Reliability statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.821	.834	8

Component 3: Trust in Support Entities

Q4.15. The local government (ex. County Emergency Management) can be depended on to assist during a crisis.
Q4.27. My local government is prepared to handle a natural disaster.
Q4.14. The federal government (ex. FEMA) can be depended on to assist during a crisis.
Q4.16. Non-profit organizations (ex. Red Cross) can be depended on to assist during a crisis.
Q4.26. My community has adequate resources to handle a natural disaster.

Table B-8. Component 3: Inter-item correlation matrix

	Q4.15	Q4.27	Q4.14	Q4.16	Q4.26
Q4.15	1.000				
Q4.27	.621	1.000			
Q4.14	.493	.439	1.000		
Q4.16	.406	.355	.409	1.000	
Q4.26	.503	.618	.356	.296	1.000

Table B-9. Component 3: Reliability statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.800	.803	5

Component 4:

Q4.6. The gulf/ocean waters seem the same to me as they always have.
Q4.7. The gulf/ocean shores seem the same to me as they always have.
Q4.8. The gulf/ocean marine life seem the same to me as they always have.

Table B-10. Component 4: Inter-item correlation matrix

	Q4.6	Q4.7	Q4.8
Q4.6	1.000		
Q4.7	.809	1.000	
Q4.8	.764	.773	1.000

Table B-11. Component 4: Reliability statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.915	.915	3

Component 5:

Q4.56. I do not have the time to prepare my home for natural disasters.
Q4.53. Other members of my household are not interested in preparing our home for natural disasters.
Q4.46. How would you feel if your home was less prepared for a natural disaster than your neighbors' homes?
Q4.10. I have traded goods/services for things that I need.
Q4.48. Disaster preparation products are too expensive.

Table B-12. Component 5: Inter-item correlation matrix

	Q4.56	Q4.53	Q4.46	Q4.10	Q4.48
Q4.56	1.000				
Q4.53	.453	1.000			
Q4.46	.435	.411	1.000		
Q4.10	.286	.235	.266	1.000	
Q4.48	.322	.283	.220	.167	1.000

Table B-13. Component 5: Reliability statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.683	.690	5

Component 6:

Q4.1. How long have you lived in this community?
Q4.4. How long has your family (immediate or extended), lived in this community?

Table B-14. Component 6: Inter-item correlation matrix

	Q4.1	Q4.4
Q4.1	1.000	
Q4.4	.724	1.000

Table B-15. Component 6: Reliability statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.814	.840	2

APPENDIX C
DETAIL OF OUTLIER LABELING RULE CALCULATIONS

Table C-1. Hypothesis $H1_{A1}$: *HPKS* by *Florida Region*

Outlier Labeling Rule	Q1	Mean	Q3	Range	g	Lower Bound	Upper Bound
Northwest	37.00	44.00	49.75	12.75	2.20	8.95	77.80
Panhandle	35.00	40.00	47.00	12.00	2.20	8.60	73.40
North	33.00	38.00	45.00	12.00	2.20	6.60	71.40
West	34.00	38.00	46.00	12.00	2.20	7.60	72.40
East	35.00	41.50	48.00	13.00	2.20	6.40	76.60
South	37.00	43.00	49.00	12.00	2.20	10.60	75.40

Table C-2. Hypothesis $H1_{A2}$: *HPKS* by *State*

Outlier Labeling Rule	Q1	Mean	Q3	Range	g	Lower Bound	Upper Bound
Georgia	32.00	36.00	44.25	12.25	2.20	5.05	71.20
Florida	35.00	40.00	47.00	12.00	2.20	8.60	73.40
Alabama & Mississippi	36.00	43.00	48.00	12.00	2.20	9.60	74.40
Louisiana	36.00	43.00	49.00	13.00	2.20	7.40	77.60
Texas	35.00	41.00	47.00	12.00	2.20	8.60	73.40

Table C-3. Hypothesis $H1_{B1}$: *HPKS* by *Education* (Florida)

Outlier Labeling Rule	Q1	Mean	Q3	Range	g	Lower Bound	Upper Bound
HS Diploma or less	34.00	39.00	46.00	12.00	2.20	7.60	72.40
Some college up to AA/AS	35.00	41.00	47.00	12.00	2.20	8.60	73.40
Bachelor's Degree	35.00	41.00	48.00	13.00	2.20	6.40	76.60
Master's Degree	35.00	41.00	47.00	12.00	2.20	8.60	73.40
Doctoral Degree	34.00	40.00	48.00	14.00	2.20	3.20	78.80

Table C-4. Hypothesis $H1_{B2}$: *HPKS* by *Education*

Outlier Labeling Rule	Q1	Mean	Q3	Range	g	Lower Bound	Upper Bound
HS Diploma or less	34.00	39.00	46.00	12.00	2.20	7.60	72.40
Some college up to AA/AS	35.00	41.00	47.00	12.00	2.20	8.60	73.40
Bachelor's Degree	35.00	41.00	48.00	13.00	2.20	6.40	76.60
Master's Degree	36.00	41.00	48.00	12.00	2.20	9.60	74.40
Doctoral Degree	34.00	39.50	47.00	13.00	2.20	5.40	75.60

Table C-5. Hypothesis $H1_{C1}$: *HPKS* by *Income* (Florida)

Outlier Labeling Rule	Q1	Mean	Q3	Range	g	Lower Bound	Upper Bound
Up to $14,999	31.00	35.00	40.00	9.00	2.20	11.200	59.800
$15,000-$24,999	34.00	39.00	46.00	12.00	2.20	7.600	72.400
$25,000-$34,999	33.00	40.00	45.00	12.00	2.20	6.600	71.400
$35,000-$49,999	35.00	40.00	47.00	12.00	2.20	8.600	73.400
$50,000-$74,999	35.00	39.00	47.00	12.00	2.20	8.600	73.400
$75,000-$99,999	36.00	43.00	49.00	13.00	2.20	7.400	77.600
$100,000-$149,999	35.00	41.50	48.00	13.00	2.20	6.400	76.600
$150,000 or more	37.00	42.00	48.50	11.50	2.20	11.700	73.800

Table C-6. Hypothesis $H1_{C2}$: *HPKS* by *Income*

Outlier Labeling Rule	Q1	Mean	Q3	Range	g	Lower Bound	Upper Bound
Up to $14,999	32.00	35.50	42.00	10.00	2.20	10.00	64.00
$15,000-$24,999	34.00	40.00	46.00	12.00	2.20	7.60	72.40
$25,000-$34,999	33.00	40.00	47.00	14.00	2.20	2.20	77.80
$35,000-$49,999	34.25	40.00	47.00	12.75	2.20	6.20	75.05
$50,000-$74,999	35.00	40.00	47.00	12.00	2.20	8.60	73.40
$75,000-$99,999	36.00	43.00	49.00	13.00	2.20	7.40	77.60
$100,000-$149,999	35.00	41.00	47.00	12.00	2.20	8.60	73.40
$150,000 or more	36.75	42.00	48.25	11.50	2.20	11.45	73.55

Table C-7. Hypothesis $H1_{D1}$: *HPKS* by *Age* (Florida)

Outlier Labeling Rule	Q1	Mean	Q3	Range	g	Lower Bound	Upper Bound
25-34 years	36.00	42.00	48.25	12.25	2.20	9.05	75.20
35-44 years	34.00	40.00	48.00	14.00	2.20	3.20	78.80
45-54 years	35.00	40.00	47.00	12.00	2.20	8.60	73.40
55-64 years	35.00	41.00	47.00	12.00	2.20	8.60	73.40
65-75 years	34.00	40.00	47.00	13.00	2.20	5.40	75.60

Table C-8. Hypothesis $H1_{D2}$: *HPKS* by *Age*

Outlier Labeling Rule	Q1	Mean	Q3	Range	g	Lower Bound	Upper Bound
25-34 years	36.00	42.00	48.00	12.00	2.20	9.60	74.40
35-44 years	34.00	40.00	47.00	13.00	2.20	5.40	75.60
45-54 years	34.00	40.00	47.00	13.00	2.20	5.40	75.60
55-64 years	36.00	41.00	47.00	11.00	2.20	11.80	71.20
65-75 years	34.00	40.00	47.00	13.00	2.20	5.40	75.60

Table C-9. Hypothesis $H2_{A1}$: *TSES* by *Florida Region*

Outlier Labeling Rule	Q1	Mean	Q3	Range	g	Lower Bound	Upper Bound
Northwest	29.25	34.00	41.00	11.75	2.20	3.40	66.85
Panhandle	29.00	31.50	37.25	8.25	2.20	10.85	55.40
North	27.00	32.00	37.00	10.00	2.20	5.00	59.00
West	28.00	32.00	37.00	9.00	2.20	8.20	56.80
East	29.00	33.00	38.00	9.00	2.20	9.20	57.80
South	29.00	33.00	39.50	10.50	2.20	5.90	62.60

Table C-10. Hypothesis $H2_{A2}$: *TSES* by *State*

Outlier Labeling Rule	Q1	Mean	Q3	Range	g	Lower Bound	Upper Bound
Georgia	25.00	30.00	34.00	9.00	2.20	5.20	53.80
Florida	28.00	32.00	38.00	10.00	2.20	6.00	60.00
Alabama & Mississippi	30.00	34.00	39.00	9.00	2.20	10.20	58.80
Louisiana	27.50	32.00	36.00	8.50	2.20	8.80	54.70
Texas	27.00	31.00	37.00	10.00	2.20	5.00	59.00

Table C-11. Hypothesis $H2_{B1}$: *TSES* by *Education* (Florida)

Outlier Labeling Rule	Q1	Mean	Q3	Range	g	Lower Bound	Upper Bound
HS Diploma or less	29.00	33.00	38.00	9.00	2.20	9.20	57.80
Some college up to AA/AS	28.00	32.00	37.00	9.00	2.20	8.20	56.80
Bachelor's Degree	29.00	33.00	39.00	10.00	2.20	7.00	61.00
Master's Degree	27.75	31.00	37.00	9.25	2.20	7.40	57.35
Doctoral Degree	27.75	32.00	37.00	9.25	2.20	7.40	57.35

Table C-12. Hypothesis $H2_{B2}$: *TSES* by *Education*

Outlier Labeling Rule	Q1	Mean	Q3	Range	g	Lower Bound	Upper Bound
HS Diploma or less	28.25	32.00	38.00	9.75	2.20	6.80	59.45
Some college up to AA/AS	28.00	32.00	37.00	9.00	2.20	8.20	56.80
Bachelor's Degree	28.00	32.00	38.00	10.00	2.20	6.00	60.00
Master's Degree	27.00	31.00	36.25	9.25	2.20	6.65	56.60
Doctoral Degree	28.00	31.50	36.75	8.75	2.20	8.75	56.00

Table C-13. Hypothesis $H2_{C1}$: *TSES* by *Income* (Florida)

Outlier Labeling Rule	Q1	Mean	Q3	Range	g	Lower Bound	Upper Bound
Up to $14,999	27.00	32.00	39.00	12.00	2.20	0.60	65.40
$15,000-$24,999	29.00	32.00	37.00	8.00	2.20	11.40	54.60
$25,000-$34,999	29.00	33.00	38.00	9.00	2.20	9.20	57.80
$35,000-$49,999	29.00	33.00	37.00	8.00	2.20	11.40	54.60
$50,000-$74,999	29.00	32.00	38.00	9.00	2.20	9.20	57.80
$75,000-$99,999	28.00	32.00	38.00	10.00	2.20	6.00	60.00
$100,000-$149,999	28.00	33.00	38.00	10.00	2.20	6.00	60.00
$150,000 or more	28.00	33.00	38.50	10.50	2.20	4.90	61.60

Table C-14. Hypothesis $H2_{C2}$: *TSES* by *Income*

Outlier Labeling Rule	Q1	Mean	Q3	Range	g	Lower Bound	Upper Bound
Up to $14,999	26.00	31.00	39.00	13.00	2.20	-2.60	67.60
$15,000-$24,999	29.00	32.00	37.00	8.00	2.20	11.40	54.60
$25,000-$34,999	29.00	33.00	38.00	9.00	2.20	9.20	57.80
$35,000-$49,999	28.00	33.00	37.00	9.00	2.20	8.20	56.80
$50,000-$74,999	28.00	32.00	37.00	9.00	2.20	8.20	56.80
$75,000-$99,999	28.00	32.00	38.00	10.00	2.20	6.00	60.00
$100,000-$149,999	28.00	32.00	37.00	9.00	2.20	8.20	56.80
$150,000 or more	28.00	32.00	37.00	9.00	2.20	8.20	56.80

Table C-15. Hypothesis $H2_{D1}$: *TSES* by *Age* (Florida)

Outlier Labeling Rule	Q1	Mean	Q3	Range	g	Lower Bound	Upper Bound
25-34 years	30.00	34.50	41.00	11.00	2.20	5.80	65.20
35-44 years	30.00	33.00	39.00	9.00	2.20	10.20	58.80
45-54 years	27.00	32.00	37.00	10.00	2.20	5.00	59.00
55-64 years	29.00	32.50	38.00	9.00	2.20	9.20	57.80
65-75 years	28.00	32.00	37.00	9.00	2.20	8.20	56.80

Table C-16. Hypothesis $H2_{D2}$: *TSES* by *Age*

Outlier Labeling Rule	Q1	Mean	Q3	Range	g	Lower Bound	Upper Bound
25-34 years	29.00	33.00	40.00	11.00	2.20	4.80	64.20
35-44 years	29.00	33.00	38.00	9.00	2.20	9.20	57.80
45-54 years	27.00	31.00	35.00	8.00	2.20	9.40	52.60
55-64 years	28.00	32.00	37.25	9.25	2.20	7.65	57.60
65-75 years	28.00	31.00	37.00	9.00	2.20	8.20	56.80

APPENDIX D
DETAIL OF HPKS SCORES BY TIME LIVING IN COMMUNITY

Table D-1. Descriptive statistics of *HPKS* scores by *Time Lived in Community*

					95% confidence interval for mean			
	N	Mean	Std. deviation	Std. error	Lower bound	Upper bound	Minimum	Maximum
Less than 6 months	25	36.92	12.17	2.43	31.90	41.94	6	57
6 months to 2 years	108	39.03	8.13	0.78	37.48	40.58	17	60
2-10 years	549	39.72	8.98	0.38	38.97	40.47	9	60
10-20 years	551	41.09	8.58	0.37	40.38	41.81	12	60
20-30 years	355	41.90	8.38	0.44	41.02	42.77	13	60
More than 30 years	355	41.97	9.14	0.48	41.02	42.92	12	60
Total	1943	40.84	8.85	0.20	40.45	41.24	6	60

The descriptive statistics of the *Hurricane-Preparedness Knowledge Scale (HPKS)* by *Time Lived in Community* is shown in Table D-1. For the test of this hypothesis, the dependent variable (DV) is the *HPKS* score and the independent variable (IV) is the *Time Lived in Community*. Homeowner responses were classified into six *Time Lived in Community* categories, and the mean *HPKS* scores increased in order from: *Less than 6 months* (n = 25, M = 36.92, SD = 12.17), to *6 months to 2 years* (n = 108, M = 39.03, SD = 8.13), to *2-10 years* (n = 549, M = 39.72, SD = 8.98), to *10-20 years* (n = 551, M = 41.09, SD = 8.58), to *20-30 years* (n = 355, M = 41.90, SD = 8.38), to *More than 30 years* (n = 355, M = 41.97, SD = 9.14) (Figure D-1).

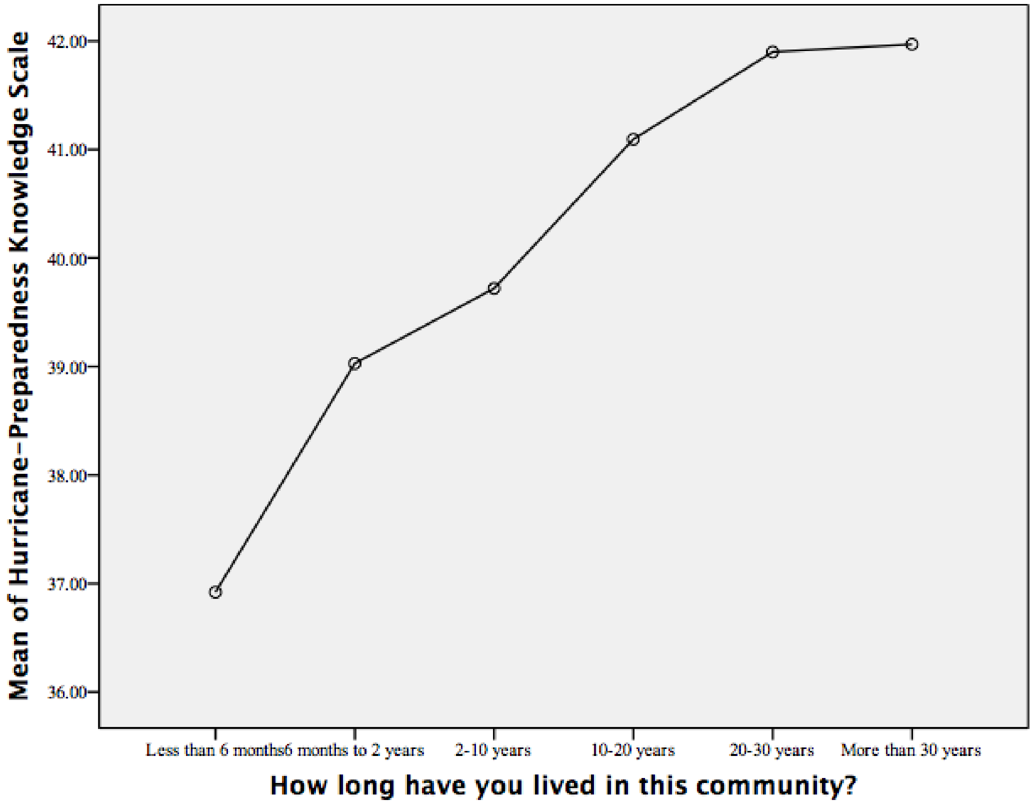

Figure D-1. Mean *HPKS* score by *Time Lived in Community*

For the one-way ANOVA, some assumptions must first be verified. The first three assumptions are based on the design of the study instrument. These assumptions are a) the dependent variable (DV) is continuous, b) the independent variable (IV) is categorical with two or more independent groups, and c) the cases (homeowner responses) are independent. All of these assumptions held true for this analysis. The last three assumptions are confirmed through statistical tests. The first of these remaining assumptions was d) no significant outliers in the IV groups in terms of the DV. Of the 1,943 homeowner responses, seven outliers were found by comparing the extreme values of each category to the range produced by the outlier labeling rule.

The *HPKS* score was significantly different for the different *length of time in community* categories, $F(5,1937) = 5.987$, $p < .001$. Tukey's post hoc analysis (Table D-

2) revealed that the mean *HPKS* score of homeowners living in the community *6 months to 2 years* (*M* = 39.03, *SD* = 8.13) and *2-10 years* (*M* = 39.72, *SD* = 8.98) were significantly lower than the mean scores of homeowners living in the community *20-30 years* (*M* = 33.76, *SD* = 7.44) and *More than 30 years* (*M* = 34.70, *SD* = 8.66).

Table D-2. Tukey's post hoc of *HPKS* scores by *Time Lived in Community*

						95% confidence interval	
	(I) Time Lived	(J) Time Lived	Mean difference (I-J)	Std. error	Sig.	Lower bound	Upper bound
Tukey HSD	Less than 6 months	6 months to 2 years	-2.11	1.95	0.889	-7.67	3.46
		2-10 years	-2.80	1.80	0.627	-7.93	2.33
		10-20 years	-4.17	1.80	0.186	-9.30	0.95
		20-30 years	-4.98	1.82	0.069	-10.17	0.21
		More than 30 years	-5.05	1.82	0.062	-10.24	0.14
	6 months to 2 years	Less than 6 months	2.11	1.95	0.889	-3.46	7.67
		2-10 years	-0.69	0.93	0.976	-3.33	1.95
		10-20 years	-2.07	0.93	0.223	-4.71	0.57
		20-30 years	*-2.87	0.97	0.036	-5.63	-0.11
		More than 30 years	*-2.94	0.97	0.029	-5.70	-0.19
	2-10 years	Less than 6 months	2.80	1.80	0.627	-2.33	7.93
		6 months to 2 years	0.69	0.93	0.976	-1.95	3.33
		10-20 years	-1.37	0.53	0.099	-2.89	0.14
		20-30 years	*-2.18	0.60	0.004	-3.89	-0.47
		More than 30 years	*-2.25	0.60	0.002	-3.96	-0.54
	10-20 years	Less than 6 months	4.17	1.80	0.186	-0.95	9.30
		6 months to 2 years	2.07	0.93	0.223	-0.57	4.71
		2-10 years	1.37	0.53	0.099	-0.14	2.89
		20-30 years	-0.80	0.60	0.760	-2.51	0.90
		More than 30 years	-0.87	0.60	0.689	-2.58	0.83
	20-30 years	Less than 6 months	4.98	1.82	0.069	-0.21	10.17
		6 months to 2 years	*2.87	0.97	0.036	0.11	5.63
		2-10 years	*2.18	0.60	0.004	0.47	3.89
		10-20 years	0.80	0.60	0.760	-0.90	2.51
		More than 30 years	-0.07	0.66	1.000	-1.95	1.81
	More than 30 years	Less than 6 months	5.05	1.82	0.062	-0.14	10.24
		6 months to 2 years	*2.94	0.97	0.029	0.19	5.70
		2-10 years	*2.25	0.60	0.002	0.54	3.96
		10-20 years	0.87	0.60	0.689	-0.83	2.58
		20-30 years	0.07	0.66	1.000	-1.81	1.95

* The mean difference is significant at the 0.05 level.

APPENDIX E
DETAIL OF HPKS SCORES BY MINORS IN HOUSEHOLD

Table E-1. Descriptive statistics of *HPKS* by *Minors* in household

		N	Mean	Std. deviation	Std. error mean
HPKS	No Minors	1355	40.52	8.63	0.23
	Minors Present	588	41.58	9.29	0.38
	Total	1943	40.84	8.85	0.20

The descriptive statistics of the *Hurricane-Preparedness Knowledge Scale (HPKS)* by *Minors in Household* are shown in Table E-1. For the test of this hypothesis, the dependent variable (DV) is the *HPKS* score and the independent variable (IV) is the *Minors in Household* variable. Homeowner responses were classified into two responses: *No Minors* (n = 1355, M = 40.52, SD = 8.63) and *Minors Present* (n = 588, M = 41.58, SD = 9.29), and their mean scores are in that order.

Independent-samples *t*-tests have similar assumptions to the one-way ANOVA that were detailed in the Results and Analysis of Data chapter, but with a few differences. The first assumption is that the DV is a continuous variable; HPKS is indeed continuous. The second assumption is that the IV is dichotomous. This analysis used the presence of minors in the household as the IV, and this variable was coded as *No Minors* and *Minors Present*. The next assumption is that of independent observations and the data collection method of the dataset used meets this assumption.

The next three assumptions relied on output from SPSS (v.22). Freedom from outliers was the next assumption and based on the outlier labeling rule there only existed one outlier. The next assumption was that the DV should be approximately normally distributed in each group of the IV. The Shapiro-Wilk test for normality was significant at the $p < .001$ value for both groups, thus indicating normality. The last assumption is homogeneity of variance between groups. The assumption of homogeneity of variances was violated, as assessed by Levene's test for equality of variances (*p* = .013).

Given this violation of assumption, the *t*-test for equality of means values were gathered from the second row of values, or the values for equal variances not assumed. The mean *HPKS* score of households with *Minors Present* was 1.06, 95% CI [0.18 to 1.94] higher than the mean *HPKS* score of households with *No Minors*. This difference was statistically significant, *t*(1046) = -2.36, *p* = .018.

Table E-2. Independent samples test of *HPKS* by *Minors*

		Levene's test for equality of variances		t-test for equality of means					95% confidence interval of the difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	Lower	Upper
HPKS	Equal variances assumed	6.23	0.013	2.43	1941.00	0.015	1.06	0.44	0.20	1.92
	Equal variances not assumed			2.36	1046.00	0.018	1.06	0.45	0.18	1.94

APPENDIX F
RESEARCH ROADMAP

Research Questions	Hypotheses	Items	Type of Analysis	Variables
RQ1: To what extent can demographic characteristics (*location, education, income*, and *age*) predict homeowners' self-reported score on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)*?				
RQ1$_A$: To what extent can the *location* of homeowners affect their self-reported score on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)*?	**H1$_{A1}$**: Homeowners located in the counties of Florida's *Panhandle* will self-report <u>lower</u> scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other regions within the state.	FLReg[1] (Northwest, Panhandle, North, East Coast, West Coast, and South Florida) 4.22, 4.23, 4.30, 4.39, 4.40, 4.45, 4.52 (HPKS variables)	One-way between groups ANOVA or Welch's t-test	IV: FLReg[1] DV: HPKS
	H1$_{A2}$: Homeowners located in *Georgia* will self-report <u>lower</u> scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other *States* within the study area.	States_v2[2] (Alabama and Mississippi are combined due to low responses) 4.22, 4.23, 4.30, 4.39, 4.40, 4.45, 4.52 (HPKS variables)	One-way between groups ANOVA or Welch's t-test	IV: States_v2[2] DV: HPKS
RQ1$_B$: To what extent can homeowners' *Education Level* affect their self-reported score on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)*?	**H1$_{B1}$:** Florida homeowners attaining *less than a bachelor's degree* will self-report <u>lower</u> scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners within the state.	Education (limited to Florida) 4.22, 4.23, 4.30, 4.39, 4.40, 4.45, 4.52 (HPKS variables)	One-way between groups ANOVA or Welch's t-test	IV: Education DV: HPKS

1 The "FLReg" variable divides the state of Florida area into six regions: Northwest Florida, Florida Panhandle, North Florida, East Coast of Florida, West Coast of Florida, & South Florida. (Community Collaborative Rain, Hail & Snow Network, 2014)
2 The "States_v2" variable divides the study area into four states and one region consisting of two states of low response: Texas, Louisiana, Georgia, Florida, and Alabama/Mississippi.

Research Questions	Hypotheses	Items	Type of Analysis	Variables
	H1$_{B2}$: Homeowners from across the study area attaining *less than a bachelor's degree* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners.	Education 4.22, 4.23, 4.30, 4.39, 4.40, 4.45, 4.52 (HPKS variables)	One-way between groups ANOVA or Welch's t-test	IV: Education DV: HPKS
RQ1$_C$: To what extent can *household income* level affect homeowners' self-reported score on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)*?	**H1$_{C1}$:** Florida homeowners with *lower levels of household income* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners within the state.	Income (limited to Florida) 4.22, 4.23, 4.30, 4.39, 4.40, 4.45, 4.52 (HPKS variables)	One-way between groups ANOVA or Welch's t-test	IV: Income DV: HPKS
	H1$_{C2}$: Homeowners from across the study area with *lower levels of household income* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners.	Income 4.22, 4.23, 4.30, 4.39, 4.40, 4.45, 4.52 (HPKS variables)	One-way between groups ANOVA or Welch's t-test	IV: Income DV: HPKS
RQ1$_D$: To what extent can homeowners' *age* affect their self-reported score on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)*?	**H1$_{D1}$:** Florida homeowners who are *younger* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners within the state.	Age (limited to Florida) 4.22, 4.23, 4.30, 4.39, 4.40, 4.45, 4.52 (HPKS variables)	One-way between groups ANOVA or Welch's t-test	IV: Age DV: HPKS

Research Questions	Hypotheses	Items	Type of Analysis	Variables
	$H1_{D2}$: Homeowners from across the study area who are *younger* will self-report lower scores on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)* than other homeowners.	Age 4.22, 4.23, 4.30, 4.39, 4.40, 4.45, 4.52 (HPKS variables)	One-way between groups ANOVA or Welch's t-test	IV: Age DV: HPKS
RQ1: To what extent can demographic characteristics (*location, education, income*, and *age*) predict homeowners' self-reported score on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)*?	**Florida Specific Multiple Regression Model**	FLReg, Education, Income, Age (limited to Florida) 4.22, 4.23, 4.30, 4.39, 4.40, 4.45, 4.52 (HPKS variables)	Multiple Regression Modeling	IV: FLReg[1], Education, Income, Age DV: HPKS
RQ1: To what extent can demographic characteristics (*location, education, income*, and *age*) predict homeowners' self-reported score on this study's *Hurricane-Preparedness Knowledge Scale (HPKS)*?	**Study Area Multiple Regression Model**	States_v2, Education, Income, Age 4.22, 4.23, 4.30, 4.39, 4.40, 4.45, 4.52 (HPKS variables)	Multiple Regression Modeling	IV: States_v2, Education, Income, Age DV: HPKS

1 The "FLReg" variable divides the state of Florida area into six regions: Northwest Florida, Florida Panhandle, North Florida, East Coast of Florida, West Coast of Florida, & South Florida. (Community Collaborative Rain, Hail & Snow Network, 2014)

Research Questions	Hypotheses	Items	Type of Analysis	Variables
RQ2: To what extent can demographic characteristics (*location, education, income*, and *age*) affect homeowners' self-reported score on this study's *Trust in Support Entities Scale (TSES)*?				
RQ2$_A$: To what extent can the *location* of homeowners affect their self-reported score on this study's *Trust in Support Entities Scale (TSES)*?	**H2$_{A1}$:** Homeowners located in the counties of *Florida's Panhandle* will self-report <u>lower</u> scores on this study's *Trust in Support Entities Scale (TSES)* than other regions within the state.	FLReg[1] (Northwest, Panhandle, North, East Coast, West Coast, and South Florida) 4.15, 4.26, 4.27, 4.14, & 4.16 TSES variables	One-way between groups ANOVA or Welch's t-test	IV: FLReg[1] DV: TSES
	H2$_{A2}$: Homeowners located in *Louisiana* will self-report <u>lower</u> scores on this study's *Trust in Support Entities Scale (TSES)* than other states within the study area.	States_v2[2] (Alabama and Mississippi are combined due to low responses) 4.15, 4.26, 4.27, 4.14, & 4.16 TSES variables	One-way between groups ANOVA or Welch's t-test	IV: States_v2[2] DV: TSES
RQ2$_B$: To what extent can homeowners' level of *educational attainment* affect their self-reported score on this study's *Trust in Support Entities Scale (TSES)*?	**H2$_{B1}$:** Florida homeowners holding *less than a bachelor's degree* will self-report <u>lower</u> scores on this study's *Trust in Support Entities Scale (TSES)* than other homeowners within the state.	Education (limited to Florida) 4.15, 4.26, 4.27, 4.14, & 4.16 TSES variables	One-way between groups ANOVA or Welch's t-test	IV:Education DV: TSES
	H2$_{B2}$: Homeowners from across the study area holding *less than a bachelor's degree* will self-report <u>lower</u> scores on this study's *Trust in Support Entities Scale (TSES)*.	Education 4.15, 4.26, 4.27, 4.14, & 4.16 TSES variables	One-way between groups ANOVA or Welch's t-test	IV:Education DV: TSES

1 The "FLReg" variable divides the state of Florida area into six regions: Northwest Florida, Florida Panhandle, North Florida, East Coast of Florida, West Coast of Florida, & South Florida. (Community Collaborative Rain, Hail & Snow Network, 2014)
2 The "States_v2" variable divides the study area into five regions: Texas, Louisiana, Georgia, Florida, and Alabama/Mississippi.

Research Questions	Hypotheses	Items	Type of Analysis	Variables
RQ2$_C$: To what extent can *Household Income* affect homeowners' self-reported score on this study's *Trust in Support Entities Scale (TSES)*?	**H2$_{C1}$:** Florida homeowners with *lower levels of household income* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other homeowners within the state.	Income (limited to Florida) 4.15, 4.26, 4.27, 4.14, & 4.16 TSES variables	One-way between groups ANOVA or Welch's t-test	IV: Income DV: TSES
	H2$_{C2}$: Homeowners from across the study area with *lower levels of household income* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other homeowners.	Income 4.15, 4.26, 4.27, 4.14, & 4.16 TSES variables	One-way between groups ANOVA or Welch's t-test	IV: Income DV: TSES
RQ2$_D$: To what extent can homeowners' *Age* affect their self-reported score on this study's *Trust in Support Entities Scale (TSES)*?	**H2$_{D1}$:** Florida homeowners who are *younger* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other homeowners within the state.	Age (limited to Florida) 4.15, 4.26, 4.27, 4.14, & 4.16 TSES variables	One-way between groups ANOVA or Welch's t-test	IV: Age DVs: TSES
	H1$_{D2}$: Homeowners from across the study area who are *younger* will self-report lower scores on this study's *Trust in Support Entities Scale (TSES)* than other homeowners.	Age 4.15, 4.26, 4.27, 4.14, & 4.16 TSES variables	One-way between groups ANOVA or Welch's t-test	IV: Age DVs: TSES

Research Questions	**Hypotheses**	Items	Type of Analysis	Variables
RQ1: To what extent can demographic characteristics (*location, education, income*, and *age*) affect homeowners' self-reported score on this study's *Trust in Support Entities Scale (TSES)*?	**Florida Specific Multiple Regression Model**	FLReg, Education, Income, Age (limited to Florida) 4.15, 4.26, 4.27, 4.14, & 4.16 TSES variables	Multiple Regression Modeling	IV: FLReg, Education, Income, Age DV: TSES
RQ1: To what extent can demographic characteristics (*location, education, income*, and *age*) affect homeowners' self-reported score on this study's *Trust in Support Entities Scale (TSES)*?	**Study Area Multiple Regression Model**	States_v2, Education, Income, Age 4.15, 4.26, 4.27, 4.14, & 4.16 TSES variables	Multiple Regression Modeling	IV: States_v2, Education, Income, Age DV: TSES

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BIOGRAPHICAL SKETCH

Charles Bradford Sewell attended the public schools of New Castle, Indiana. Immediately following high school, Brad attended Purdue University majoring in electrical engineering technology. After two unsuccessful semesters, he left Purdue and entered the workforce. After a few general labor jobs, Brad was hired as a retail assistant manager. At this time, he registered at Ivy Tech Community College of Indiana in Lafayette, Indiana and majored in computer-aided design. Family obligations did not allow for the completion of Brad's studies, and he entered the field of hospitality management.

After 13 years in management, Brad was laid off and made the decision to return to Edison State College (currently Southwestern Florida State College) in the spring of 2010 to complete his education. While at Edison, Brad earned an Associate of Arts degree and an Associate of Science in design and drafting. In the fall of 2011, Brad transferred to the University of Florida. Due to Brad's academic accomplishments, grade point average, and honors thesis, he was selected as one of two outstanding two-year scholars for the fall 2013 commencement. At this time Brad graduated Summa Cum Laude with a Bachelor of Science in sustainability and the built environment with a minor in urban and regional planning.

As a graduate student, Brad studied community development and his research interest in homeowner perceptions and behavior led to his co-developing of Decision-Ade™, a process for segmenting US homeowners. In December of 2015 Brad earned a Master of Science in family, youth and community sciences with a minor in entrepreneurship and a graduate certificate in geospatial analysis.