

THE WILLINGNESS OF OLDER ADULTS TO EVACUATE
IN THE EVENT OF A DISASTER

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This study examined the level of willingness to evacuate among older adults in the event of a disaster. Since 1900, the number of Americans 65 and older has increased 12 times (from 3.1 million to 36.3 million). During the next two decades, the number of American baby boomers, now aged 45-64, who turn 65, will increase by 40%. Despite the extensive literature on disasters and evacuation, some significant questions regarding evacuation and older adults have not been addressed.

The sample population consisted of 765 voluntary participants aged 60 years and older from thirty senior/community centers within seven counties in the State of Oklahoma. A group administered survey (the Disaster Evacuation Survey) included a total of 15 questions. The study revealed the following findings: older adults are more likely to comply with a mandatory evacuation order. Individuals with college degrees are more likely to comply with mandatory evacuations. African Americans are more likely to comply with a voluntary request. American Indian/Alaskan Native are more likely to comply with mandatory evacuation orders from emergency officials. Important practical implications for emergency officials responding to vulnerable older adults in disaster situations are also provided.

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CHAPTER 1

OVERVIEW

Introduction

This chapter provides an outline of the significant rise in the number of disasters. Along with the significant rise in disasters, this chapter presents statistics on the considerable growing number of older adults. In addition, flawed disaster evacuations that have occurred in the United States continue to reveal evacuation vulnerabilities.

A Rise in Disasters: A Global Perspective

Disasters can strike anywhere at any time, vary in severity, and have devastating consequences that may result in injuries or loss of life for those individuals who are ill-prepared for disaster situations. According to Perry and Lindell (1997), disasters are a significant cause of death and disability around the world and also have tremendous social, economic, and political effects on society. There are accurate records of 21 fiscal years from July 1, 1920, through June 30, 1941, from which to draw conclusions. During the first five years of that period, the number of disasters in which relief was extended averaged only 71 annually. In the last five-year of that period, there was an average of 128 disasters that required relief efforts. The increase can somewhat be attributed to a greater alertness to need and also the increased changes in the population density, but the primary reason for the 80% change was due to the increase incidence of disasters (Smith, 2005).

Since the close of World War II, no state has been immune from disaster. During the 1960s, events totaled only 89 per year. By the 1990s, annual disasters had risen to

392, an increase of more than 400%. In the first half of 2005, there were 174 natural disasters affecting 86 countries, resulting in the deaths of 5,967 people, affecting a total of 60 million people with an estimated damage of \$6.3 billion (Centre for Research on the Epidemiology of Disasters [CRED]. (2007). Figure 1 illustrates the growth in the number of disasters worldwide. In the last 25 years, the U.S. has been subject to 442 natural disasters and 902 disaster declarations (CRED, 2007).

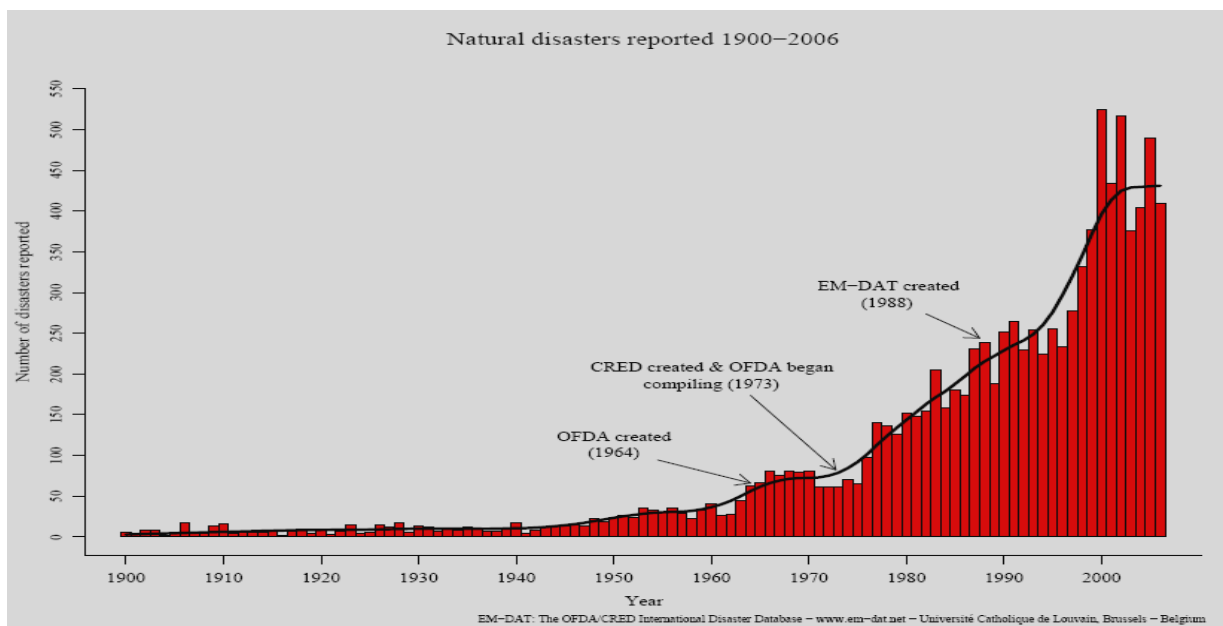


Figure 1. The increase of worldwide reported natural disasters.

In the United States, disasters are more frequent and more varied than in any other country; almost every type of disaster occurs here (Smith, 2005). In addition to natural disasters, the U.S. has also added acts of terrorism to the list of emergencies and disasters, and protecting the health of the public has also become more urgent since September 11, 2001 (Hodge & Gostin, 2003). The increase in the amount of disasters has had profound and far-reaching effects on American citizens, and researchers have begun to document these effects on various segments of the U.S.

population. Table 1 illustrates the types of disasters that have occurred and could occur.

Table 1

The Types of Disasters That Have Occurred and Could Occur

	Man-Made technological	Man-made biological	Naturally occurring biodisaster	Natural disaster
Unintentional	Has-mat, nuclear power plant accident, Bhopal	Food borne, and other biological or viral illness due to lack of infection control	Epidemic & pandemics	Floods, tsunamis, hurricanes, earthquakes, etc.
Intentional	Chemical, nuclear, radiological, explosion, acts of terrorism, and conventional warfare	Bioterrorism		

The Increasing Number of Older Adults in the United States

Since 1900, the number of Americans 65 and older has increased almost 12 times (from 3.1 million to 36.3 million). The percentage of Americans 65 years of age or older has more than tripled from 4.1% in 1900 to 12.4% in 2004. In 2005, the 65-74 years of age group (18.6 million) was more than 8.5 times larger than in 1900, but the 75-84 years of age group (13.1 million) was 17 times larger, and the 85 years and older group (5.1 million) was 42 times larger. Older adults represent 12.4% of the U.S. population, about one in every eight Americans (AoA, 2006). The number of older Americans has increased by 3.2 million or 9.4% since 1995, compared to an increase of 13.3% for the under 65 population. In addition, Baby Boomers, the number of Americans born in the years 1946 through 1964, who will reach the age of 65 over the next two decades, will increase by 40%.

In addition, 54.5% of adults aged 65 or older report having some type of disability (US Census Bureau, 2001a) and 20.4 report having difficulty going outside their home (Waldrop & Stern, 2003). Approximately 32% of US adults aged 70 or older indicate that they have difficulty with the daily task of walking (McGuire, Ford & Ajani, 2006). The degree and severity of walking disability varies with 3.8% of US adults aged 65 and older reporting the use of a wheelchair and 13.0% highlighting the use of a cane, crutches or walker (US Census Bureau, 2001b).

Flawed Disaster Evacuations in the United States

The following is an overview of flawed disaster evacuations in the United States.

Northridge Earthquake

When the 1994 Northridge earthquake struck and caused extensive damage, a high percentage of mobile parks housed older adults. This earthquake exposed many flaws in the disaster response plan as many of the victims were older persons with disabilities (California Service Corp, 2006). Despite California's expanded role in serving vulnerable populations, older adults were overlooked and generally are not incorporated into the disaster evacuation plans.

9/11

In the terrorist attack on September 2001, there were 6300 seniors living in the immediate area and nearly 19,000 living within a three-block radius of the World Trade Center and the impact of this disaster was immediate and very personal. Emergency workers believed the buildings had all been evacuated, but disabled people who were

unable to leave their apartments were left behind with no electricity (and therefore no television, radio, lights, elevators, refrigerators, etc.), no running water, and no information about what was happening and what they should do. Home health aides were unable to check on whether or not their patients had been rescued. Within 24 hours following the 9/11 terrorist attacks, animal advocates were on the scene rescuing pets, yet abandoned older and disabled people waited for up to seven days for an ad hoc medical team to rescue them (O'Brien, 2003).

Hurricane Katrina

As Hurricane Katrina in 2005 made painfully clear, older adults are among the most vulnerable when disaster strikes. In the destruction of Hurricane Katrina, more than 70% of those who died were older adults, many of whom refused or were unable to evacuate. When Hurricane Katrina ravaged the city of New Orleans, many older adults were left to fend for themselves, some went without prescribed medications, most went without proper food and fluids for days and even weeks; and others were exposed to the harsh elements (McGuire, Ford, & Okoro, 2007).

Purpose of Study

Given the rise of disasters, prior evacuation problems, and the increasing number of older adults, more research studies are considered necessary to improve conditions and minimize the risks that older adults may face in the event of a disaster. This study was designed to examine community-dwelling older adults' level of willingness to evacuate in the event of a disaster. The research literature on older adults

and disasters has focused attention on the needs of older persons adversely affected by disasters, but little attention has been focused on the willingness among older adults with regard to disaster evacuation. This research study strived to provide a better understanding of the factors affecting the level of willingness among the older population to comply with evacuation orders in the event of a disaster. Such understanding should contribute to the identification of ways for emergency government officials and mass media to influence and enhance their relationship within the community, and ultimately increase the level of willingness and trust among the older population in the event of a disaster.

Research Problem Statement

This study examined older adults' level of willingness to comply with evacuation orders given by emergency government officials and mass media in the event of a disaster. This was accomplished by using a survey instrument that measured older adults' level of willingness to evacuate when given either a voluntary request or a mandatory evacuation order.

Research Questions

Despite the extensive literature on disasters and evacuation, some significant questions regarding the level of willingness to evacuate among older adults have not been addressed. This paper will address the following concerns:

1. What is the level of willingness among older adults to evacuate from their homes when asked to do so by mass media and/or emergency management officials?

2. Does an evacuation's being mandatory versus voluntary influence the level of willingness to evacuate among older adults? (I will comply with a mandatory evacuation order? I will comply with a voluntary evacuation request?)
3. Do preconditions (Gender, Marital Status, Age, Ethnic Origin, Education Levels, Level of Preparedness, Prior evacuation, and Geographical Location) influence the level of willingness to evacuate among older adults?

Summary

In summary, considering the increased number of disasters and the increasing population of older adults, further research must be done to improve the lives of older Americans. Even with the destruction of Hurricane Katrina in 2005, the imperfections and vulnerabilities of flawed evacuations for older adults are still present. These major disasters that have occurred have illustrated the importance of preparedness and evacuation (McGuire et al., 2007).

CHAPTER 2

REVIEW OF LITERATURE

Introduction

In this chapter, a review of literature regarding perceptions of disaster evacuations and individual's decision-making process are presented. This chapter also examines literature of older adults and their trust with emergency management officials and mass media. This chapter addresses the review of literature concerning the impact of disaster vulnerabilities among older adults. In addition, the psychosocial phases of disasters are also addressed to establish the relationship among disasters and how disasters may affect older adults.

Perceptions of Disaster Evacuations

Disaster Evacuations are more common than many people realize. Hundreds of times each year, transportation and industrial accidents release harmful substances, forcing thousands of people to leave their homes. Fires and floods cause evacuations even more frequently (FEMA, 2008).

Evacuation research has consistently revealed that people are most likely to take protective action if they perceive a real threat to themselves and their loved ones (Baker 1991; Drabek 1999; Fitzpatrick & Mileti 1991, & Perry 1979). Riad, Norris, and Ruback (1999) determined that risk perception, access to resources, and social influence were the most important influences on evacuation decisions. Evacuation information is critically important in the decision-making process of most Americans when faced with the possibility of a life-threatening situation (Fitzpatrick & Mileti 1991; Perry & Lindell 1991; Quarantelli 1980, & Seydlitz, Spencer, & Lundskow 1994). In addition,

Quarantelli (1980) stated the credibility, frequency, and specificity of warning messages were important factors when individuals synthesize information to determine whether to stay or leave the at-risk disaster area.

Among older adults, trust and confidence in emergency officials and the media are the best predictors of future willingness to evacuate (Rosenkoetter, et al., 2007). When emergency officials are perceived as dedicated and caring about the health and well being of the public, levels of public trust are likely to be higher (Peters, Covello, & McCallum, 1997; Wray, Ricardo, Kreuter, Jacobsen, Clements, & Evans, 2004). One way individuals cope with this lack of knowledge is to rely on social trust to reduce the complexity they are faced with (Siegrist & Cvetkovich, 2000). Effective communication among the general public is a critical component of emergency response in a disaster situation. Trust, especially in the absence of knowledge, is the essential key to effective communication (Wray et al., 2004, Earle & Cvetkovich, 1995; Luhmann, 1989).

Literature on Evacuations among Older Adults and Preconditions

There have been numerous studies regarding disaster evacuations. However, the impact of disaster evacuation on older adults has received limited attention in the literature. There are conflicting findings among these studies; some characterized older adults as noncompliant and less likely to cooperate with authorities (Cohen & Poulshock, 1988; Perry & Lindell, 1997). While other studies find older adults to be no different or more likely to comply with emergency officials (Perry & Lindell, 1997).

The following preconditions were examined in previous studies:

Age

A number of studies have found older adults to have lower evacuation rates than younger adults (Drabek 1986; Gladwin & Peacock 1997; Wilmot & Mei 2004). However, some studies have found no statistical significant between the age of the warning recipient and their subsequent level of warning compliance (Perry & Lindell, 1997; Zhang et al. 2004).

Gender

Ollenburger and Tobin (1999) found that gender played a significant role in responses to natural disasters and that women exhibited greater stress than men following the Des Moines flood of 1993. A number of studies have found that evacuation rates are higher for women than for men (Bateman & Edwards 2002; Drabek 1986; Riad et al. 1999; Whitehead et al., 2000). However, not all studies have found statistical significance between older men and women (Zhang et al., 2004).

Marital Status

After Hurricane Andrew and the Red River Valley Flood, Enarson (1999) noted that women experienced conflict with men over evacuation. Older adults requiring the use of special equipment during a disaster were more likely to be white unmarried females (McGuire et al., 2007).

Ethnic Origin

African American and other minority older adults are often the victims of forced

evacuation, particularly those older adults who live in the urban areas. Skinner (1992) suggested that because of the history of discrimination and the nature of ageism in this country, many African American older adults have been *aging in place* without having the choice about where they will move in the future; instead the decision is either made for them or they have limited formal support systems available to assist them with the aging process. The empirical evidence regarding minorities is mixed. Some studies have found lower evacuation rates among minorities (Gladwin & Peacock 1997), some studies have found lower rates for some minorities but not for others (Riad et al. 1999), and some other studies have found no statistical significance (Bateman & Edwards 2002).

Level of Education

The relationship between education and impact recovery is less well understood, but can safely be assumed that higher education levels can lead to better employment opportunities, even in a depressed post disaster situation, as well as greater proficiency in gaining access to assistance programs. The level of education and skills possessed by the adults in a household can significantly influence their resiliency (Morrow, 1999). However, some studies have found that education has no statistical significance on evacuation rates (Bateman & Edwards 2002; Gladwin & Peacock 1997; Whitehead et al., 2000).

Vulnerabilities of Older Adults in Disasters

Age does not necessarily make a person vulnerable in the event of a disaster. Rather, it is the correlation between advancing age and the likelihood of having special

needs that increases frailty or vice versa. It has become increasingly important to address the needs of the elderly prior to a catastrophic emergency because of the size and diversity of this population. For the millions of older adults who have physical and/or mental disabilities, facing catastrophic events presents real challenges. The differences that are unique to elderly and special populations must be addressed in order to alleviate the effects of such catastrophes and also aid in efficient and effective evacuation.

Older adults with serious physical, cognitive, or psychosocial problems can become even more vulnerable in the event of a disaster. Those least able to recover from a disaster are often the most vulnerable and least likely to receive assistance (DeWolfe, 2000; Fernández et al., 2002). McGuire et al., (2007) mentioned that preparing for impending natural disasters requires advanced planning and preparation, which is especially crucial to the survival, safe evacuation, and shelter of older adults, particularly those with disabilities or severe limitations.

Older adults are more likely to have co-morbid chronic conditions that make them more susceptible, vulnerable, and/or hinder recovery (Salerno & Nagy, 2002). A compromised immune system makes elders more susceptible to stress, no matter what the source (Barakat, Quentzel, Jernigan, Kirschke, Griffith, Spear, Kelley, Harden, Mayo, Stephens, Popovic, Murson, Zaki, Guarner, Shieh, Carver, Meyer, Sweedlow, Must & Hadler, 2002; Bradley, 1999; Helget & Smith, 2002; Katz et al., 2004; Madjid & Casscells, 2004; Salerno & Nagy, 2002).

Physiologically atypical presentation of disease is a classic hallmark of illness in the elderly because every major organ system may demonstrate age-related changes

that confound diagnosis, hamper rescue, or enhance vulnerability. Even the presentation of common illness in the elderly, such as community-acquired pneumonia, often is atypical. Other co-morbid conditions, such as cognitive impairment, cardiovascular disease, and hematological alterations may further predispose individuals to adverse outcomes (Romero-Steiner, Musher, Cetron, Pais, Groover, Fiore, Plikaytis, & Carlone, 1999). Although infectious disease generally is not one of the leading causes of death among the young, it accounts for 40% of deaths among the elderly (Morens, Folkers, & Fauci, 2004). While physical needs of older adults have been presented, further understanding of the impact of disasters, the psychosocial needs should also be addressed.

Psychosocial Phases of Disasters: Impact on Older Adults

Along with vulnerabilities of older adults, disasters may vary in terms of intensity and origin; they tend to follow certain patterns in terms of emotional reactions of affected persons. If its intensity can be reduced, a disaster becomes less severe and thus less traumatic, disruptive and damaging. A first step toward reducing intensity is to better understand how the different facets of a disaster relate with older adults. The following chart (figure 2) illustrates the psychosocial phases of disasters. In each phase, the implications for the older adult population are discussed (National Institute of Mental Health [NIMH], 1983):

Phases of Disaster

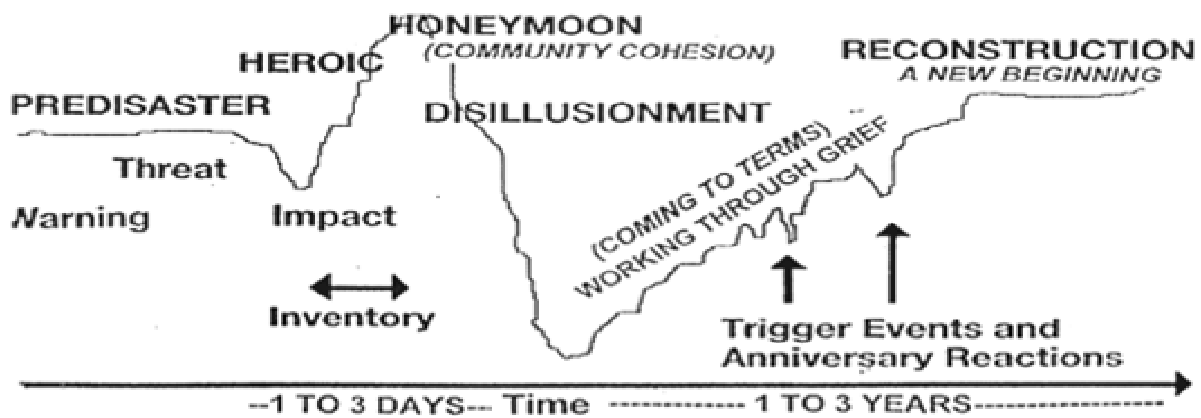


Figure 2. The psychosocial phases of disasters. (National Institute of Mental Health [NIMH], 1983)

Warning and Threat Phase

The warning disaster survivors and communities receive before impact varies by disaster type. Earthquakes tend to strike without warning and the aftershocks intensify the shock and despair. Hurricanes can be unpredictable and change course just before reaching land. Tornadoes are often detected in the early stages, but exactly where they will touch down is unpredictable. In contrast, disaster survivors may receive ample warning of pending floods and storms. When there is sufficient warning, evacuation and preparedness activities may create anxiety for older adults with limited mobility or available transportation. Other older adults may respond slowly to calls for disaster assistance and relief for reasons including age-related slowing of cognitive and motor activity.

Impact Phase

Reactions to the impact of the disaster depend on warning and preparedness activities, the level of destruction, and the success of the local and state emergency response. The responses of this phase range from confusion and disbelief to action, but panic is rarely expressed. For the senior population, responses might be partly due to medications being used, which can cause confusion or a greater susceptibility to problems such as dehydration.

Rescue or Heroic Phase

At the time of disaster and soon after, people who have experienced the unexpected and traumatic work together to save lives and property, and they have experienced the possibility of death, intensifying concern about the fate of others; still, additional trauma might come. Excitement and anticipation are likely to be high. This phase, however, is also likely to be a time of shock or denial, shielding the person from intense emotions. For those who have not lost loved ones, it might be a period of euphoria or boundless altruism. In either case, it is hardly a time for counselors to probe for more deep-rooted emotional response to trauma (Center for Mental Health Services [CMHS], 1994). The heroic phase should include mobilization of workers and volunteers needed for outreach to older persons who, for one reason or another, might not be able to make their way to shelters.

Remedy or Honeymoon Phase

For a brief time, perhaps one week to several months, those who have experienced disaster are likely to share feelings of common purpose and mutual support engendered at least in part by public and private response to their needs. They foresee early return to *normal*, even as they more fully assess the damage done to property and living patterns. The intense attachment to specific property items often adds to tensions for older adults.

Inventory Phase

This inventory phase is likely to be a time when disaster survivors are more interested in discussing their thoughts about details of the event rather than exploring their feelings (CMHS, 1994). It should be remembered that older persons are likely to be deeply affected by the loss of property, including homes, treasured possessions, and means of mobility.

Disillusionment Phase

Disillusionment can set in within several months or even after a year or more, and it is likely to be especially intense among elders who feel they have not fared well in dealing with official attempts to help them. Troubled outlooks might be caused by snags in official disaster response, mistrust caused by perceived unevenness of relief, and a feeling that those affected by the disaster are *on their own* even before fundamental problems have been dealt with. Victims are likely to put their individual needs first as they seek to resume *everyday* life. Counselors seeking to help them may find it an

appropriate time to listen carefully to their accounts of frustration and experiences (CMHS, 1994). The elderly might be severely impacted because of the unwillingness to accept *welfare*. Older adults are also reluctant to admit to mental health problems because of the perceived stigma they might attribute to mental health care, and might fear they will be transferred to a nursing home if their problems become known.

Reconstruction or Recovery Phase

Though support systems might have helped survivors cope with the most immediate needs and emotional responses, eventually victims are likely to recognize they will have to take the lead in rebuilding homes, businesses, and life patterns. Many older persons might regard these tasks as too formidable or useless to be taken on. This frustration often expressed by older persons when told of complex procedures needed to qualify for federal or state disaster relief assistance. Prolonged feelings of this kind can lead to apathy and even depression.

Negative consequences during this reconstruction phase, can be countered in part by disaster *anniversary* observances at which older adults can vent negative expressions or other observations.

Summary

As the size of the older population increases, it has become increasingly important to understand the vulnerabilities of older adults before, during, and after a disaster. Many older adults have vulnerabilities that limit their physical mobility, diminished sensory awareness, chronic health conditions, and social and economic

problems (Fernandez, Byard, Lin, Benson, & Barbera, 2002) that prevent taking appropriate actions. In order to be able to respond to emergencies caused by hazards, communities must meet evacuation needs of older adults by decreasing disaster vulnerability, developing response plans, providing Gerontological training for emergency officials, and arranging the necessary emergency equipment in the event of a disaster (Bissell, Pinet, Nelson, & Levy, 2004). In summary, older adults are more likely to follow instructions given by someone they trust (Shore 2003).

CHAPTER 3

METHODOLOGY

Introduction

This chapter presents an overview of the research design, participants in the study, methods of data collection, the use of an expert panel and pilot study, protection of human subjects, and also the survey instrument used.

Significant Disaster Events of Oklahoma

Significant disasters that have occurred in the State of Oklahoma include the following: tornadoes, ice storms, flooding, and wildfires.

Tornadoes

In the United States, tornadoes are among the most deadly of all natural disasters, causing 735 deaths from 1985 through 1998 (Lott, McCown, & Ross, 2000). The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more. Damage paths can be in excess of one mile wide and 50 miles long (NOAA, FEMA, American Red Cross, 1995). Although tornadoes occur in many parts of the world, these destructive forces of nature are found most frequently in the U.S. east of the Rocky Mountains during the spring and summer months. Known as tornado alley, the areas of the U.S. in which tornadoes are most frequent (Cappella, 2005).

Historically, Midwestern and south-central states, including Oklahoma, Indiana, Iowa, Mississippi, Alabama, Arkansas, Louisiana, Illinois, and Kansas, have had a higher concentration of strong and violent tornadoes (F2–F5) than any other region in

the U.S. During the period 1950–1995, Oklahoma experienced an average of 2.4 strong-to-violent tornadoes per 10,000 square miles (16,000 km²)—the highest concentration among all of the states (Lott et al., 2000).

According to Report 342 by FEMA (1999), during the late afternoon and evening of Monday, May 3, 1999, an outbreak of more than 70 tornadoes struck Oklahoma and southern Kansas and destroyed densely populated communities in and around the Oklahoma City metropolitan area. This is the deadliest of tornadoes in decades which ripped across the state killing at least 44 people while demolishing entire neighborhoods and also causing at least 500 million in damage to homes and businesses (Capella, 2005).

Ice Storms

According to McManus (2002), freezing rain is certainly not uncommon in Oklahoma. Almost every winter storm that visits the state leaves a bit of ice as a calling card, along with the obligatory snow and sleet. Oklahoma has suffered many ice storms, some more notable than others.

In 2001, the ice storm pounded the state for a little more than 24 hours, but its impact was felt for quite sometime. The storm left over a quarter-million people without electricity and in excess of \$100 million dollars in damages, prompting the federal government to declare over half of the counties in Oklahoma as disaster areas. A week after the icy storm exited the state, 39,000 Oklahoma residents were still in the dark (McManus, 2002).

Flooding

Just recently, flooding prompted a state of emergency to be issued for 24

counties in Oklahoma in mid 2007. During the flooding six people were killed, including an elderly Lincoln County man who drowned on a rain swollen roadway as a new round of thunderstorm dropped more rain on parts of the state already saturated by weeks of rainfall (The Joplin Globe, 2007).

Wildfires

During the Christmas holiday in 2005, a series of winter wildfires raged through parts of Oklahoma burning thousands of acres and hundreds of homes. At least four deaths have been attributed to the blazes that began over the weekend, several Oklahoma firefighters from nine rural fire departments worked to extinguish a wildfire near Carney in Lincoln County, saving a dozen mobile homes (Simmons, 2005).

Statistics of Older Adults in Oklahoma

With these significant disasters that have struck the State of Oklahoma and the rise in the number of disasters, the vulnerabilities of older adults have become even more substantial. According to the United States Census Bureau, the 2006 American Community Survey reported that older adults aged 65 and over in Oklahoma represents 13.3% (475,637) of the population. In the Central Oklahoma Economic Development District (COEDD) region, the older population is illustrated in Table 2.

Table 2

2004 Estimate of Population of 60 Years and Older in the COEDD Region

County	Population aged 60+	Total population	% over 60
Hughes	3,106	14,016	22.16%
Lincoln	6,285	32,386	19.41%
Okfuskee	2,547	11,637	21.89%
Pawnee	3,453	16,834	20.51%
Payne	9,866	69,675	14.16%
Pottawatomie	12,381	67,111	18.45%
Seminole	5,243	24,679	21.24%
Total	42,881	236,338	18.14%

Note: Information from U.S. Census Bureau

Research Design

A survey instrument was designed to collect data to answer research questions assessing the level of willingness to evacuate among older adults. This quantitative research study used responses from a 55 item disaster evacuation survey to examine the level of willingness to comply with evacuation orders from emergency government officials and the mass media. The survey instrument was designed to collect data to answer research questions assessing the level of willingness to evacuate among older adults. The survey takes into account demographic data, level of preparedness, prior evacuation, prior disaster experience, and the level of willingness to evacuate in a disaster, when asked to do so by emergency government officials and mass media.

Survey Instrument Tool

The survey instrument created to collect data for this study was the Disaster Evacuation Survey (Appendix B). Survey data requested by participants included: (a) gender, (b) age, (c) marital status, (d) ethnic origin, (e) education level, (f) geographical location, (g) prior disaster experience, (h) prior evacuation, (i) voluntary and mandatory compliance with emergency officials and mass media, (j) having been told by officials to evacuate, (k) following advice of officials, (l) evacuation destination in the event of tornado, flood, fire, and chemical spill, (m) already having basic household items to last for three days in the event of a disaster, (n) having assembled basic household item in one location.

Expert Panel and Pilot Study

An expert panel was formed consisting of ten experts from the field of gerontology and emergency management. These experts were asked to 1) provide any comments or suggestions considered a relevant improvement to the survey; 2) answer additional questions (a scale of 1-5 with, 5 considered excellent): (a) Overall Appeal of Survey, (b) Reading Level, (c) Length of Survey, (d) and also Clarity Understanding of Survey Questions; and 3) also complete the survey instrument tool, noting the start and finish time.

Many of the expert panel members made a suggestion to change or enhance Question #8 and Question #9 font size on the disaster evacuation survey. These questions appeared to be a duplicate question and could confuse many of the older adult participants. The suggestion from the expert panel was considered and a revision

of the survey was made. The expert panel answered the additional questions and completed the survey by an average time of 5 ½ minutes.

In addition to the expert panel, a group pilot study was administered identical to the participation of seniors conducted in the main study. The pilot study consisted of 20 participants from an Oklahoma senior/community center site, similar to the geographical area of the main study. All pilot study participants were 60 years of age and older. The pilot study was formed to provide feedback on survey content and design, and to make certain the survey is readable. All senior pilot study members agreed to the readability and were eager to know the final main study results. The average time to complete the survey instrument and additional questions for all pilot study members was 6 ½ minutes.

Training of Site Managers for Data Collection

After the suggestions from the expert panel and the pilot study were received, the training of site managers could commence. Prior to the data collection of the disaster evacuation surveys, 30 site managers from 30 senior/community centers were trained (Appendix D). These trained site managers were available and present during the group administered survey at each senior/community centers. These 30 site managers (all employees of the State of Oklahoma) were trained in a group setting for the purpose of the following:

- Importance of the study; to have a clear understanding and knowledge about the content of the survey instrument;
- Ensure the confidentiality of all participants' information;
- Assist in facilitating with voluntary participation of the seniors at the senior/community centers.

The site managers were also given a review of training for the data collection procedures, one hour prior to the dissemination of the disaster evacuation survey at each senior/community center.

Dissemination of Voluntary Study Participation

To generate voluntary participation and to announce the upcoming study, information was disseminated by the following:

- One month prior to the voluntary survey participation, all senior/community centers were mailed a disaster evacuation survey flyer (Appendix C) to be posted on the senior/community center event board announcing the upcoming study;
- a press release was also sent to all local newspapers publicizing the survey;
- The Area Agency on Aging (AAA) placed an article pertaining to the up-coming survey in the AAA region newsletter, to disseminate and announce the survey event;
- Two weeks prior to the administered survey, participating senior/community centers were called as a reminder for the upcoming survey.

Participants

The total sample population consisted of 765 individuals aged 60 years and older. The study collected responses from voluntary participants at thirty senior/community centers within seven counties in The State of Oklahoma. Participants completed the administered disaster evacuation survey (Appendix A) at the senior/community center before the noon meal was served.

Protection of Human Subjects

Prior to older adults' participation in this study, each potential respondent was given both a verbal and written description regarding the nature of the study using the Research Consent Form (Appendix A). After agreeing to voluntary participation in this study, participants were informed of their rights, including the right to withdraw from the study at any time without consequences. No identifying information was entered on the study instrument in order to protect the identity and maintain the confidentiality of participants. Contact Information for the Principal Investigator and the Chair of the dissertation committee were provided if respondents needed any additional information regarding the study.

An application for the approval of investigation involving Human Subjects was submitted to The University of North Texas Institutional Review Board (IRB), and approval was granted (Appendix E). Data collection did not occur until approval was granted from the IRB.

Data Collection

The group administered disaster evacuation survey was disseminated to 30 senior/community centers on July 28th through August 15 (a three week period). The group administered survey instrument was dispersed 15-20 minutes prior to the noon meal at all 30 senior/community centers. The primary investigator and trained site managers were present to assist participants with any questions/concerns they might encounter.

At each survey site, surveys were group administered and collected to ensure maximum voluntary participation among older adults at each senior/community center.

Each participant was given a packet containing several participation forms. In the packet given to participants were: (1) an Informed Consent form with the information of the study being conducted and also contact information for the principal investigator and chair of the committee, (2) a disaster evacuation cover sheet, (3) and a disaster evacuation Survey instrument tool to be completed.

A nonmonetary incentive was offered to each participant who completed the survey. In exchange for participants completed surveys, the participants received a raffle ticket for the nonmonetary incentive. Each survey site had two pre-assembled basic disaster kits as the nonmonetary incentive. These basic disaster kits included the following: 12-hour light sticks, MRE 1200 calorie bars, a whistle, pouches of water, an emergency blanket, an emergency rain poncho, and a small pill box.

All thirty senior/community centers were coded using numbers that corresponded to each site to prevent duplication of participants and to keep the answered survey questions anonymous and confidential. The completed group administered surveys were placed in a brown manila envelope and sealed. The surveys were then transported from all 30 senior/community centers in a locked nontransparent, fire-proof, file box to maintain confidentiality. A message of appreciation and gratitude for the survey participation of all older adults was given in the local newspapers and the Area Agency on Aging regional newsletter.

Summary

In summary, the current study consisted of 765 individuals aged 60 years and older, who reside in seven counties within the State of Oklahoma (Hughes, Lincoln,

Okfuskee, Payne, Pottawatomie, Pawnee & Seminole counties). These older adults voluntarily participated in the disaster evacuation survey, which was conducted at 30 senior/community centers. The focus of this study was the relationship between older adults and the level of willingness to evacuate either voluntary or mandatory in the event of a disaster with regard to the following emergency management officials and mass media: (a) law enforcement officers, (b) TV news alert, (c) military/national guard, (d) radio news alert, (e) neighbors, (f) fire department, (g) mayor/governor, (h) American Red Cross, (i) church officials, and (j) local emergency management.

CHAPTER 4

RESULTS

Introduction

This chapter presents a detailed explanation of the survey instrument tool coding and a thorough analysis of reliability and validity of data. An outline of data analyses are provided in this chapter. The distribution of data collected used frequencies analyses on personal characteristics (preconditions) and distribution of responses for voluntary and mandatory responses of older adults. This chapter also provides further data analyses using one-way ANOVA comparisons, linear regression analysis, and logistic regression analysis.

Coding of Survey Instrument Tool

The Disaster Evacuation Survey, used to collect information about participants was coded for entry into SPSS™ for data analysis. The Disaster Evacuation Survey was used to measure the willingness to evacuate either voluntary or mandatory among older adults in the event of a disaster. Coding scores for the survey, ranged from 0, 1, 2, 3, 4, and 5 for all questions presented on the disaster evacuation survey. The questions pertaining to voluntary and mandatory evacuation were based on a 5-point likert scale ranging from *strongly agrees* to *strongly disagree* to the following statements: I would comply with a Voluntary Evacuation Request from (a) law enforcement officers, (b) TV news alert, (c) military/national guard, (d) radio news alert, (e) neighbors, (f) fire department, (g) mayor/governor, (h) American Red Cross, (i) church officials, and (j) local emergency management; and I would comply with a Mandatory Evacuation Order

from (a) law enforcement officers, (b) TV news alert, (c) military/national guard, (d) radio news alert, (e) neighbors, (f) fire department, (g) mayor/governor, (h) American Red Cross, (i) church officials, and (j) local emergency management. The instrument is scaled by the higher the score, the greater the compliance regarding the willingness to evacuate among older adults with regard to emergency government officials and mass media.

Reliability of Survey Instrumental Tool

The survey instrument was thoroughly field tested to ensure reliability and validity of data. To determine the degree of reliability in the survey instrument, Cronbach's alpha reliability analysis was conducted using SPSS™ statistical and data management package software (SPSS Inc., <http://www.SPSS.com>). Variables relating to the research questions were combined and analyzed to determine how consistently the selected variables addressed the corresponding questions. According to George and Mallery (2003), a reliability coefficient of 0.7 or greater is considered acceptable. An analysis of the survey items in this study produced a reliability coefficient of 0.945 for the voluntary variables and a 0.956 for the mandatory variables.

Dependent & Independent Variables with Preconditions

The following are the independent, dependent variables, and preconditions in the study:

Dependent: willingness to voluntary and mandatory evacuate

Independent: law enforcement officers, TV news alert, military/national guard, radio news alert, neighbors, fire department,

mayor/governor, American Red Cross, church officials,
and local emergency management

Preconditions: gender, age, marital status, ethnic origin, and education level.

In table 3, the personal characteristics (preconditions) are shown in the first column: (a) gender, (b) age, (c) marital status, (d) ethnic origin, and (e) education level. The independent variables are shown in the second column which are the emergency government officials and the mass media: (a) law enforcement officers, (b) TV news alert, (c) military/national guard, (d) radio news alert, (e) neighbors, (f) fire department, (g) mayor/governor, (h) American Red Cross, (i) church officials, and (j) local emergency management. The last column displays the dependent variable of willingness to evacuate either voluntary or mandatory.

Table 3

The Demographic Data (Preconditions), Independent Variables, and the Dependent Variables in the Study

Demographic Data (Preconditions)	Independent Variables	Dependent Variable
Gender Age Marital Status Ethnic Origin Educational Level	law enforcement officers TV news alert military/national guard radio news alert neighbors fire department Mayor/Governor American Red Cross church officials local emergency management	Level of Willingness To evacuate either Voluntary or mandatory in the event of a disaster

Methods of Data Analysis

The data were obtained from the disaster evacuation survey and was returned by older adults from seven counties in Oklahoma. The data were analyzed using the SPSS™ for Windows Version 17.0. The various statistical methods such as frequency distributions, reliability estimates, ANOVA comparisons, linear regression analysis, and also logistic regression analysis were used to answer the research questions.

Distribution of Demographic Data

In the sample population, distributions of demographic data in the seven counties were analyzed. Table 4 displays the (a) geographical location, and (b) county residence among the sample population. The sample population consisted of 640 rural (83.7%) participants and 125 urban (16.3%) participants. Among the distribution of participants by county, 141 (18.4%) participants reside in Hughes County, 147 (19.2%) reside in Lincoln County, 81 (10.6%) reside in Okfuskee County, 28 (3.7%) reside in Pawnee County, 106 (13.9%) reside Payne County, 168 (22.0%) reside in Pottawatomie County, and 94 (12.3%) resided in Seminole County.

Table 4

Distribution of Geographical Location and County Residence in the Sample Population

County Residence	N	Sample data %
Rural Counties		
Hughes County	141	18.4%
Lincoln County	147	19.2%
Okfuskee County	81	10.6%
Pawnee County	28	3.7%
Seminole County	94	12.3%
Urban Counties		
Payne County	106	13.9%
Pottawatomie County	168	22.0%
Total	765	100.0%

Note: Rural n = 640; Sample data % = 83.7% Note: Urban (n = 125); Sample data % = 16.3%
Totals: N =765; Sample data % = 100.0%

Table 5 displays the demographic variables (preconditions) which were (a) gender, (b) age, (c) marital status, (d) ethnic origin, (e) education level. These variables were used to describe the personal characteristics of the sample population from seven counties in The State of Oklahoma. The gender in the sample population was 488 (63.8%) female participants and 277 (36.2%) male participants for a total of 765. The age range of the sample population was 60-69, 70-79, and 80+ years of age and older. The sample consisted 220 (28.8%) in the age range of 60-69, 297 (38.8%) in the age range of 70-79, and 244 (31.9%) in the 80 years of age range and over. Four participants failed to respond to the age question, table 4 reflects these responses as missing. *Not going to reveal my age* was the response for all four of the missing responses from these participants.

The marital status question showed 345 (45.1%) participants were married, 313 (40.9%) were widowed, 7(0.9%) were separated, 77(10.1%) were divorced, and 23 (3.0%) were never married. All 765 participants completed the marital status survey question.

The ethnic origin question reflected 667 (87.2%) participants considered themselves of white descent, 30 (3.9%) were African American, 4 (0.5%) were Hispanic, 3 (0.4%) were Asian, 49 (6.45) were American Indian/Alaskan Native, and 12 (1.6%) were considered other. All 765 participants completed the ethnic survey question.

The survey question regarding the highest level of education received showed 45 (5.9%) of participants received a grade school education or less, 151 (19.7%) received Junior High and some High School, 297 (38.8%) received a High School Degree, 84 (11.0%) received some college education, 103 (13.5%) received 1 or more years of college education, but no degree was earned, and 85 (11.1%) received a college degree. All 765 participants completed the education survey question.

Table 5

Distribution of Demographic Variables (Preconditions) in the Sample Population

Gender	<i>N</i>	Sample data %
Female	488	63.8%
Male	277	36.2%
Total	765	100.0%
Age	<i>N</i>	Sample data %
Missing	4	0.5%
60-69	220	28.8%
70-79	297	38.8%
80+	244	31.9%
Total	765	100.0%
Marital Status	<i>N</i>	Sample data %
Married	345	45.1%
Widowed	313	40.9%
Separated	7	0.9%
Divorced	77	10.1%
Never married	23	3.0%
Total	765	100.0%
Ethnic Origin	<i>N</i>	Sample data %
White	667	87.2%
African American	30	3.9%
Hispanic	4	0.5%
Asian	3	0.4%
Indian/Alaskan native	49	6.4%
Other	12	1.6%
Total	765	100.0%
Education	<i>N</i>	Sample data %
Grade school or less	45	5.9%
Junior High and some High School	151	19.7%
High school	297	38.8%
Some College	84	11.0%
1+ College/No degree	103	13.5%
College degree	85	11.1%
Total	765	100%

Analysis of Research Questions

The results of this study identified the willingness of evacuation among older adults regarding emergency government officials and mass media in the event of a disaster. The following research questions are addressed:

Research Question 1: What is the willingness among older adults to evacuate from their homes when asked to do so by mass media and/or emergency management officials?

Research Question 1 addresses how older adults will comply if emergency management officials and the media request asked to do so (voluntary evacuation request) or told to do so (mandatory evacuation order) in the event of a disaster. The following emergency government officials and mass media are examined: (a) law enforcement officers, (b) TV news alert, (c) military/national guard, (d) radio news alert, (e) neighbors, (f) fire department, (g) mayor/governor, (h) American Red Cross, (i) church officials, and (j) local emergency management. Descriptive statistics were measured using a frequency analysis.

Voluntary Evacuation Request

Table 6 reflects the distribution of voluntary evacuation request among the sample population on a 5-point likert scale, ranging from strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5). The respondents, whom replied with a higher score, are more likely to comply with a voluntary evacuation request. The top three emergency government officials whom older adults would *strongly agree* to comply from: (1) fire department 386 (50.5%), (2) military/national guard 380 (49.7%),

and (3) law enforcement officials 378 (49.4%). Older adults who *agree* have a tendency to comply with: (1) TV news alerts 264 (34.5%), (2) radio news alert 260 (34.0%), and (3) church officials 256 (33.5%). In the middle column, older adults who were *neutral* on complying with their neighbors 187 (24.4%) regarding a voluntary evacuate request, were closely followed by radio news alerts 167 (21.8%) and also church officials 172 (22.5%). In the *disagree* column, those older adults who would have a tendency to not comply with neighbors 45 (5.9%), radio news alerts 43 (5.6%), and also church officials 40 (5.2%). In the *strongly disagree* category, neighbors 77 (10.1%) scored the highest percentage followed by mayor/governor 56 (7.3%) and American Red Cross 54 (7.1%).

Table 6

Distribution of Voluntary Evacuation Request in Sample Population

I would comply with a voluntary evacuation request from:	Strongly Disagree	Sample %	Disagree	Sample %	Neutral	Sample %	Agree	Sample %	Strongly Agree	Sample %	Total	Total %
Law enforcement official	46	6.0%	19	2.5%	75	9.8%	247	32.3%	378	49.4%	765	100%
TV news alerts	44	5.8%	31	4.1%	152	19.9%	264	34.5%	274	35.8%	765	100%
Military/national guard	46	6.0%	13	1.7%	94	12.3%	232	30.3%	380	49.7%	765	100%
Radio news alerts	47	6.1%	43	5.6%	167	21.8%	260	34.0%	248	32.4%	765	100%
Neighbors	77	10.1%	45	5.9%	187	24.4%	248	32.4%	208	27.2%	765	100%
Fire Department	45	5.9%	12	1.6%	72	9.4%	250	32.7%	386	50.5%	765	100%
Mayor/Governor	56	7.3%	26	3.4%	133	17.4%	240	31.4%	310	40.5%	765	100%
American Red Cross	54	7.1%	26	3.4%	139	18.2%	235	30.7%	311	40.7%	765	100%
Church officials	52	6.8%	40	5.2%	172	22.5%	256	33.5%	245	32.0%	765	100%
Local emergency management	39	5.1%	17	2.2%	108	14.1%	245	32.0%	356	46.5%	765	100%

Mandatory Evacuation Order

Table 7 reveals the distribution of a mandatory evacuation order among the sample population on a 5-point likert scale, ranging from strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5). The older adults, who replied with a higher score, are more likely to comply with a mandatory evacuation order. The top three emergency government officials; older adults would most likely to comply (*strongly agree*) with are: (1) law enforcement official 442 (57.8%), (2) fire department 424 (55.4%), and (3) military/national guard 418 (54.6%). Older adults who have a tendency to comply (*agree*) are: (1) radio news alert 255 (33.3%), (2) TV news alerts 248 (32.4%), and (3) church officials 227 (29.7%). Those older adults who have a tendency to *disagree* with a mandatory compliance regarding their neighbors 37 (4.8%), church officials 32 (4.2%), and also radio news alerts 24 (3.1%). Older adults who were less likely to comply (*strongly disagree*) with a mandatory evacuation order from their neighbors 64 (8.4%), church officials 53 (6.9%) and American Red Cross 48 (6.3%).

Table 7

Distribution of Mandatory Evacuation Order in Sample Population

I would comply with a mandatory evacuation order from:	Strongly Disagree	Sample %	Disagree	Sample %	Neutral	Sample %	Agree	Sample %	Strongly Agree	Sample %	Total	Total %
Law enforcement official	42	5.5%	8	1.0%	70	9.2%	203	26.5%	442	57.8%	765	100%
TV news alerts	38	5.0%	22	2.9%	134	17.5%	248	32.4%	323	42.2%	765	100%
Military/national guard	41	5.4%	9	1.2%	87	11.4%	210	27.5%	418	54.6%	765	100%
Radio news alerts	45	5.9%	24	3.1%	147	19.2%	255	33.3%	294	38.4%	765	100%
Neighbors	64	8.4%	37	4.8%	177	23.1%	222	29.0%	265	34.6%	765	100%
Fire Department	40	5.2%	7	0.9%	80	10.5%	214	28.0%	424	55.4%	765	100%
Mayor/Governor	43	5.6%	22	2.9%	113	14.8%	224	29.3%	363	47.5%	765	100%
American Red Cross	48	6.3%	17	2.2%	128	16.7%	214	28.0%	358	46.8%	765	100%
Church officials	53	6.9%	32	4.2%	158	20.7%	227	29.7%	295	38.6%	765	100%
Local emergency management	34	4.4%	12	1.6%	100	13.1%	218	28.5%	401	52.4%	765	100%

Research Question 2: Does an evacuation's being mandatory versus voluntary influence the willingness to evacuate among older adults? (I will comply with a mandatory evacuation order? I will comply with a voluntary evacuation request)?

Difference among Voluntary and Mandatory Evacuation Scales

Table 8 reveals the overall compliance of both mandatory and voluntary evacuation scales. These scales were examined to determine the difference in the level of willingness to evacuate by both a voluntary and a mandatory evacuation scale. The voluntary evacuation request scale is characterized by a mean of 3.97 and the mandatory scale is characterized by a mean of 4.09, both scales averaged on a high compliance of *agree*.

A paired-samples *t*-test revealed a significant difference in the mandatory scale minus the voluntary scale, $t(764) = 5.27$, $p = 0.00$. The *t*-test indicates that older adults are more likely to comply with a mandatory evacuation order than a voluntary request from emergency officials.

Table 8

Distribution of Differences in Voluntary and Mandatory Scales

		Voluntary Scale	Mandatory Scale	Difference Scale
N	Valid	765	765	765
	Missing	0	0	0
Mean		3.9654	4.0869	0.1216
Std. Error of Mean		0.03340	0.03405	0.02308
Std. Deviation		0.92368	0.94188	0.63832
<i>t</i> - value				5.268
df				764
Sig.				0.000

The present study reveals a skewness (0.355) being positively skewed, shown below in figure 4. According to Leech, Barrett, and Morgan (2005), skewness refers to the lack of symmetry in a frequency distribution. Distributions with a long *tail* to the right have a positive skew and those with a long *tail* on the left have a negative skew. If the mean (0.122) is < the median (0.000) the skew is negative.

Kurtosis refers to the extent to which data are concentrated in the peak versus the tail. A positive value indicates that data are concentrated in the peak, and a negative value indicates that data are concentrated in the tail (Leech et al, 2005). In the present study, figure 3 illustrates a positive kurtosis, by the large peak.

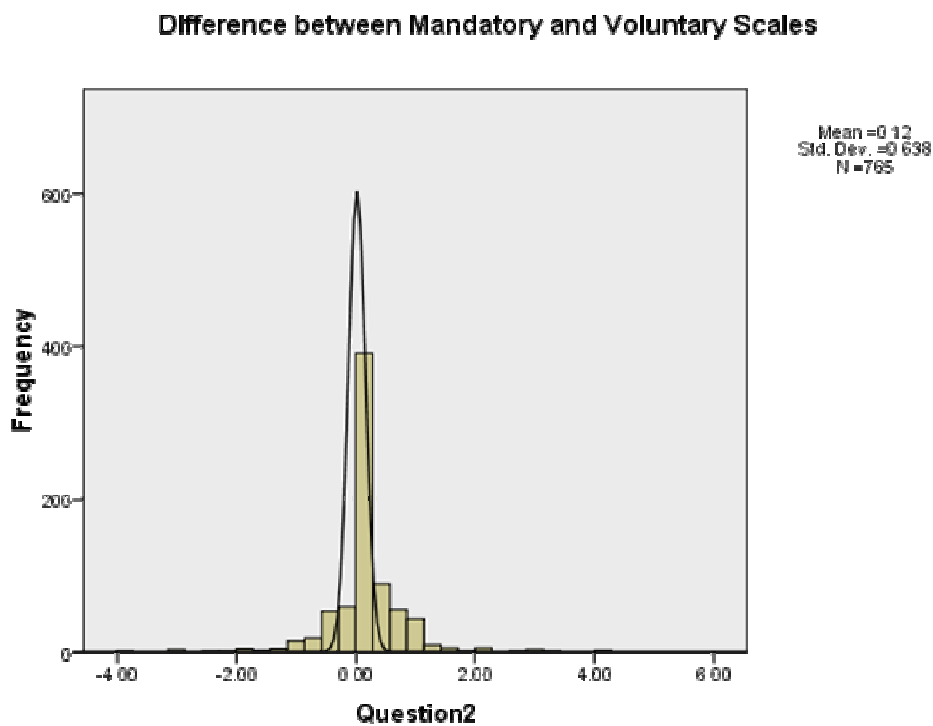


Figure 3. Difference between mandatory and voluntary scales in the frequency distribution.

Figure 4, displays the differences in the respondents, who would comply with a mandatory order or a voluntary request. The portion in Figure 5, labeled 3.00 (40%), represents those respondents who have a greater compliance with a mandatory evacuation order. The portion labeled 2.00 (40%), reveals those respondents who would comply with either a voluntary request or a mandatory order regarding emergency management officials in the event of a disaster evacuation. The smaller portion, labeled 1.00 (20%), represents those respondents who have a greater compliance with a voluntary request by emergency government officials.

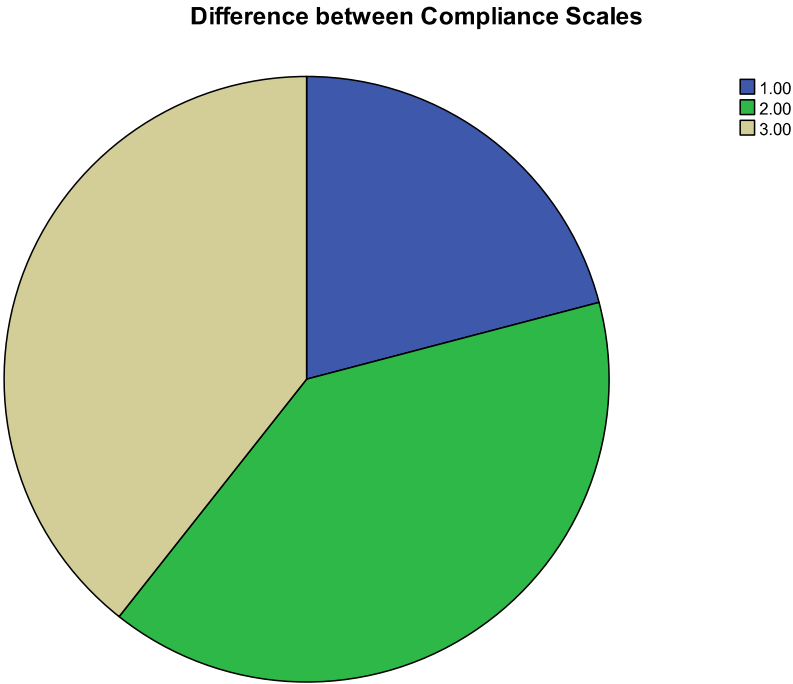


Figure 4. Difference between compliance scales in the frequency distribution.

Research Question 3: Do preconditions (Gender, Marital Status, Age, Ethnic Origin, Education Levels, Level of Preparedness, Prior evacuation, Geographical Location, and County Residence) influence the willingness to evacuate among older adults?

Bivariate ANOVA Comparisons using Preconditions

An analysis of variance was performed using one-way ANOVA analyses. The one-way ANOVA's were performed to examine the variability between and within the categorical variables (preconditions) on the continuous scale for each of the compliance scales (voluntary and mandatory). The preconditions (gender, age, marital status, ethnic origin, education level, level of preparedness, prior disaster experience, prior evacuation, geographical location, and county residence) were compared using ANOVA ($p < 0.05$).

ANOVA comparisons showed only a significant difference for *gender*, the voluntary scale revealed ($p = 0.012$), and the mandatory scale reflects ($p = 0.004$) as shown in Table 9. Although not significant, there were trend differences for the age category where MISSING variable had the highest means for both voluntary (4.55) and mandatory (4.78) scales. For the precondition variable, marital status, ANOVA showed no significant differences. Although not significant, there was a trend difference for the *marital status precondition for the voluntary scale* where respondents who were *separated* had the highest mean (4.14) and respondents who were *divorced* had the lowest mean (3.85). In addition, the mandatory scale suggests those respondents who were widowed had the highest means (4.15) and the respondents who stated they were *never married*, had the lowest mean score of (3.94). For *ethnic origin*, ANOVA showed

no significant differences. Although not significant, there was a trend difference for the *voluntary scale* those respondents who are *Indian/Alaskan Native* and *other* had the same highest means (4.06), those respondents who were *African American* has the lowest mean (3.85). As for the mandatory scale, *Indian/Alaskan Native* respondents had the highest means (4.33), while the lowest means (3.96) were those respondents in the *other* category. ANOVA showed no significant differences for the education level achieved. Those respondents who have obtained a college degree had the lowest compliance means (3.84) for the voluntary scale. As for the mandatory scale, the highest compliance means (4.19) revealed the education category *grade school or less*, while those respondents with a college degree had a lowest means score (3.98). ANOVA revealed no significant differences with regard to geographical location (rural, urban). Although not significant, there was a trend difference for the respondents who were considered in a *rural* geographical location. The voluntary scale revealed the highest mean score was the rural respondents (3.97). As for the mandatory scale, the highest mean score was (4.10) for the *rural* respondents. ANOVA showed no significant difference for the category of *county residence*. Although not significant, there was a trend difference with regard to the voluntary scale of Hughes County with the lowest mean score (3.88) and Pawnee County had the highest means (4.33). As for the mandatory scale, Pawnee County still revealed the highest means (4.34) and Lincoln County with the lowest means (4.02).

Table 9

ANOVA Comparisons of Preconditions According to the Compliance Scales (Voluntary /Mandatory)

Scales	Preconditions	N = 765	Mean	F	Sig. (p)
	Gender				
	Male	277	3.84		
Voluntary	Female	488	4.03	6.38	0.012
	Male	277	3.95		
Mandatory	Female	488	4.16	8.43	0.004
	Age				
	Missing	4	4.55		
	60-69	220	3.98		
Voluntary	70-79	297	3.96	0.560	0.641
	80+	244	3.96		
	Missing	4	4.55		
	60-69	220	4.07		
Mandatory	70-79	297	4.09	0.729	0.535
	80+	244	4.09		
	Marital Status				
	Married	345	3.97		
	Widowed	313	3.98		
Voluntary	Separated	7	4.14	0.410	0.801
	Divorced	77	3.85		
	Never Married	23	3.98		
	Married	345	4.06		
	Widowed	313	4.15		
Mandatory	Separated	7	4.00	0.745	0.561
	Divorced	77	4.00		
	Never Married	23	3.94		
	Ethnic Origin				
	White	667	3.96		
	African	30	3.85		
Voluntary	American Indian / Alaskan Native	49	4.06	0.376	0.770
	Other	19	4.06		
	White	667	4.07		

(table continues)

Table 9 (continued).

Scales	Preconditions	N = 765	Mean	F	Sig. (p)
Mandatory	African	30	4.05	1.241	0.294
	American Indian/Alaskan Native	49	4.33		
	Other	19	3.96		
	Education Level				
	Grade School or less	45	4.01		
	Junior High / Some HS	151	3.93		
Voluntary	HS Degree	297	4.01	0.553	0.736
	Some College	84	3.93		
	1+ College / No Degree	103	3.98		
	College Degree	85	3.84		
	Grad school or less	45	4.19		
	Junior High / Some HS	151	4.00		
Mandatory	HS Degree	297	4.14	0.845	0.518
	Some College	84	4.06		
	1+ College/ No Degree	103	4.14		
	College Degree	85	3.98		
	Geographical Location	765			
Voluntary	Rural	640	3.97	0.018	0.893
	Urban	125	3.96		
Mandatory	Rural	640	4.10	0.601	0.439
	Urban	125	4.03		
	Co. Residence	765			
	Hughes	141	3.88		
	Lincoln	147	3.94		
	Okfuskee	81	3.91		

(table continues)

Table 9 (continued).

Scales	Preconditions	N = 765	Mean	F	Sig. (p)
Voluntary	Pawnee	28	4.33	1.168	0.321
	Payne	106	4.06		
	Pottawatomie	168	3.96		
	Seminole	94	3.98		
	Hughes	141	4.03		
	Lincoln	147	4.02		
Mandatory	Okfuskee	81	4.05	0.679	0.667
	Pawnee	28	4.34		
	Payne	106	4.10		
	Pottawatomie	168	4.13		
	Seminole	94	4.14		

Linear Regression Analysis

A second analysis was conducted using regression analyses. Regression analyses were used to predict the compliance variables the relationships between the preconditions (attribute variables) and the Voluntary and Mandatory scales (continuous variables). Three regression models are shown.

Table 10 displays results of the linear regression analysis using the voluntary scale (Model 1) with regard to the predictor variables (preconditions). The voluntary scale was used resulting in R-squared of 0.015 of an adjusted R Square -0.03. The adjusted R squared is – 0.03, means there is no relationship between the voluntary scale that can be predicted from the preconditions combine. The analysis also reveals older adult males (0.011) have a greater tendency to comply with a mandatory evacuation order than a voluntary request.

Table 10

Linear Regression Analysis of Predicting the Voluntary Scale and Preconditions (Model 1)

Precondition	Coefficient	t-value	Sig.
Intercept	4.161	25.204	0.000
Gender-Male	-0.190	-2.555	0.011*
Age 70+	-0.032	-0.372	0.710
Age 80+	-0.003	-0.037	0.970
Education Junior High/ HS +	-0.112	-0.705	0.481
Education HS+	0.069	0.743	0.458
Education less than 1yr college	-0.062	-0.536	0.592
Education 1+yrs of college	0.041	0.300	0.764
Education College Degree	-1.11	-0.800	0.424
Marital Status – Widowed	-0.045	-0.559	0.577
Marital Status – Sep/Divorced	-0.132	-1.146	0.252
Marital Status – Never Married	0.003	0.014	0.989
Ethnic Origin–African American	-0.120	-6.79	0.497
Ethnic Origin- Other, Hispanic, & Asian	0.140	0.648	0.517
Ethnic Origin- American Indian/ Alaskan Native	0.087	0.630	0.529

*Significant at the 0.05 level

** Significant at the 0.001 level

N	R	R Square	Adjusted R Square	Std. Error of the Estimate
761	0.124	0.015	-0.003	0.926

Table 11 reveals results of the linear regression analysis using the mandatory scale (Model 2) with regard to the predictor variables (preconditions). The mandatory scale was used resulting in R-squared of 0.023 of an adjusted R Square 0.004. The adjusted R squared is 0.004, meaning that only 0.4% of the variance of compliance in

the mandatory scale can be predicted from the preconditions combine.

Table 11

Linear Regression Analysis of Predicting the Mandatory Scale and Preconditions (Model 2)

Precondition	Coefficient	t-value	Sig.
Intercept	4.282	25.534	0.000
Gender-Male	-0.189	-2.504	0.012*
Age 70+	-0.015	-0.171	0.864
Age 80+	-0.016	-1.85	0.853
Education Junior High/ HS +	-0.210	-1.303	0.193
Education HS+	0.115	1.216	0.224
Education less than 1yr college	-0.053	-0.455	0.649
Education 1+yrs of college	0.083	0.594	0.553
Education College Degree	-0.140	-0.995	0.320
Marital Status - Widowed	0.036	0.446	0.656
Marital Status – Sep/Divorced	-1.03	-0.881	0.379
Marital Status – Never Married	-0.126	-0.617	0.538
Ethnic Origin–African American	-0.064	-0.356	0.722
Ethnic Origin- Other, Hispanic, & Asian	-0.058	-0.0262	0.794
Ethnic Origin- American Indian/ Alaskan Native	0.245	1.742	0.082

*Significant at the 0.05 level

** Significant at the 0.001 level

N	R	R Square	Adjusted R Square	Std. Error of the Estimate
765	0.150	0.023	0.004	0.941

Dependent Variable-Mandatory Scale

Table 12 displays the results of the difference scale (mandatory scale minus the voluntary scale) using a linear regression analysis (Model 3) with regard to the predictor

variables (preconditions). This table reveals a statistical significance at the 0.05 level. The respondents who are considered to be of ethnic origin *American Indian/Alaskan Native* (0.009) with a positive coefficient are more likely to response to a mandatory evacuation order than a voluntary request from emergency government officials.

Table 12

Linear Regression Analysis of Predicting the Difference Scale and Preconditions (Model 3)

Precondition	Coefficient	t-value	Sig.
Intercept	2.239	16.662	0.000
Gender-Male	-0.015	-0.256	0.798
Age 70+	-0.009	-0.256	0.798
Age 80+	-0.052	0.775	0.439
Education Junior High/ HS +	-0.098	-0.758	0.449
Education HS+	0.059	0.776	0.438
Education less than 1 yr. college	-0.024	-0.257	0.797
Education 1+ yrs. College	0.113	1.004	0.316
Education College Degree	-0.111	-0.986	0.325
Marital Status – Widowed	0.035	0.537	0.591
Marital Status – Sep/Divorcee	-0.075	-0.798	0.425
Marital Status Never Married	-0.247	-1.506	0.133
Ethnic Origin – African American	0.117	0.809	0.419
Ethnic Origin – Other, Hispanic & Asian	-0.206	-1.170	0.243
Ethnic Origin – America Indian/ Alaskan Native	0.297	2.631	0.009*

*Significant at the 0.05 level

** Significant at the 0.001 level

<i>N</i>	<i>R</i>	<i>R Square</i>	<i>Adjusted R Square</i>	<i>Std. Error of the Estimate</i>
761	0.145	0.021	0.003	0.75370

Dependent Variable-Difference Scale

Binary Logistic Regression Analysis

Table 13 shows the results of the binary logistic regression analysis using the voluntary scale that is greater than the mandatory scale using the preconditions. Older adults, who have obtained a *college degree* (0.046), are more likely to have a tendency to comply with a mandatory order rather than a voluntary request from emergency management officials. Another precondition that had statistical significance were older adults who were of ethnic origin *African American* (0.050) with a positive coefficient are more likely to response to a voluntary request made by emergency government officials rather than a mandatory order.

Table 13

Binary Logistic Regression Analysis –Using Voluntary/Mandatory Scales and Preconditions

Precondition (<i>df</i> = 14)	Coefficient t	Standard Error	Sig.
Intercept	1.299	0.360	0.003
Gender-Male	0.122	0.166	0.537
Age 70+	0.023	0.191	0.919
Age 80+	0.053	0.186	0.810
Education Junior High/ HS +	-0.033	0.355	0.938
Education HS+	0.004	0.213	0.986
Education less than 1 yrs college	-0.150	0.257	0.622
Education 1+ yrs of college	0.450	0.345	0.235
Education College Degree	-0.734	0.030	0.046*
Marital Status – Widowed	-0.076	0.179	0.724
Marital Status – Sep/ Divorced	-0.199	0.261	0.417
Marital Status – Never Married	-0.827	0.473	0.080
Ethnic Origin – African American	1.457	0.405	0.050*
Ethnic Origin – Other, Hispanic & Asian	-0.459	0.305	0.369
Ethnic Origin – American Indian /Alaskan Native	0.881	0.533	0.069

**p-value* < 0.05

Table 14 reveals the results of a binary logistic regression analysis, the mandatory scale that is greater than a voluntary scale. One of the preconditions was statistically significant. The older adults who were of ethnic origin *American Indian/Alaskan Native* (0.013) are more likely to comply with a voluntary evacuation request than a mandatory order.

Table 14

Binary Logistic Regression Analysis – Using Mandatory/Voluntary Scales and Preconditions

Precondition (df=14)	Coefficient	Standard Error	Sig.
Intercept	0.239	0.360	0.507
Gender-Male	0.023	0.166	0.888
Age 70+	0.058	0.191	0.763
Age 80+	0.262	0.186	0.158
Education Junior High/ HS +	0.402	0.355	0.257
Education HS+	-0.255	0.213	0.232
Education less than 1yr college	-0.007	0.257	0.979
Education 1+yrs of college	-0.179	0.305	0.557
Education College Degree	-0.052	0.304	0.863
Marital Status – Widowed	-0.206	0.179	0.248
Marital Status – Sep/Divorced	0.187	0.261	0.473
Marital Status – Never Married	0.402	0.437	0.395
Ethnic Origin–African American	0.227	0.405	0.575
Ethnic Origin- Other, Hispanic, & Asian	0.553	0.533	0.300
Ethnic Origin- American Indian/ Alaskan Native	-0.756	0.305	0.013*

*p-value < 0.05

Summary

In summary, the current study used several statistical methods to analyze the demographic data and the research questions. In addition to the statistical methods used, a Cronbach's alpha reliability analysis was conducted. This study produced a reliability coefficient of 0.945 for the voluntary scale and a 0.956 for the mandatory scale. The voluntary and mandatory scales use the following independent variables, dependent variables, and preconditions in the study:

Dependent: willingness to voluntary and mandatory evacuate

Independent: law enforcement officers, TV news alert, military/national guard, radio news alert, neighbors, fire department, mayor/governor, American Red Cross, church officials, and local emergency management

Preconditions: gender, age, marital status, ethnic origin, and education level.

Research Question 1 addressed how older adults will comply if emergency management officials and the media request asked to do so (voluntary evacuation request) or told to do so (mandatory evacuation order) in the event of a disaster. A 5-point likert scale was used to determine the range of responses from strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5). The top emergency government officials whom older adults would *strongly agree* to comply with a voluntary request from is the fire department 386 (50.5%). The top emergency government officials whom older adults would most likely comply with a mandatory order (*strongly agree*) are law enforcement officials 442 (57.8%).

Research Question 2 addresses the question, Does an evacuation's being

mandatory versus voluntary influence the willingness to evacuate among older adults?

The voluntary and mandatory scales were examined to determine the level of willingness to evacuate among older adults. Both scales averaged on a high compliance of agree. A paired-sample *t*-test was conducted which indicates that older adults are more likely to comply with a mandatory evacuation order than a voluntary request from emergency officials.

Research Question 3 addresses the issue; Do preconditions (gender, marital status, age, ethnic origin, level of education, level of preparedness, prior evacuation, Geographical Location, and county residence) influence the willingness to evacuate among older adults? Several analyses were conducted for this study. One-way ANOVA comparisons showed only a significant difference for *gender*. In addition to the one-way ANOVA comparisons, the linear regression analysis reveals that older adult males (0.011) have a greater tendency to comply with a mandatory evacuation order than a voluntary request. The older adults in the study who were of ethnic origin *American Indian/Alaskan Native* (0.013) are more likely to response to a mandatory evacuation order than a voluntary request from emergency government officials. A logistic regression analysis was also conducted and determined that older adults who have obtained a *college degree* (0.046), are more likely to have a tendency to comply with a mandatory order rather than a voluntary request from emergency management officials. Another precondition that had statistical significance were older adults who were of ethnic origin *African American* (0.050) with a positive coefficient are more likely to response to a voluntary request made by emergency government officials rather than a mandatory order.

CHAPTER 5

CONCLUSION

Summary of Findings

This study collected responses of 765 voluntary participants from thirty senior/community centers within seven counties in The State of Oklahoma. The objective of this research study was accomplished by using the disaster evacuation survey to measure older adults' level of willingness to evacuate. Findings from prior studies and how these studies relate to the present study are as follows:

Overall Warning Message Compliance

- Prior studies have yielded mixed results regarding compliance of warning messages. Some prior studies have reported that older adults tend not to comply with warning messages (Moore, Bates, Layman, & Parenton, 1963; Bernert, & Ikle, 1952; Ellemers & Veld-Langeveld, 1955; Steele, Lyons, & Smith, 1979; Windham, Posey, Ross, & Spencer, 1977). Other studies have reported that older adults tend to be no different or more likely to comply with warning messages (Hutton, 1976; Perry, Lindell & Greene, 1981; Quarantelli, 1980; Mileti, Drabek, & Haas, 1975). The findings from this study support the overall compliance that older adults are more likely to comply (*agree*) to warning messages made by emergency officials. This study also revealed that older adults aged 60 and older, are more likely to comply with a mandatory evacuation order than a voluntary request from emergency officials.

Age

- A number of studies have found older adults to have lower evacuation rates than younger adults (Drabek 1986; Gladwin & Peacock 1997; Wilmot & Mei, 2004). However, some studies have found no statistical significance between the age of the warning recipient and their subsequent level of warning compliance (Perry & Lindell, 1997; Zhang et al., 2004). Surprisingly, the precondition *age* has shown no statistical significance in the current research study. This finding supports the works of (Perry & Lindell, 1997; & Zhang et al., 2004) who have reported no statistical significance between age and the level of warning compliance.

Gender

- Not all studies have found statistical significance between older men and women (Zhang et al., 2004). However, a number of studies have found that evacuation rates are higher for women than for men (Bateman & Edwards 2002; Drabek 1986; Riad et al., 1999; Whitehead et al., 2000; Rosenkoetter, 2007). Older adults males have a significantly lower tendency to comply with mandatory evacuation orders. The current study has shown a statistical significance and supports evacuation rates that tend to be higher among women than for men.

Marital Status

- There are limited studies regarding the marital status of older adults in disaster evacuations. Older adults requiring the use of special equipment during a disaster evacuation were more likely to be white unmarried females (McGuire, Ford, & Okoro, 2007). The current study found no statistical significance with marital status and a voluntary or mandatory evacuation order.

Ethnic Origin

- The empirical evidence regarding minorities and evacuation has yielded mixed results. Some studies have found lower evacuation rates among minorities (Gladwin & Peacock 1997), some studies have found lower rates for some minorities but not for others (Riad et al., 1999), and some other studies have found no statistical significance (Bateman & Edwards 2002). The current study supports the work of (Riad et al., 1999), and has shown statistical significance with African Americans who have a tendency to comply more with a voluntary evacuation rather than a mandatory order. Also in the current study, American Indian/Alaskan Native older adults have a tendency to response to a mandatory evacuation order than a voluntary request from emergency government officials and the mass media.

Level of Education

- Some studies have found that education has no statistical significance on evacuation rates (Bateman & Edwards 2002; Gladwin & Peacock 1997; Whitehead et al., 2000). The findings of the current study have shown a statistical significance with older adults who have obtained a college degree and does not support the prior study. Older adults who have a college degree are more likely to respond to a mandatory evacuation order than a voluntary request by emergency government officials.

Research Limitations

There are several research limitations in the present study that are important to consider. The first limitation is the current study was conducted with older adults at only 30 senior centers located in one mid-western state. Examining older adults' nationwide will aid with an improved insight and understanding on disaster evacuation with this population.

Only older adults who have the ability to attend senior centers are in the sample population. This present study did not examine the level of willingness regarding isolated-homebound individuals in the event of a disaster. Identifying effective disaster evacuation interventions will ensure a more improved disaster evacuation for all older adults.

The capability of evacuation is a necessary limitation needing to be examined among older adults. Many respondents stated that they could run up a hill in the anticipation of a disaster. Many of these respondents used wheelchairs, walkers, and walking canes for use of mobility. Limited mobility among older adults could hinder the evacuation process.

Research Implications

The current study poses several research implications that need to be address:

What are the implications of seniors' tending to slightly favor mandatory over voluntary orders in terms of compliance?

- Seniors leaning slightly in favor toward a mandatory evacuation order versus a voluntary request may add pressure to emergency officials to make a strong decision and increase the threat level to a mandatory evacuation order.

- Increasing the threat level to a mandatory evacuation order: reduces stress for seniors, enhances and increases effective communication, and also allows emergency officials can facilitate and gain more control over the at-risk disaster area.

What are the implications of lower compliance with both mandatory and voluntary orders among males than among female seniors?

- The implication of older male adults creates a level of complexity. If older males do not evacuate when orders have been issued, staying in the at-risk area could put more people at risk (emergency officials assisting individuals to safety).
- If older adult males prolong their stay in an at-risk area, their delay in evacuating could have an increasing effect on emergency evacuation funds.
- The delay in evacuation among older adult males could put undue stress on the individual as well as the emergency officials. They might not have all the disaster resources and transportation available if they delay their evacuation.

What are implications of such a tendency to be more-strongly evident among African American and Native American elders and elders with college degrees?

- Finding methods to address the cultural differences and lower education levels via media messages and/or literature.
- Emergency officials should have knowledge of language barriers, cultural differences, and lower education levels among older adults.

Practical Implications

The study findings suggest there are some practical implications to address.

Older adults are more likely to respond to a mandatory order than a voluntary request.

Since older adults have a higher compliance to a mandatory evacuation order, there are several measures to be taken to ensure the safety of older adults. The methods below have provided some evidence of assisting older adult populations in the event of a disaster:

Voluntary Registries

- Emergency officials should coordinate services with local Area Agencies on Aging (AAA) to provide assistance with voluntary registries of older adults who may need evacuation assistance. If local AAA's already have in place registries of their older adult participants, then continual update of the voluntary registry is necessary for an effective disaster evacuation.

SWiFT Rapid Triage Tool (Dyer, Regev, Burnett, Festa, & Cloyd, 2008)

- Seniors Without Families Team (SWiFT) tested the feasibility of triaging vulnerable older adults with medical, mental health, financial, and social needs. The 13-item SWiFT tool is a feasible approach for triaging vulnerable older adults and provides a rapid determination of the level of need or assistance necessary for vulnerable older people during disasters. Emergency Officials can use this tool to for a rapid assessment of the vulnerabilities of older adults in the event of a disaster. This assessment tool has a Spanish version as well.

Door to Door Approach (Kelly & Gowen, 2003)

- Fire and/or law enforcement officials should go door to door, or neighborhood to neighborhood with loudspeakers is a necessity. This strategy has been proved to be effective. Older adults will likely have a more positive response to the personal assistance from emergency officials. According to Kelly & Gowen, 2003, sheriff's deputies went house to house to warn any remaining residents of the need to evacuate and to identify those who required further assistance. The door to door approach had a 98 percent evacuation rate of older adults.

Cultural & Religious Barriers (Cross, 1989; & Giger & Davidhizar, 1999)

- An understanding of how older adults' culture and religion can help avoid misunderstandings and miscommunication. Older adults within a particular culture may react to imminent danger or seek assistance in different ways, depending on their degree of acculturation. Developing cultural competence requires a concerted effort by emergency officials and other emergency disaster planners (Cross, 1989). To meet this culture commitment, emergency officials should understand their own cultures and world views; examine their own attitudes, values, and beliefs about other cultures; acknowledge cultural differences; and work to understand how cultural differences affect the values, attitudes, and beliefs of others. Emergency Officials should have a comprehensive community profile that describes the community's composition

- Emergency officials should also understand the important considerations when interacting with older adults with different cultural and religious beliefs. Giger and Davidhizar (1999) developed a training *cultural assessment and intervention model* that provides assistance in the provision of cultural nursing care. The model identifies five issues (communication, personal space, social organization, time, and environmental control) that can affect the interactions of providers and evacuation recipients. This training model can be used to assist emergency officials understand the cultural barriers they may face in the event of a disaster. Emergency officials should recognize the time and devotion of energy to gain acceptance within these communities. Take advantage of associations with trusted organizations, and be wary of aligning emergency efforts with those agencies and organizations that are mistrusted by cultural groups (DHHS, 2000).

Language Barriers (Goode et al., 2001)

- Language can be a major barrier to provide assistance in a disaster. Nearly 14 percent of the Nation's population—32 million people—speak a language other than English in their homes. More than 300 languages are spoken in the United States (Goode et al., 2001). Many older adults frequently do not speak English well, if at all. This presents communication challenges throughout all phases of a disaster.
- Recruitment of community representatives based solely on race, ethnicity, or language may not be sufficient to ensure an effective response in the event of a disaster. The ability to speak a particular language is not necessarily associated with cultural competence. For example, a well-educated, Spanish-speaking Hispanic professional may not understand the problems and cultural nuances of an immigrant community whose members are living in poverty (DHHS, 2000). To aid in an effective evacuation, emergency officials should have basic pictures or drawings depicting how and what these individuals should do to overcome language barriers.

Recommendations for Further Study

Consistent with the limitations and implications of the current study, future research studies should focus on respondents drawn from both rural and urban populations who are isolated-homebound older adults. It is apparent to study isolated-homebound older adults with evacuation needs. These isolated-homebound older adults may rely more heavily on assistance from others, rather than older adults who

can physically attend senior/community centers. A comparison of these two groups of older adults, both senior center participants and isolated homebound individuals, would provide further knowledge and a greater understanding of needs older adults face in the event of a disaster.

Further research studies are also needed regarding older adults:

- Replication of this study by using a larger sample of older adults, both rural and urban respondents.
- Examine the language barriers, cultural and religious characteristics among older adults regarding disaster evacuation.
- Identify and examine the extent of preparation and readiness of older adults regarding disasters.
- Identify existing measures that Emergency Government Officials have set in place within local communities to ensure the safety and needs of older adults are met in the event of a disaster.
- Identify the responsibilities and information emergency government officials generate to influence the willingness to evacuate among older adults in the event if a disaster.
- Examine the level of training standards of emergency government officials with regard to the knowledge and understanding of needs older adults might have in the event of a disaster.
- Compare and examine the voluntary and mandatory compliance scales to both populations; older adults and younger adults.

APPENDIX A
RESEARCH CONSENT FORM

University of North Texas Institutional Review Board

Informed Consent Form

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose and benefits of the study and how it will be conducted.

Title of Study: The willingness to evacuate among older adults in the event of a disaster.

Principal Investigator: Amy Gray, a graduate student in the University of North Texas (UNT) Department of Applied Gerontology.

Purpose of the Study: You are being asked to participate in a research study which involves the examination of community-dwelling older adults' willingness to evacuate in the event of a disaster among with regard to Emergency Government officials and Mass Media.

Study Procedures: You will be asked to participate in the completion of a disaster evacuation survey that will take approximately 10 minutes of your time.

Foreseeable Risks: No foreseeable risks are involved in this study.

Benefits to the Subjects or Others: We expect the project to benefit you, other older adults, Emergency Government Officials, and Mass Media by providing Emergency Government Officials and Mass media personnel with a better understanding of older adults' willingness to evacuate in the event of a disaster.

Compensation for Participants: You will receive a ticket for a chance to receive a basic personal disaster kit as compensation for your participation. Compensation is conditioned upon on completing all tasks requested.

Procedures for Maintaining Confidentiality of Research Records: Adherence to all surveys will be kept completely and strictly confidential. All participation records will be maintained in a locked non-transparent box in a separate location than were the survey is being conducted. All surveys will be coded uniquely by using letters and numbers per recruitment site to preserve anonymity among surveys.

Questions about the Study: If you have any questions about the study, you may contact Amy Gray, at telephone number xxx-xxx-xxxx or the faculty advisor, Dr. Keith Turner, University of North Texas, Department of Applied Gerontology, at telephone number xxx-xxx-xxxx.

Review for the Protection of Participants: This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB

can be contacted at (940) 565-3940 with any questions regarding the rights of research subjects.

Research Participants' Rights: Your signature below indicates that you have read or have had read to you all of the above and that you confirm all of the following:

- Amy Gray has explained the study to you and answered all of your questions. You have been told the possible benefits and the potential risks and/or discomforts of the study.
- You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw will involve no penalty or loss of rights or benefits. The study personnel may choose to stop your participation at any time.
- You understand why the study is being conducted and how it will be performed.
- You understand your rights as a research participant and you voluntarily consent to participate in this study.
- You have been told you will receive a copy of this form.

Printed Name of Participant

Signature of Participant

Date

For the Principal Investigator or Designee: I certify that I have reviewed the contents of this form with the participant signing above. I have explained the possible benefits and the potential risks and/or discomforts of the study. It is my opinion that the participant understood the explanation.

Signature of Principal Investigator or Designee

Date

APPENDIX B
DISASTER EVACUATION SURVEY

Disaster Evacuation Survey

1. Your Gender (please select):

Male Female

2. Your Age (please select):

60-69 70-79 80 and over

3. Your Marital Status (please select):

Married Widowed Separated Divorced Never Married

4. To which Ethnic Origin group do you most closely belong? (please select):

White, Non-Hispanic African American Hispanic Asian
 American Indian / Alaskan Native Other

5. Highest educational level achieved (please select one):

Grade school or less Junior High School or some High School High School Degree
 some college but less than 1 year 1 or more years of college no degree College Degree Completed (eg. BX, BA)

6. Have you ever experienced a disaster situation? YES NO

7. Have you ever had to evacuate your home in a disaster? YES NO

Please circle the number that represents how much you agree or disagree with the following statements:	1=Strongly Disagree	2=Disagree	3=Neutral	4=Agree	5=Strongly Agree
I would comply with a VOLUNTARY EVACUATION REQUEST from:					
8a Law Enforcement Officers	1	2	3	4	5
8b TV news alert	1	2	3	4	5
8c Military / National Guard	1	2	3	4	5
8d Radio News Alert	1	2	3	4	5
8e Neighbors	1	2	3	4	5
8f Fire Department	1	2	3	4	5
8g Mayor / Governor	1	2	3	4	5
8h American Red Cross`	1	2	3	4	5
8i Church Officials	1	2	3	4	5
8j Local Emergency Management.	1	2	3	4	5

Please circle the number that represents how much you agree or disagree with the following statements:	1=Strongly Disagree	2=Disagree	3=Neutral	4=Agree	5=Strongly Agree
I would comply with a MANDATORY EVACUATION ORDER from:					
9a Law Enforcement Officers	1	2	3	4	5
9b TV news alert	1	2	3	4	5
9c Military / National Guard	1	2	3	4	5
9d Radio News Alert	1	2	3	4	5
9e Neighbors	1	2	3	4	5
9f Fire Department	1	2	3	4	5
9g Mayor / Governor	1	2	3	4	5
9h American Red Cross`	1	2	3	4	5
9i Church Officials	1	2	3	4	5
9j Local Emergency Management.	1	2	3	4	5

10. Have you ever been told by emergency officials to evacuate your home?

- YES If yes, please answer 11 & 12 NO If no, please skip to 13.

11. Who in the past told you to evacuate your home? (Please check all that apply).

- | | |
|--|--|
| <input type="checkbox"/> Law Enforcement Officer | <input type="checkbox"/> Mayor / Governor |
| <input type="checkbox"/> TV News Alert | <input type="checkbox"/> American Red Cross |
| <input type="checkbox"/> Military / National Guard | <input type="checkbox"/> Church Officials |
| <input type="checkbox"/> Radio news alert | <input type="checkbox"/> Local Emergency Management |
| <input type="checkbox"/> Neighbors | <input type="checkbox"/> Other (please indicate) _____ |
| <input type="checkbox"/> Fire Department | <input type="checkbox"/> Have not been told to evacuate |

12. Did you follow the advice of those emergency officials to evacuate your home?

- YES NO

13. Please note the destination to which you would evacuate and how you would get there in the following disasters:

	Destination	How would you get there?
Tornado	_____	_____
Flood	_____	_____
Fire	_____	_____
Chemical Spill	_____	_____

14. Members of a household should have basic items in the event of a disaster. These items include: bottled water, extra medication, clothing, & ready-to-eat meals to last for three days.

Do you already have all of these items? NONE YES, some YES, all

15. Have you already assembled these items in one location? YES NO

APPENDIX C
DISASTER EVACUATION SURVEY FLYER

Disaster Evacuation Survey

Conducting survey in your area in August 2008!

See Site Manager for Details!!!



Voluntary Participation

Survey participation will take approximately
10-15 minutes.

Co-Sponsored by:

The University of North Texas, Applied Gerontology
Department & COEDD Area Agency on Aging



APPENDIX D
SITE MANAGER TRAINING MANUAL

UNIVERSITY OF NORTH TEXAS

Department of Applied Gerontology



**Disaster Evacuation Survey
Training Manual**
Principal Investigator—Amy Gray

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Purpose of Disaster Evacuation Survey

The purpose of this study is to examine community-dwelling older adults' willingness to evacuate among Mass Media and Emergency Government Officials in the event of a disaster. This training manual has been developed to:

- Provide basic guidelines and procedures to administer the survey in an accurate manner.
- Developed to ensure that respondents personal privacy is respected.

Identifying Eligible Respondents

To be *eligible* means to *qualify* for something. An eligible respondent is someone who is qualified to be included in our survey. The eligible respondent is a community dwelling person who is 60 years of older.

Ethics and Confidentiality

Institutional Responsibilities

The rights of human subjects are a matter of primary concern to all research study sites. All research studies, using human subjects, are legally and ethically responsible for the safety and well-being of study subjects. Study procedures are reviewed by the Institutional Review Board (IRB) to ensure that individual participants are protected at each stage of research.

Individual Responsibility

To ensure confidentiality, this survey must be administered by Amy Gray or the Site Manager in chare of the Community Center. Each individual must make every effort to protect the anonymity and confidentiality of participants. Each Site Manager performs a professional task when they obtain information from individuals, and they are expected to maintain **professional ethical standards of confidentiality** regarding what they hear, see, or collect from a participant:

1. All information about participants obtained during the course of the research study is privileged information whether it relates to the study itself or includes extraneous observations concerning the participants.
2. Such information is not to be discussed with anyone but Primary Investigator (**Amy Gray-XXX-XXX-XXXX**).
3. A breach of confidentiality is a serious violation.
4. It is very important that you never conduct a research study with someone you know as a: relative, friend, neighbor, or someone you remotely know. The participant may feel you are judging him and therefore not respond honestly to the questions. Everyone is entitled to a confidential survey. Knowing the participant could compromise confidentiality and the integrity of the study. Basically, if you know the respondent either personally or through a friend or relative, you can not disseminate information to that person.

Informed Consent

Informed consent is critical to research. It means that the person, who is agreeing to participate in the survey, has clearly heard and understood:

1. Who you are (*State your name*)
2. Who is doing the research? (*The University of North Texas*)
3. What the study is about (*disaster evacuations*)
4. What is expected of study participants (time, future contact, any other burden or perceived burden) (*10 minutes, no perceived burden*)
5. Participation is **voluntary**
6. Participant can refuse to answer any question(s)
7. All information is confidential in a locked file box.

University of North Texas Institutional Review Board

Informed Consent Form

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose and benefits of the study and how it will be conducted.

Title of Study: The willingness to evacuate among older adults in the event of a disaster.

Principal Investigator: Amy Gray, a graduate student in the University of North Texas (UNT) Department of Applied Gerontology.

Purpose of the Study: You are being asked to participate in a research study which involves the examination of community-dwelling older adults' willingness to evacuate in the event of a disaster among with regard to Emergency Government officials and Mass Media.

Study Procedures: You will be asked to participate in the completion of a disaster evacuation survey that will take approximately 10 minutes of your time.

Foreseeable Risks: No foreseeable risks are involved in this study.

Benefits to the Subjects or Others: We expect the project to benefit you, other older adults, Emergency Government Officials, and Mass Media by providing Emergency Government Officials and Mass media personnel with a better understanding of older adult's willingness to evacuate in the event of a disaster.

Compensation for Participants: You will receive a ticket for a chance to receive a basic personal disaster kit as compensation for your participation. Compensation is conditioned upon on completing all tasks requested.

Procedures for Maintaining Confidentiality of Research Records: Adherence to all surveys will be kept completely and strictly confidential. All participation records will be maintained in a locked non-transparent box in a separate location than were the survey is being conducted. All surveys will be coded uniquely by using letters and numbers per recruitment site to preserve anonymity among surveys.

Questions about the Study: If you have any questions about the study, you may contact Amy Gray, at telephone number XXX-XXX-XXXX or the faculty advisor, Dr. Keith

Turner, University of North Texas, Department of Applied Gerontology, at telephone number XXX-XXX-XXXX.

Review for the Protection of Participants: This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-3940 with any questions regarding the rights of research subjects.

Research Participants' Rights: Your signature below indicates that you have read or have had read to you all of the above and that you confirm all of the following:

- Amy Gray has explained the study to you and answered all of your questions. You have been told the possible benefits and the potential risks and/or discomforts of the study.
- You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw will involve no penalty or loss of rights or benefits. The study personnel may choose to stop your participation at any time.
- You understand why the study is being conducted and how it will be performed.
- You understand your rights as a research participant and you voluntarily consent to participate in this study.
- You have been told you will receive a copy of this form.

Printed Name of Participant

Signature of Participant

Date

For the Principal Investigator or Designee: I certify that I have reviewed the contents of this form with the participant signing above. I have explained the possible benefits and the potential risks and/or discomforts of the study. It is my opinion that the participant understood the explanation.

Signature of Principal Investigator or Designee

Date

APPENDIX E
INSTITUTIONAL REVIEW BOARD (IRB)
APPROVAL LETTER

July 1, 2008

Amy Gray
Department of Applied Gerontology
University of North Texas

Re: Human Subjects Application No. 08-215

Dear Ms. Gray:

As permitted by federal law and regulations governing the use of human subjects in research projects (45 CFR 46), the UNT Institutional Review Board has reviewed your proposed project titled "The Willingness to Evacuate among Older Adults in the Event of a Disaster." The risks inherent in this research are minimal, and the potential benefits to the subject outweigh those risks. The submitted protocol is hereby approved for the use of human subjects in this study. **Federal Policy 45 CFR 46.109(e) stipulates that IRB approval is for one year only, July 1, 2008 to June 30, 2009.**

Enclosed is the consent document with stamped IRB approval. Please copy and **use this form only** for your study subjects.

It is your responsibility according to U.S. Department of Health and Human Services regulations to submit annual and terminal progress reports to the IRB for this project. Please mark your calendar accordingly. The IRB must also review this project prior to any modifications.

Please contact Shelia Bourns, Research Compliance Administrator, or Boyd Herndon, Director of Research Compliance, at extension 3940, if you wish to make changes or need additional information.

Sincerely,



Kenneth W. Sewell, Ph.D.
Chair
Institutional Review Board

KS:sh

CC: Dr. Keith Turner

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