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PSYCHOSOCIAL CORRELATES OF POST-TRAUMATIC STRESS DISORDER SYMPTOMS AND

WELL-BEING AMONG HISPANIC WORLD TRADE CENTER

RESCUE AND RECOVERY WORKERS

by

DIANNE CIRO

A dissertation submitted to the Graduate Faculty in Social Welfare in partial fulfillment of the

requirements for the degree of Doctor of Philosophy, The City University of New York

2018

Psychosocial Correlates of Post-Traumatic Stress Disorder Symptoms and Well-Being Among

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This manuscript has been read and accepted for the Graduate Faculty in Social Welfare

in satisfaction of dissertation requirement for the degree of

Doctor of Philosophy.

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ABSTRACT

Psychosocial Correlates of Post-Traumatic Stress Disorder Symptoms and Well-Being among

Hispanic World Trade Center Rescue and Recovery Workers

by

Dianne Ciro

Advisor: Harriet Goodman, DSW

Thousands of first responders are estimated to have endured extremely distressing experiences during their recovery efforts at the 9/11 World Trade Center (WTC) site. While the effects of 9/11 continue to be studied, few studies have examined how rescue and recovery workers have been coping since 9/11 and how their coping is associated with their psychological well-being. Moreover, we do not know how distinct coping patterns may be associated with post-traumatic growth, experiences of positive emotion, or quality of life among WTC responders.

This study compared coping differences among Hispanic, Non-Hispanic White, and Non-Hispanic Black first responders. In addition, it examined the relationship between their coping, Post-Traumatic Stress Disorder (PTSD) symptoms, and psychological well-being. I also examined these associations in Hispanic responders by language preference and US nativity as proxies of acculturation.

Data from a cohort of 4,148 WTC responders who attended monitoring visits at the Mount Sinai WTC Health Program (WTC-HP) and who participated in a web-based survey administered by the Mount Sinai WTC Mental Health Program research team were used for secondary data analyses. More specifically, I utilized multiple regression analyses to compare differences in coping among Hispanics, Non-Hispanic Whites, and Non-Hispanic Blacks, while controlling for WTC-related trauma exposure, demographics, and clinical and psychosocial characteristics. Data were also used to examine the relationship between the responders' coping, PTSD symptoms, and psychological well-being. Further, I used the data to examine differences in coping and well-being (e.g., post-traumatic growth, positive affect, and quality of life) in Hispanic responders by language preference and US nativity. Last, I tested a moderation effect to examine the relationship between active coping, PTSD symptom levels, and well-

being among Hispanic responders by their level of acculturation using language preference and US nativity as proxies.

Key findings suggested broad similarities in coping between Hispanic and Non-Hispanic Black first responders, significant differences in coping among Hispanics, and the prevalence of post-traumatic growth in Hispanic responders. Further, the results revealed a moderating effect of US nativity on the Hispanic responders' experiences of positive affect and quality of life.

This study's results are consistent with other study findings that show Hispanic ethnicity is associated with higher PTSD symptom levels in 9/11 first responders. However, the study findings also show that positive religious coping and active coping are strongly associated with post-traumatic growth in Hispanic first responders. Further, positive religious coping and perceived social support are strongly associated with Hispanic responders experiencing positive affect and reporting a higher quality of life. Finally, the study findings demonstrate that US nativity among Hispanic responders moderates the relationship between active coping and positive affect and between active coping and quality of life, suggesting that Hispanic responders who are born abroad and use active coping report higher rates of positive affect and quality of life than those who are US born. Clinical and policy implications of these findings are of importance in designing programs for this population.

ACKNOWLEDGMENTS

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CHAPTER 1: INTRODUCTION

The September 11, 2001 (9/11) attacks on the World Trade Center (WTC) in New York City and the Pentagon in Washington, DC were unprecedented in the United States. Upwards of 50,000 people are estimated to have participated in the rescue and recovery efforts at the WTC site alone (Wisnivesky, 2011). While large groups of people were and still are affected by the disaster, there are those who felt the effects more directly than others and for longer periods. In the disaster literature, Wright (1990) refers to these most affected groups as the "disaster community." This community consists of different subgroups of people that branch out from the affected population. Disaster workers and volunteers, such as the rescue and recovery workers who responded to the WTC disaster, are a prominent component of this overall community, encompassing what Wright (1990) calls the ''service'' and ''support'' providers (p. 39-40). Rescue and recovery workers require special attention, because they are a highly exposed community and at high risk to develop both physical illness and injury and psychological distress because of their efforts (Bills, 2009; Neria, 2011; Perrin, 2007; Stellman, 2008).

From professional and training perspectives, the WTC first responder population was highly diverse, including fire fighters, police officers, and paramedics. Moreover, it included rescue and recovery workers with no prior training in disaster relief, such as construction workers, asbestos cleaners, and general maintenance workers. Among this first responder population, Hispanics represented the second largest ethnic group at 31% compared to 57% of White Americans (Wisnivesky, 2011).

Along with associated health risks, studies suggest that WTC first responders were at higher risk of developing long-term psychological problems than were other highly exposed WTC populations (Beringer, 2010; Bills, 2009; Neria, 2011; Perrin, 2007; Stellman, 2008;

Wisnivesky, 2011). This included individuals who were in the New York City Disaster Area in lower Manhattan and the northwest parts of Brooklyn on 9/11 or who lived, worked, or went to school or day care in the area for the weeks and months that followed. While these individuals also were affected by the WTC attacks of 9/11, they did not experience the same exposures (Neria, 2011). WTC first responders received ongoing exposure to a variety of severely traumatic events. Some witnessed the scene in the immediate aftermath, some lost coworkers in the disaster, and some worked directly with the bereaved or searched for family members. Many stayed at the WTC site for months working long shifts under dangerous conditions in the recovery effort (Bills, 2008; de la Hoz, 2008). The most commonly documented mental health conditions seen in those exposed to the traumatic events of 9/11 are Post Traumatic Stress Disorder (PTSD), trauma-related anxiety and depressive disorders, and substance abuse problems (Bills, 2008; Neria, 2011; Smith, 2004). These results suggest that the effects of the tragic events of 9/11 led to pervasive mental health problems among many first responders (Bills, 2008; Neria, 2011; Smith, 2004).

However, a preliminary review of relevant databases including PubMed, Medline, EbSCO, and PsychInfo produced few studies that examined how first responders coped differentially with the stressors of working at the WTC site. One study provided a qualitative analysis of the occupational roles, exposures, attitudes, and experiences of first responders at Ground Zero following the 9/11 terrorist attacks (Bills et al., 2009). Another study reported on the values, social, and emotional characteristics shared among firefighters, police officers, journalists, and chaplains who participated in the WTC rescue and recovery efforts (Freedman, 2004). Furthermore, few studies examined specific sub-categories of the first responder population, such as Hispanic WTC rescue and recovery workers, regarding either stress or

coping. The current study focused on Hispanic responders' coping and how their coping related to their PTSD symptoms and well-being.

Research examining the events of 9/11 has used ethnicity as a predictor variable of mental health outcomes among WTC first responders (e.g., Adams & Boscarino, 2005; Bills, 2008; de la Hoz, 2008; Wisnivesky, 2011) and has found that Hispanic WTC rescue and recovery workers are at higher risk for PTSD. However, to date only one study examined how WTC first responders are coping since September 2011 (Feder et. al., 2016). Moreover, no studies examined the relationship between the Hispanic WTC first responders' coping and their psychological well-being.

An in-depth examination of the coping strategies used by Hispanic rescue and recovery workers since 9/11 is especially important for two reasons. First, a growing number of first responders continue to develop 9/11-related illnesses (Wisnivesky, 2011), and a large number of them identify as Hispanic (Wisnivesky, 2011). Second, the Affordable Care Act (ACA) helped many Hispanic first responders who lacked access to public or private health insurance coverage due to their disabilities that resulted from their WTC exposure (de la Hoz, 2008). However, under the new administration, they may again be at risk for lack of access to healthcare benefits. A large number of Hispanic first responders seen in the WTC Health Program (WTC-HP) are at risk of losing their health insurance benefits. This makes it important for social workers and other mental health professionals at the Mount Sinai WTC Health Program and the other WTC-HP clinical centers of excellence to understand how Hispanic WTC first responders have been coping since 9/11. This study examined the coping strategies used among WTC first responders and their association with different psychosocial factors of well-being with a focus on Hispanic first responders by language preference and US nativity.

Coping with the Effects of 9/11

Over the past several decades, there has been increasing interest in the concept of coping. Several definitions and classification systems of coping have been proposed (e.g., Hobfoll et al., 1994; Hobfoll, 1998; Holahan et al., 1996; Lazarus & Folkman, 1984). Lazarus and Folkman (1984) defined coping as an individual's ''efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person'' (p. 141). Effective service of the mental health needs of Hispanic WTC first responders requires a better understanding of how they have been coping since 9/11. Understanding how Hispanic rescue and recovery workers cope will inform the development of culturally congruent treatment interventions.

Coping in Hispanic WTC Responders

Many of the Hispanic rescue and recovery workers seen at the Mount Sinai WTC-HP are first-generation immigrants who reported moving to the US in search of financial prosperity. They have few economic resources, which limits their access to health and mental health care (de la Hoz, 2008). In addition, most immigrants experience difficulties triggered by migration, discrimination, socioeconomic disadvantage, a collapse in social supports, acculturation, and learning a second language (Fuertes, 2005). Despite extensive literature on the mental health needs of Hispanic immigrants, the research on coping and appraisal processes among Hispanic immigrants remains scarce (Abraido-Lanza, 2004; Fuertes, 2005). There is some evidence that Latino homeowners prefer to utilize friends and family as sources of information and disaster preparation (Peguero, 2006). Similarly, a qualitative descriptive study examining the health concerns of Latinos who resided in the path of Hurricane Katrina revealed that Latinos relied primarily on informal social networks for information, assistance, and support prior to, during,

and after Katrina (Messias & Lacy, 2007).

Further, a survey of 1,805 Hispanic Americans over age 55, the majority of whom were of Mexican, Cuban, or Puerto Rican heritage, found that individuals were twice as likely to seek help from the church than from any other community service organizations when addressing family problems, depression, worry, or fear (Starrett et al., 1992). Additionally, in a systematic review of research on religion and spirituality conducted between 1990 and 1999, Weaver et al. (2003), discussed the mental health benefits of religious practice and belief for Hispanic Americans. Moreover, a study of how older Hispanic immigrants in New York City coped with traumatic stressors including 9/11; the Iraq war; the death of a relative; the existence of civil and political unrest in their native countries, primarily in Central and South American countries; the crash of Flight 587 from New York City bound for the Dominican Republic; and family trauma found that Hispanic immigrants reported high rates of using avoidance, religion, and acceptance as forms of coping (Strug et al., 2009). This study also found that Hispanic immigrants differed from a comparable group of US-born older adults in the type of stressor reported, response to that stressor, and ways of coping (Strug et al., 2009). However, little is known about the extent to which religious coping, social support, and other forms of coping are associated with the psychological well-being of Hispanics who worked at the WTC site during the rescue and recovery efforts.

Theories of stress and coping provide a venue to explore varying reactions to adverse events such as the WTC rescue and recovery efforts. Most people experience at least one violent or life-threatening event over the course of their lives (Breslau et al., 2000; Copeland et al., 2007; Kessler et al., 1995), but not everyone confronted with such events reacts the same way (Bonnano, 2004; Bonanno et al., 2012; Hobfoll, 2007; Lazarus, 1966). Some people may seek

support from family and friends, while others may look for help from a professional mental health worker. Some may problem-solve themselves in response to a stressful situation, and others may rely on their faith to manage a difficult time. A diversity of coping responses to potentially traumatic events seems obvious. However, until recently trauma researchers and theorists have paid relatively little attention to the full range of possible reactions exposed individuals might express (Bonanno, 2004; Bonanno et al., 2012; Ibanez, 2004).

This study sought to explore the differences in coping among WTC first responders by race/ethnic groups. A second focus of this study examined the relationship between the Hispanic WTC first responders' coping responses and their psychological well-being. Asking Hispanic rescue and recovery workers to appraise their lives and discuss how they were coping since 9/11 allows mental health providers at the WTC-HP to have a better understanding of their coping style, which in turn can help these mental health professionals develop culturally relevant interventions. This inquiry added to the existing coping literature by answering the following questions:

1) How did coping strategies reported by WTC first responders vary by race/ethnicity?

2) How did the three most commonly reported coping strategies among WTC first responders and their relationship to posttraumatic growth, positive affect, and quality of life vary among Hispanic, White Non-Hispanic, and Black Non-Hispanic responders?

3) What were the three most commonly used coping strategies among Hispanic WTC first responders by language preference and US nativity?

4) What was the correlation between the Hispanic WTC first responders' coping and their psychological well-being by language preference and US nativity?

To answer these questions, I organized the chapters as follows. Chapter 2 is a review of

historical, theoretical, and empirical literature. Chapter 3 presents the study methodology. Chapters 4 through 7 present the results for each study aim. Chapter 8 is a discussion of the study results and addresses the study limitations and implications for practice and research.

CHAPTER 2: LITERATURE REVIEW

The literature reviewed in this chapter includes writings on disaster trauma and its psychological effects on first responders with a focus on the 9/11 WTC first responders. I also present the Western concept of trauma, including the formulation of Post-Traumatic Stress Disorder (PTSD). I emphasize theories of stress and coping and review the literature on differential cultural-coping patterns, research on resilience, and the influence of Hispanic culture on coping.

Much of the literature suggests that social support and religious coping are prevalent among Hispanics. There are mixed findings on the use of active coping and its effectiveness among Hispanics. Hence, this review and study will focus on these coping styles. The review includes both theoretical and empirical literature examining these concepts in preparation for this dissertation's data analyses. My intention is to contribute to the understanding of how Hispanic WTC first responders are coping. Consequently, the chapter begins with a definition of terms used throughout the manuscript.

Definition of Terms

A disaster is a tragic, unpredictable event that occurs suddenly causing great loss of life, damage, or hardship. There are many definitions of disaster, but a common feature is that the event overwhelms local resources and threatens the function and safety of the community (Quarantelli, 1985; Quarantelli, 1995). Furthermore, while some suggest that all disasters are human-made because they are often a result of human action or inaction, disasters are often differentiated between the "natural" and "human-made" hazards that cause them (Quarantelli, 1985; Quarantelli, 1995).

Natural Disasters

A natural disaster often results from a natural hazard affecting humans or the built environment. Human vulnerability and lack of resources can lead to financial, environmental, or human impact. Various phenomena, such as earthquakes, landslides, volcanic eruptions, floods, and cyclones, are considered natural hazards that can kill thousands of people and destroy their habitats (Bankoff et al., 2003; Peek & Mileti, 2002).

Human-made Disasters

In contrast, human-made disasters often are caused by technological or human hazards. Examples include stampedes, fires, transport accidents, industrial accidents, oil spills, and nuclear explosions/radiation. Acts of war or terrorist attacks, such as those of 9/11, are also considered human-made disasters. Acts of terrorism are examples of human-made disasters of mass violence (Ursano, 2003; Waugh, 2007). These are difficult for both victims and rescuers to comprehend and assimilate, resulting in feelings of helplessness, anxiety, and vulnerability (Comer, 2007; Marshall, 2007; Neria, 2011). Events such as the attacks on the World Trade Center towers are referred to as terrorism, because they are intended to erode the security and safety of a community and cause great psychological distress (Comer, 2007; Marshall, 2007; Neria, 2011).

The terrorist attacks in New York City on September 11, 2001 resulted in one of the largest death tolls of any disaster in the US (CDC, 2002). Approximately 3,000 people were killed in New York City alone, and thousands were injured (Freedman, 2004; Galea et al., 2002; Schlenger et al., 2002). The psychological and physical enormity of 9/11 was impossible to comprehend. Emergency personnel, fire fighters, police, and other responders from the five boroughs of New York City rushed to the first WTC tower that had been struck. Sirens were

blaring, lights were flashing, and moments later, a second plane hit the second tower. This is

when the realization took hold that ''we were under attack.'' The heightened noise, running,

screaming, and frightened people created a scene of chaos that became an iconic historical event.

In this dissertation, the terms "September 11" and "9/11" will be used interchangeably to

reference the attacks of September 11, 2001. Furthermore, "the WTC attacks," "WTC disaster,"

and "terrorism" will be used to reference the attack on the World Trade Center towers on

September 11, 2001.

Traumatic Events

A traumatic event may evoke terror, fear, helplessness, or horror in the face of a threat to

life or serious injury (American Psychiatric Association, 1984). Traumatic events may stun,

terrify, and disrupt communities (Ursano et al., 2003). Communities exposed to disasters

experience multiple traumatic events including threats to life, loss of property, exposure to death,

and, often, economic devastation (Bankoff et al., 2003; Comer, 2007; Marshall, 2007; Neria,

2011; Peek & Mileti, 2002). In this study, I use the WTC attack on 9/11 and its associated

exposures to examine how the WTC first responders have coped with the traumatic events of

9/11.

First Responders

Prior to 9/11, a common assumption was that skilled support personnel, such as crane

operators and construction workers, were not necessary in the immediate aftermath of a disaster

when police, fire fighters, and emergency medical technicians were engaged in actual rescue

operations. However, in response to the massively devastating WTC attack, thousands of civilian

workers arrived at Ground Zero shortly after the buildings collapsed and remained at the site for

many months. Many of these skilled support workers participated in traditional first-responder

activities for which they were not trained (Perrin, 2007). As a result, a large number of these personnel experienced exposure to the same or similar potentially traumatic stressors as trained first responders were. For purposes of this dissertation, I refer to both trained and untrained rescue and recovery workers collectively as first responders and examine them as a group in the data analyses.

Hispanics

The terms "Hispanic" and "Latino" often are used interchangeably to describe the same group of people. However, there are noted differences between the two. The term "Hispanic" refers to a group of people who share the Spanish language, culture, history, and heritage. In contrast, "Latino" refers to persons and communities of Latin American origin (Marrow, 2003). While there is a significant overlap between the groups, they are different. For example, Brazilians are an example of Latinos who are not Hispanic (Marrow, 2003). In this study, some of the analyses compared differences in coping among Hispanic, Non-Hispanic White, and Non-Hispanic Black first responders. Other analyses focused on Hispanics by language preference and US nativity. Latinos were not included in the data analyses, because they do not all speak Spanish or share the same culture, history, or heritage.

According to the 2014 census, there were an estimated 55 million Hispanics living in the US, which made them the nation's largest ethnic minority (Colby & Ortman, 2015). Further, the Hispanic population is projected to increase from 55 million in 2014 to 119 million in 2060, which is an increase of 115%. According to this projection, the Hispanic population will constitute 28.6% of the nation's population by 2060 (Colby & Ortman, 2015). The rapid growth of Hispanics living in the US makes it important for mental health professionals to understand the mental health needs of Hispanic people, including WTC first responders.

Psychological Effects of Disaster

By definition, disasters overwhelm institutions, health care services, and social resources. It may take individuals and communities months or years to recover from them (Quarantelli, 1985; Quarantelli, 1995). Natural disasters strike without notice. Human-made disasters, such as transportation disasters, factory explosions, and school shootings have become a common part of modern-day life (Ursano et al., 2003). Large-scale terrorist attacks are a particular type of disaster. They are human acts of intentional interpersonal violence that cause extreme psychological distress (Eisenman et al., 2009; Ursano et al., 2003).

The World Trade Center attack on 9/11 vividly demonstrates the strong psychological and social responses engendered by terrorism (Eisenman et al., 2009; Galea et al., 2002; Koplewicz et al., 2002; Luce et al., 2002; North et al., 2002; Schuster et al., 2001; Ursano et al., 2003). They had a profound impact on a nation's beliefs and values (Jernigan & Schlenger, 2003; Ursano et al., 2003). Terrorism destroys the sense of safety and creates terror in individuals, communities, and nations. The deliberate infliction of pain and suffering experienced in a terrorist attack is a particularly potent psychological stressor.

In a nationally representative survey in the US conducted the week after the 9/11 terrorist attacks, 44% of the adults reported one or more substantial symptoms of stress, and 90% reported at least low levels of stress symptoms (Schuster et al., 2001). A second study conducted within the first two months after the attacks (Galea et al., 2002) found that in New York City, the prevalence of PTSD was 7.5%, and the prevalence of depression was 9.7%. Overall, an estimated 13.6% of the population reported symptoms that met criteria for either PTSD or depression, and 3.7% reported symptoms that met criteria for both disorders. A national study conducted during the same period found that rates of probable PTSD were 11.2% in New York

City, 2.7% in Washington, DC, 3.6% in other metropolitan areas, and 4.0% in the balance of the country (Schlenger et al., 2002).

Although many people experienced the effects of the 9/11 attacks, there are those who felt the effects more directly and for a longer period than others did (Eisenman et al., 2009; Ursano et al., 2003). These most-affected groups consist of different subgroups of people that branch out from the affected population. Disaster workers and volunteers, such as the rescue and recovery workers who responded to the WTC disaster, are a prominent subgroup of this overall community because of their increased exposure from working at the WTC site.

Further, while research conducted in the past decade demonstrates that the burden of 9/11-related PTSD is substantial for both the short and the long term, the burden has not been consistent across highly exposed populations (Neria, 2011). Although overall PTSD levels in the community declined significantly over time after 9/11, prevalence estimates of PTSD increased over time in a number of specific risk groups. For example, in a large cohort of rescue and recovery workers studied longitudinally, PTSD prevalence increased significantly over the first six years post-9/11, reaching 19.5% at five to six years post-9/11 (Brackbill et al., 2009). Similarly, the prevalence of PTSD among a large sample of retired fire fighters was found to reach a level of 22% approximately five years after the attacks (Chiu et al., 2011).

Psychological Effects of Disaster on First Responders

Study of the psychological effects of disaster on first responders has dramatically increased in the past several decades. This developing literature suggests that first responders are at increased risk of experiencing psychological trauma (Fullerton, 1992; Neria, 2011; Perrin, 2007; Stellman, 2008; Ursano, 1999). Research shows that first responders are often exposed to both the stress of the event itself and the stress of their roles as help providers (Fullerton et al.,

1992) and while responding to a disaster, they may become its hidden victims. They are exposed repeatedly to mutilated bodies, mass destruction, life-threatening circumstances, and physically demanding situations (Bills, 2008; Bills, 2009; Fullerton, 1992; Ursano, 1999; Wright, 1990).

The Psychological Effects of 9/11 on First Responders

The experiences of the first-responder community at the WTC site span from witnessing the attacks first-hand to working long hours and coming into contact with families of the victims. After the WTC attacks on 9/11, the media termed the World Trade Center site "Ground Zero," while the rescue and recovery workers referred to it as "The Pile." The 9/11 WTC first responders' exposures at Ground Zero ranged from inhaling smoke, exposure to dust, fires, rubble, dead bodies, body parts, personal artifacts, smells, and evacuations (Bills, 2009).

In addition to unsafe physical and chemical environmental conditions, these workers were exposed to unprecedented and potentially traumatic psychological stressors. These stressors included fear for personal safety, injury or illness, working long hours, performing arduous work in chaotic conditions, the loss of colleagues and friends, handling body parts, and inhaling the odor of decomposing bodies and debris (Landrigan et al., 2004; Neria et al., 2006; Pietrzak et al., 2014). Data from initial monitoring visits at the World Trade Center-Health Program collected within three years after the 9/11 attacks found that 11.1% of responders screened positive for PTSD, 8.8% for depression, 5.0% for panic disorder, and 62% for a substantial stress reaction (Pietrzak et al., 2014; Stellman et al., 2008). Data from the WTC Health Registry, collected two to three years after the disaster, similarly revealed a 12.4% prevalence of PTSD among WTC responders, ranging from 6.2% for police to 21.2% for unaffiliated volunteers (Perrin et al., 2007; Pietrzak et al., 2014).

Western Concepts of Exposure to Traumatic Events

Scholars have noted that in our attempt to understand how people cope with traumatic events and to arrive at universally applicable interventions, we seldom consider whether our understanding of mental health has useful application among all cultures (Becker, 1995; Honwana, 1999; Isakson, 2008; Watters, 2010; Watters, 2011). On the individual level, PTSD has become the hallmark diagnosis used to define the psychological effects of exposure to traumatic events. In 1980, the Third Edition of the Diagnostic and Statistical Manual (DSM-III) of the American Psychiatric Association included an agreed-upon definition for PTSD (American Psychiatric Association, 1980). Since then, the American Psychiatric Association has revised the PTSD diagnostic criteria, with the most recent adaptation appearing in Fifth Edition of the Diagnostic and Statistical Manual (DSM-V) (American Psychiatric Association, 2013). In the DSM-V version, PTSD is included in a new category, Trauma and Stressor Related Disorders (American Psychiatric Association, 2013). PTSD has been defined as a serious condition that can develop following exposure to a traumatic or stressful event. The characteristic symptoms resulting from this exposure include persistent re-experiencing of the traumatic event, persistent avoidance of stimuli associated with the trauma, negative thoughts or feelings that began or worsened after the trauma, and trauma-related arousal and reactivity that began or worsened after the trauma (American Psychiatric Association, 2013). The full symptom picture must be present for more than 30 days, and the disturbance must cause clinically significant distress or impairment in social, occupational, or other important areas of functioning. Last, the symptoms cannot be due to medication, substance use, or another illness. This new definition of PTSD also includes two specifications: dissociative specification (e.g., experience of being an outside observer or being detached from oneself and experiencing unreality, distance, or distortion) and

delayed specification (e.g., the full diagnostic criteria are not met until at least six months after the trauma, although onset of symptoms may occur immediately) (American Psychiatric Association, 2013).

Prior to this new formulation of PTSD, most mental health professionals and trauma researchers used the DSM-IV PTSD diagnostic criteria. However, the symptom criteria of PTSD noted in the DSM-IV and DSM-V generally are comparable. Some of the differences include, the exclusion of "the unexpected death of family or close friend due to natural causes" (DSM-IV, p. 464) from the list of qualifying traumatic events; the diagnosis no longer requiring that the response to a traumatic event involve intense fear, hopelessness, or horror; the separation of the avoidance and numbing cluster into two separate criteria in the DSM-V; and the addition of two new symptoms, "negative thoughts or feelings that began or worsened after the trauma" and "trauma-related arousal and reactivity that began or worsened after the trauma" (DSM-V, p. 271).

Recent changes in the diagnostic criteria reportedly have had minimal effect on prevalence. National estimates of PTSD prevalence suggest that *DSM-V* rates were only slightly lower (typically about 1%) than were *DSM-IV* for both lifetime and past-12 month (Kilpatrick et al., 2013). When cases met criteria for *DSM-IV* but not *DSM-V*, this was due primarily to the revision excluding sudden unexpected death of a loved one from the PTSD symptom criteria in the *DSM-V*. The other reason was a failure to have one avoidance symptom. When cases met criteria for *DSM-V* but not *DSM-IV*, this was due primarily to not meeting *DSM-IV* avoidance/numbing and/or arousal criteria (Kilpatrick et al., 2013). Research also suggests that similarly to *DSM-IV*, prevalence of PTSD for *DSM-V* was higher among women than men were and increased with multiple traumatic event exposure (Kilpatrick et al., 2013).

However, most of the research providing support to this new rendition of PTSD developed mainly with treatment-seeking Western samples (Rosen, 2008). Furthermore, the processing of a traumatic event and life thereafter reflects the survivor's appraisal and interpretation of the event, and this meaning often is drawn from their culture. The human body's visceral reactions to traumatic events are primal and include adrenaline, fear, and the fight-or-flight response. Consequently, some assume that the effects of such events would be the same among all cultures. However, some scholars note that Western ideas of health and wellness may not adequately describe the psychic experience of people from non-Western cultures and their reactions to traumatic events (Becker, 1995; Honwana, 1999; Isakson, 2008; Watters, 2010; Watters, 2011).

For example, Latin American clinician David Becker found the Western diagnostic formulation of PTSD inadequate to describe the experiences of Latin American survivors of state-sponsored violence in Chile (1995). Similarly, existing coping literature illustrates that while stress and coping are universal experiences faced by individuals regardless of culture, ethnicity, and race, members of different cultures might consider and respond to stressors differently with respect to coping goals, strategies, and outcomes (Chun, Moos, & Cronkite, 2006; Kuo, 2011; Lam & Zane, 2004).

Theoretical Literature

The range of reactions people experience when confronted with violent events has led to different theories regarding peoples' capacity to cope with such experiences. Furthermore, varying ways of understanding coping have arisen. Much contemporary coping research traces back to Lazarus's (1966) Transactional Model of Stress and Coping. In his model, Lazarus presents a contextual approach to stress and coping that places great emphasis on the role of

cognitive appraisal (e.g., how an individual views a situation). This theory suggests that cognitive appraisal shapes the quality of the individual's emotional response to a troubled person-environment relationship and to the ways in which the person copes with the appraised relationship.

In 1993, Lazarus described coping as a process that includes two major functions: problem-focused coping and emotion-focused coping. The function of problem-focused coping is to change the troubled person-environment relationship by acting on the environment or on oneself. Conversely, the function of emotion-focused coping is to change either the way the stressful relationship with the environment is attended to (e.g., avoidance) or the relational meaning of what is happening, which mitigates the stress even though the actual conditions of the relationship have not changed (e.g., reappraisal). Figure 1 illustrates this coping process and provides examples of strategies used in problem-focused coping and emotion-focused coping.

Figure 1: Transactional Model of Stress and Coping Diagram

Problem Focused:
•Information seeking
•Problem solving
•Taking control

Emotion Focused:
•Reapprasing the stressor in a positive light
•Using distractions
•Systematic relaxation procedures
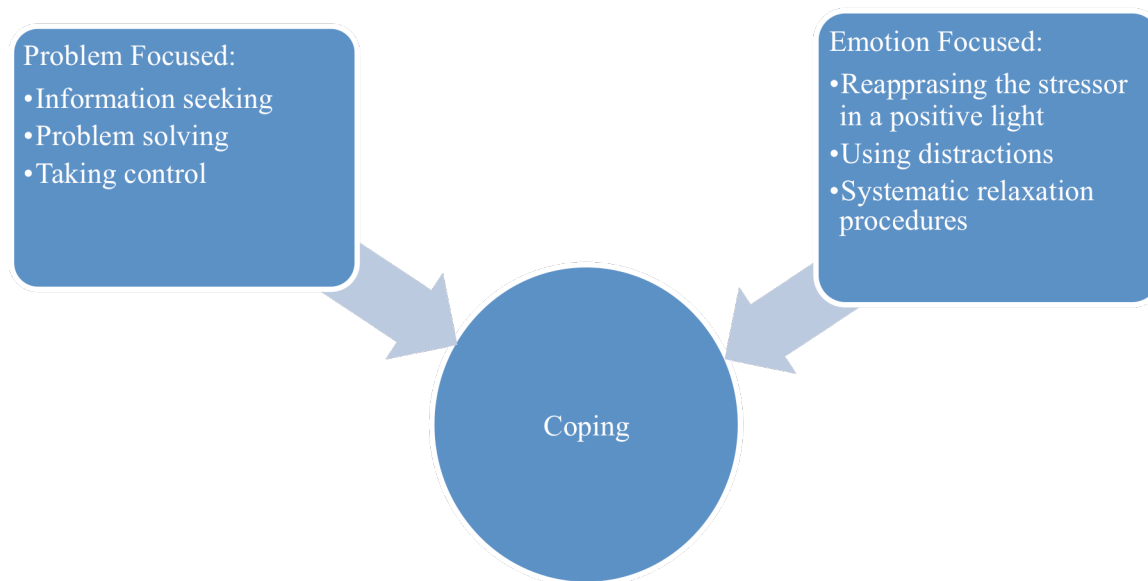
Coping

Figure 1. An illustration of the Transactional Model of Stress and Coping. The square on the left, labeled Problem Focused denotes one of the two functions of coping and provides examples of such function. The square on the right, labeled Emotion Focused denotes the other function and provides examples of this function. Adapted from Lazarus, R. S. (1966). *Psychological stress and the coping process*. New York: McGraw-Hill.

Lazarus's formulation of coping includes a wide range of cognitive and behavioral responses that ordinary people use to manage and address the problems of daily life that cause distress. These responses include eight forms of problem- and emotion-focused coping, which include confrontive coping [e.g., "stood my ground and fought for what I wanted"]; distancing [e.g., "tried to forget the whole thing"]; self control [e.g., "I tried to keep my feelings to myself"]; seeking social support (e.g., "accepted sympathy and understanding from someone"); accepting responsibility (e.g., "realized I brought the problem to myself"); escape-avoidance (e.g., "slept more than usual"); planful problem solving (e.g., "I made a plan of action and followed it"); and positive reappraisal (e.g., "changed or grew as a person in a good way")

(Folkman & Lazarus, 1988). Confrontive coping and planful problem solving are examples of problem-focused coping and the others are examples of emotion-focused coping. However, Lazarus distinguishes between coping style and process. Folkman et al. (1986) found that some coping styles are consistent and others are inconsistent across stressful encounters, thus implicating a personality trait in the coping process. Further, Lazarus also suggests that coping changes from one time to another in any given stressful encounter.

While Lazarus and Folkman (1986) suggest that the coping effort is independent of the outcome, Folkman et al. (1985) found that a coping strategy that produces positive outcomes in one context or in one person might not do so in another. Lazarus identified this as a limitation of the coping-process approach. Although process approaches encompass specific coping thoughts and actions in diverse stressful contexts that call for coping, the coping strategies usually do not apply to everyone. For example, a particular belief system, life pattern of plans, and social connections may influence coping strategies (Lazarus, 1993).

Conservation of Resources

Hobfoll (1989) expanded on Lazarus's theory and proposed conceptualizing stress using the Conservation of Resources Model (COR). This resource-oriented model supposes that people strive to retain, protect, and build resources; what is threatening to them is the potential or actual loss of these valued resources, including object resources, conditions, personal characteristics, and energies (Hobfoll, 1989). Hobfoll suggested people either employ resources that they already possess or call on additional resources available from the environment to offset resource loss or resource gain. While this formulation of COR theory was consistent with the advances in understanding the biological, cognitive, and social bases of stress responding, there was a call for

envisioning COR theory and the stress process within a more collectivist backdrop than was first posited (Hobfoll, 2001).

Scholars have criticized these initial coping theory models. Some characterized them as mono-cultural perspectives that are entrenched in the Western, individualistic values of North America where most of the research was conducted (Hobfoll, 2001). The models emphasize personal control, agency, and direct action (Folkman & Moskowitz, 2004). In addition, this highly individual and intrapersonal stance of the stress-coping literature has led some to criticize its overly "a-contextual" view of coping (Folkman & Moskowitz, 2004, pp. 753-754) and its neglect of culture as a fundamental context of coping (Chun et al., 2006).

Multi-Axial Model of Coping

These criticisms led Hobfoll to expand his original theory, and he introduced the Multi-Axial Model of Coping (1998). This new perspective considers ''the social, interdependent nature of coping,'' as well as its individualistic aspects (Hobfoll, 1998, p. 121). By acknowledging the collectivistic or sociocultural nature of coping, Hobfoll broadened what traditionally was a narrow view of coping. It provides a framework that allows examination of how people from non-Western, collectivistic cultures may cope in the face of stressful situations.

Prior to Hobfoll's Multi-Axial Model of Coping, the interest in social aspects of coping focused mainly on support seeking (Carver et al., 1989). While researchers found that active prosocial coping strategies, such as seeking support relate to less psychological distress (Kaniasty & Norris, 1993; Kaniasty & Norris, 2000), Hobfoll (1996) suggested that social coping might also include coalition building, social joining, and protecting others. It was not until the mid-1990s that coping measures included these social aspects of coping. The Multi-Axial Model of Coping addresses the cultural biases found in an individualistic perspective by stating that

coping strategies fall somewhere along a continuum of three axes of coping behaviors. The axes

depend on context and include active/passive, prosocial/antisocial, and directness/indirectness.

The active/passive axis denotes the extent to which a coping strategy is action-oriented in

responding to a problem that an individual confronts. The prosocial/antisocial axis refers to the

extent that a person interacts with others in order to cope with a situation. The

directness/indirectness axis refers to whether the person's coping activity directly or indirectly

applies to the problem (Hobfoll, 1998; Hobfoll, 2002). Furthermore, the model is based on the

assumption that the three axes are relatively independent of each other, and thus one individual's

approach can be active-prosocial-indirect whereas another's might be active-prosocial-direct.

Hence, the multi-axial model of coping allows for the examination of a variety of approaches to

coping.

While much of the early coping theory and research is devoted to understanding how

people regulate negative emotions to adjust to negative events, an emerging body of theory and

research in the 1990s focused on the regulation of positive emotions as a way to feel good in the

present and into the future. For example, Fredrickson (1998) introduced the Broaden-and-Build

Theory of Positive Emotions, suggesting that over time the skills and resources built by positive

emotion and broadened behavior enhance survival. She argued that positive emotions, such as

enjoyment, happiness, joy, and interest, broaden a person's awareness and encourage novel,

varied, and exploratory thoughts and actions (Fredrickson, 1998; 2001; Tugade et al., 2004).

Over time, this broadened behavioral repertoire builds skills and resources that lead to

psychological well-being and resilience.

Study Theoretical Framework

I employ Hobfoll's multi-axial model of coping as the theoretical framework for my

dissertation to acknowledge the cultural context of coping and to examine the varied approaches to coping in WTC first responders. Further, considering the innate resilience of the WTC first responders, this dissertation will also use Fredrickson's Broaden-and-Build Theory to guide the study. The WTC first responders' resilience was exemplified by both their work in the recovery efforts and because some had decided to leave their native countries in search of a better life and future.

Empirical Literature on Culture and Coping

The past two decades have witnessed a significant growth in research and the knowledge base of culture and coping and an increased call by scholars for more culturally and contextually informed stress-coping paradigms (Kuo, 2011). Several comparative coping studies have provided evidence of differential cultural-coping patterns. Palinkas et al. (1992) conducted an ethnographic study of the Exxon Valdez oil spill. They found that cultural differences played an important role in determining the psychosocial effects of a technological disaster, particularly with respect to exposure, appraisal of the event as stressful, perceived family support as a moderator of the stress, and depressive symptoms among Alaskan Native and Euro-American residents in 13 communities of Alaska. Specifically, this study found that although equal proportions of Natives and Euro-Americans resided in the areas affected by the oil spill, significantly greater percentages of Natives than Euro-Americans reported participation in the cleanup activities, mitigating damage to commercial fisheries and effects of subsistence activities, such as fishing and hunting. Although Natives were more likely than Euro-Americans to report damage to commercial fisheries resulting from the spill, such damage was associated with depressive symptoms in Euro-Americans but not Natives. On the other hand, the income earned from the oil spill cleanup activities was associated significantly with depressive

symptoms among Natives but not among Euro-Americans. The researchers found that the Natives appraised the income earned from their cleanup efforts as a source of stress, because it led to increased social differentiation and cultural conflicts.

Palinkas and colleagues found the non-resident cleanup contractor who hired local workers sometimes gave positions of leadership to younger persons who were to supervise older residents and this caused strains in the family relationships and work crews. This was because the cultural values suggested the elder members of the work crew were the ones who should be in charge and earning the higher wages instead of for those in supervisory positions. However, the increased social conflict among Natives was not correlated with a decline in perceived family support, while the social conflicts among Euro-Americans was associated with a decline in perceived family support. Moreover, perceived family support was not inversely associated with a decline in social relations or depressive symptoms in either ethnic group. However, such support buffered the effects of exposure on depressive symptoms in Euro-Americans but not in Natives (Palinkas et al., 1992).

In another study, Kaniasty et al. (2000) examined the role of ethnicity in seeking social support after Hurricane Andrew. They found that seeking social support was a strong predictor of receiving social support. However, notwithstanding many similarities among White, Black, and Latino ethnic groups, the effects of ethnicity differed according to the context. In emergencies, all groups reported similarly high levels of seeking social support and receiving support. In non-emergency situations, seeking social support declined for Blacks and Whites but not for Latinos. Further, although all ethnic groups reported receiving less social support in non-emergency situations, Latinos reported receiving dramatically less support than Blacks and Whites in both contexts.

More recently, Strug et al. (2009) studied how older Hispanic immigrants in New York City coped with traumatic stressors such as 9/11, the Iraq war, the death of a relative, the existence of civil and political unrest in their native countries, the crash of Flight 587 from New York City bound for the Dominican Republic, and family trauma. They found Hispanic immigrants differed from a comparable group of US-born older adults in ways of coping. Both Hispanic immigrants and US-born non-Hispanics scored highest on the use of avoidance coping strategies (e.g., trying not to talk about the event) and the use of religion (e.g., "I have been praying or meditating") as a mode of coping on the Brief COPE. Other comparatively high scores were for use of acceptance coping strategies (e.g., "I learned to live with it"). By contrast, the mean scores for active coping were much lower (e.g., "I concentrated my efforts on doing something about" and "I took an action to make it better"). However, in comparison to US-born non-Hispanic adults, Hispanic immigrants scored higher on the self-distraction, emotional support, active coping, and planning subscales. The study findings also found that language made a difference in predicting how older adults reacted to a stressor, including 9/11. Hispanic Spanish speakers were more likely to report being wary of the environment and avoided expressing their stress-related fears and anxieties.

Further, in an exploratory study of the impact of 9/11 on elderly Chinese and Hispanic immigrants in New York City, Strug and Mason (2007) found that older Chinese and Hispanic immigrants (mostly Dominican) reacted to 9/11 in distinct, culture-bound ways, which helped them cope with this traumatic event. For the Chinese, cultural values associated with social connections played an important role in coping with 9/11, while for Hispanics the belief in destiny was significant. In another qualitative study, Constantine, Alleyne, Caldwell, McRae, and Suzuki (2005) interviewed Asian, Black, and Hispanic Americans living in New York to

explore how they coped with the aftermath of the 9/11 terrorist attacks. Participants enrolled in the study expressed experiencing a range of emotions (i.e., sadness, anger, anxiety). They employed avoidance behaviors and sought support from or gave support to family, friends, colleagues, and peers. However, Blacks and Hispanics endorsed more religious coping (e.g., attending church), while Asians endorsed more acceptance of the event because of fate or a spiritual higher power as their coping with the posttraumatic stress. Apparently, idiosyncratic cultural characteristics on coping based on ethnicity are observable even in the face of momentous events.

Hispanic Culture and Coping

Hispanic culture is a relevant psychosocial factor in understanding coping processes (Anez, 2008; Ford, 2008; Roche, 1999; Zayfert, 2008) among Hispanic WTC first responders. Researchers found Hispanics rely on *confianza* (trusting relationships) and reciprocity in their efforts to address their mental health needs (Anez, 2008; Harari, 2008; Viladrich, 2007). *Familismo* (family attachments), *respeto* (respect), *personalismo* (personal familiarity), *marianismo* (cultural prescriptives assigned to women), *machismo* (maleness), and *fatalismo* (fatalism) are other cultural constructs that may be inherent in how Hispanics express and cope with distress (Anez, 2008; Roche, 1999; Zayfert, 2008). However, different mental health profiles among different subgroups of Hispanics complicate this picture (Alegria et al., 2008). Nevertheless, recognizing and understanding the link between cultural values and behavior is important to understanding how Hispanic WTC first responders cope. Furthermore, having insight on the cultural constructs that influence their coping can inform mental health clinicians' treatment interventions (Anez, 2008; Dana, 1998; Roche, 1999).

There is growing consensus that integrating Hispanic cultural constructs in their mental health care is integral in their mental health outcomes (Andres-Hyman, 2006; Anez, 2008; Roche, 1999; Zayfert, 2008). However, perhaps because of the wide range of ethnic subgroups within the Hispanic community, writings in this area often provide brief and cautious recommendations embedded in broader theoretical discussions (Andres-Hyman, 2006; Rojas-Guyler et al., 2008; Salazar & Valdez, 2000; Vasquez, 1998). Few suggestions emerge from the literature about how these cultural constructs may be inherent in Hispanics' coping or how to apply them to treatment with diverse Hispanic subgroups. Furthermore, most studies that attempt to understand the mental health needs and help-seeking behaviors of Hispanics by ethnic origin have focused primarily on Mexicans and Puerto Ricans and have used the variables of race and ethnicity as indicators of susceptibility to mental health problems.

Culturally sensitive researchers and clinicians serving Hispanic WTC first responders need a better understanding of how Hispanics cope with traumatic events such as the attacks of 9/11 in order to adapt treatment approaches and services that will support this population's well-being. One study found examined the coping responses of Asian, Black, and Hispanic New York City residents following the September 11, 2001, attacks (Constantine et al., 2005). A second study compared older Chinese and Hispanic immigrants regarding how they reacted and coped with September 11 (Strug & Mason, 2007). A third study examined how older Hispanic immigrants in New York City reacted and coped with 9/11 stress compared to US-born older adults (Strug et al., 2009). However, no studies examined coping among Hispanic WTC first responders. Current theoretical discussions on the integration of cultural constructs in the mental health care of Hispanics neglect to capture the mental health needs of Hispanics as a diverse group, which call for examination of the mental health needs of Hispanic WTC first responders.

The Influence of Acculturation on Coping

The influence of acculturation on coping is particularly pertinent to this inquiry given the significant number of first-generation Hispanic immigrants who worked at the WTC site during the rescue and recovery efforts. Preliminary coping studies of immigrant and international students have suggested a relationship between cultural divergence in coping and acculturation levels. Mena, Padilla, and Maldonado (1987) studied coping patterns among immigrant college students in the US across four generations. In the study, the first generation respondents were immigrants to the US; the second generation respondents were born in the US, but had two foreign born parents; third and later generations were born in the US and had both parents also born in the US; and mixed-generation respondent were born in the US, had one US and one foreign born-parent. These researchers found that late immigrants used more active coping strategies than did early and later generation immigrants. Second- and third-generation immigrants adopted more social network coping than did first- and mixed-generation immigrants. The researchers explained that higher acculturation among second- and third-generation individuals afforded them more interpersonal and social resources in times of stress.

Some scholars suggest that in terms of cultural adaptation, active coping skills facilitate the cultural transactions thought to be a key determinant to mental health (LaFromboise, Coleman, & Gerton, 1993). However, there are mixed findings on the effectiveness of active coping among Hispanics. Some studies have found that active coping is associated with decreased depression among Hispanics (Crocket et al., 2007; Torres & Rollock, 2007). In contrast, Lee and Liu (2001) found that problem-focused coping, which is considered a form of active coping, negatively exacerbated stress for Hispanic American college students facing family conflict. Similarly, Gonzales, Tein, Sandler, and Friedman (2001) examined the influence

of active coping on depression and found that these skills buffered individuals during low levels

of family stress but did not appear to be as effective when experiencing high levels of family

stress. This suggests that the context and types of stressors experienced may influence the role of

coping including the level of distress in which these skills are protective.

Further, while the health and social sciences widely use the concept of **acculturation** to

explain various health and behavioral outcomes, a review of the empirical research literature

highlights disagreement about ways in which **acculturation** is measured. Numerous researchers

use Berry's model (Berry, Trimble, & Olmeda,1986) to explore the issue of acculturation, but

those who try to empirically verify the model have met with mixed results (e.g., Ben-Shalom &

Horenczyk, 2003; Bhui et al., 2005; Koch et al., 2004). Cohen (2010) suggests that the

paradoxical results in the research that is conducted using Berry's model (i.e., Koch et al., 2004)

may stem from Berry's four categories (Integration, Assimilation, Separation, and

Marginalization) not differentiating between the two different relationships that affect the

immigrant community. Instead, Cohen (2010) proposes that the immigrant community has a

significant impact on the individual immigrant's acculturation process. The host culture and the

home culture also influence the process. The many debates among researchers suggest that the

influence of acculturation is complex, uncertain, and uncharted. This gap in knowledge affects

how clinicians understand and are able to offer culturally relevant treatment interventions to

Hispanics. The current study targets this uncharted territory.

Hispanics and Religious Coping

Despite the deficit in knowledge about the coping of Hispanic WTC responders to the

traumatic events of 9/11, some evidence suggests that religious coping is prominent among

Hispanics (Abraido-Lanza et al., 1996; Abraido-Lanza et al., 2004; Connell & Gibson, 1997; Ell

& Haywood, 1985; Plante et al., 1995; Rabinowitz et al., 2009; Simoni & Ortiz, 2003). Religious coping involves the use of cognitive or behavioral strategies based on religious beliefs or practices (e.g., praying, seeking comfort, or strength from God) and is differentiated from both religiosity and other non-religious coping strategies. Consistent with recent research about other Hispanic coping strategies, studies have found that religious coping can have both positive and negative effects on mental and physical health during stressful periods (Abraido-Lanza, 2004; Pargament, 1997; Rabinowitz, 2009).

Positive religious coping involves viewing religion and spirituality of great support in response to significant external stressors (e.g., ''I think of my life as part of a larger spiritual force,'') (Pargament, 1997). Negative religious coping, however, involves feeling alienated or in conflict with God as a consequence of dealing with stressful life events (e.g., "I've been wondering if God has abandoned me" and "I've been expressing anger at God for letting this happen to me,") (Pargament, 1997). Some studies reveal that positive religious coping is associated with decreased cumulative health risks among Hispanic females with arthritis (Abraido-Lanza, 2004) and increased psychological well-being among Hispanic female caregivers of elderly relatives with dementia (Rabinowitz, 2009). However, no studies found for this review allow causal inference, nor do any provide a longitudinal examination of religious coping on health outcomes. Further, few studies examine the extent to which religious coping is associated with psychosocial adaptation among Hispanic survivors of traumatic events.

Social Support as a Mode of Coping among Hispanics

Studies suggest that Hispanics in the US may pursue other forms of coping consistent with their cultural values and worldviews. They may seek social support and assistance from family members, close friends, and other valued members of their interpersonal network

(Abraido-Lanza et al., 1996; Constantine et al., 2005; Gargurevic et al., 2010; Ibanez et al., 2004; Plante et al., 1995; Viladrich, 2007). The cultural priority of using close relationships when attempting to cope with problems reflects a communal or collectivist worldview (Kaniasty & Norris, 2000; Markus & Kitayama, 1991). Thus, collectivistic coping strategies generally are viewed as behaviors used within peer, family, community, and other close relationships. They require individuals to engage meaningfully with others when attempting to cope with problems, and to consider important others' well-being in the context of sharing or discussing problems or concerns (Kaniasty & Norris, 2000; Markus & Kitayama, 1991). A study (Gargurevic et al., 2010) examining resilience factors among survivors of a fire in Lima, Peru, found that dependency, that is, the ability to form close relationships and the ability to give and receive affection, positively predicts social-emotional support. This study indicates that perceived emotional support is a mediator between personality and PTSD symptoms (Gargurevic et al., 2010). Furthermore, it allows for resilience in a potentially and universally traumatic community event (Falicov, 2002; Ozbay et al., 2008; Sippel et al., 2015).

Resilience

A growing body of evidence suggests that adults exposed to potentially traumatic events can be resilient. Stress resilience has emerged as an important construct in understanding variability in individual responses to stressful and traumatic situations. The American Psychological Association defines resilience as "the process of adapting well in the face of adversity, trauma, tragedy, threats, or even significant sources of stress" (American Psychological Association, n.d.). Early studies of children exposed to significant adversity (Masten & Coatsworth, 1998; Masten, 2001; Rutter, 1985) and later studies of resilient adults (Ahmad et al., 2010; Alim et al., 2008; Bonanno, 2004; Feder et al., 2009; Johnson et al., 2011;

Pietrzak et al., 2009) have identified a range of personal and psychosocial characteristics associated with adaptation to stress and trauma. Some have connected active coping and social support to greater resilience in contrast to avoidant coping behavior and behavioral disengagement (Southwick et al., 2005). In a nationwide Web-Based survey of psychological responses to September 11, active coping is associated with more adaptive outcomes, while the reverse is true for coping by denial and disengagement/giving up (Silver et al., 2002). Optimism and the capacity to experience positive emotions alongside negative ones in the face of trauma have been found to promote adaptive coping, greater flexibility of thought, and decreased physical stress responses, such as autonomic activation (Fredrickson, 2001; Ong et al., 2006; Tugade et al., 2004). Other characteristics of resiliency include the capacity for cognitive reappraisal of traumatic events to achieve a new, more adaptive perspective; the ability to harness support from others; having a strong sense of purpose, including religious beliefs; and the ability to find meaning in adversity (Alim et al., 2008; Feder et al., 2009; Pargament, 2000; Pietrzak et al., 2009; Pietrzak & Southwick, 2011; Southwick et al., 2005).

Most studies conducted in the aftermath of trauma exposure focus on risk factors associated with pathological outcomes such as PTSD and depression. Personal characteristics related to stress resilience receive minimal attention in the disaster literature. A range of studies in trauma-exposed populations, however, show that resilience is the most common response in trauma-exposed individuals, and that a significant proportion of individuals are able to recover after experiencing initial stress-related symptoms (Alim et al., 2008; Bonanno et al., 2011; Southwick et al., 2005). However, no study found for this literature review examines the range of personal characteristics and psychosocial factors associated with resilient outcomes for Hispanics in traumatic events, let alone for Hispanic WTC first responders.

Central Research Question

Although there is extensive literature that describes common sequelae experienced by survivors of disaster and on coping and adjustment among people who have experienced disasters (Bonanno et al., 2006; Constantine et al., 2005; Ibanez et al., 2004; Strug & Mason, 2007), empirical research on the coping mechanisms of Hispanic 9/11 first responders is non-existent. Moreover, at this time there do not appear to be studies exploring how Hispanic first responders' coping affects their well-being. There are studies (Bills et al., 2009; Freedman, 2004) that describe the values and social and emotional characteristics of first responders and studies that describe those values that affect the health beliefs and perceptions of Hispanics (Abraido-Lanza et al., 1996; Abraido-Lanza et al., 2004; Anez et al., 2008). However, there is no literature linking Hispanic values and differences among them to Hispanic WTC first responders' coping.

Serving the mental health needs of Hispanic WTC first responders requires a better understanding of how they cope with their direct exposure to potentially traumatic events. Developing new insights on the relationship between the Hispanic WTC responders' cultural norms and values, coping, and psychological well-being is at the core of this inquiry. I have presented writings on disaster trauma and its psychological effects on first responders. There is a discussion on the Western concept of trauma, including the formulation of Post-Traumatic Stress Disorder and its amenability to non-Western cultures. Furthermore, there is a review of theories on stress, coping, and resilience, and a review of empirical literature on differential cultural-coping patterns, with an emphasis on Hispanic culture.

The current study is a secondary data analysis conducted to examine differences in coping strategies among WTC first responders by race/ethnicity. Data here also examine how the

coping strategies most commonly used by Hispanic WTC first responders and their association to well-being differs from White Non-Hispanic and Black Non-Hispanic responders. Finally, I examine the relationship between the Hispanic first responders' reported modes of coping and their psychological well-being by language preference and US nativity.

The following chapter describes the methodology utilized in this study and includes an overview of the research sample and a review of the Trajectories Study where data for the secondary data analyses originated. The variables and instrumentation used for this dissertation are outlined. There is also a review of the study aims and the methods used in the data analyses for this dissertation.

CHAPTER 3: METHODOLOGY

This chapter describes the study sample and offers an overview of the "Trajectories of Psychological Risk and Resilience in World Trade Center Responders" (Trajectories Study), where the data for these secondary analyses originated. It also includes a description of the WTC Health Program, the associated clinical centers of excellence, and the WTC Data Center, which stores clinical data on first responders' annual monitoring visits. I provide a summary of the study variables and instrumentation used, and an outline of the study aims and hypotheses. Last, there is an explanation of the statistical analyses used in this dissertation.

Sample

The WTC Health Program (WTC-HP) is a regional clinical consortium comprised of five medical institutions in the greater New York City area, established by the Centers for Disease Control and Prevention (CDC) in 2002 to provide health monitoring and treatment to police and other WTC responders. A separate program is available for New York City firefighters (Berninger et al., 2010) who are not included in this study. WTC responders who worked or volunteered as part of rescue, recovery, restoration, or cleanup in Manhattan south of Canal Street, on barge-loading piers in Manhattan, or at the Staten Island landfill for at least 4 hours from September 11-14, 2001, or 24 hours from September 11 to September 30, 2001, or for >80 hours between September 11 and December 31, 2001 were eligible to enroll in the WTC-HP (Pietrzak, 2012). Once members enrolled in the WTC Health Program, they chose a clinic to visit for medical screening and treatment for their WTC-related medical conditions. Figure 2 shows the structure of the WTC Health Program and the five clinical centers of excellence that responders were able to choose for their care. The Mount Sinai WTC-HP is the largest of the five clinical centers.

Figure 2: World Trade Center Health Program (WTC-HP) Flow Chart
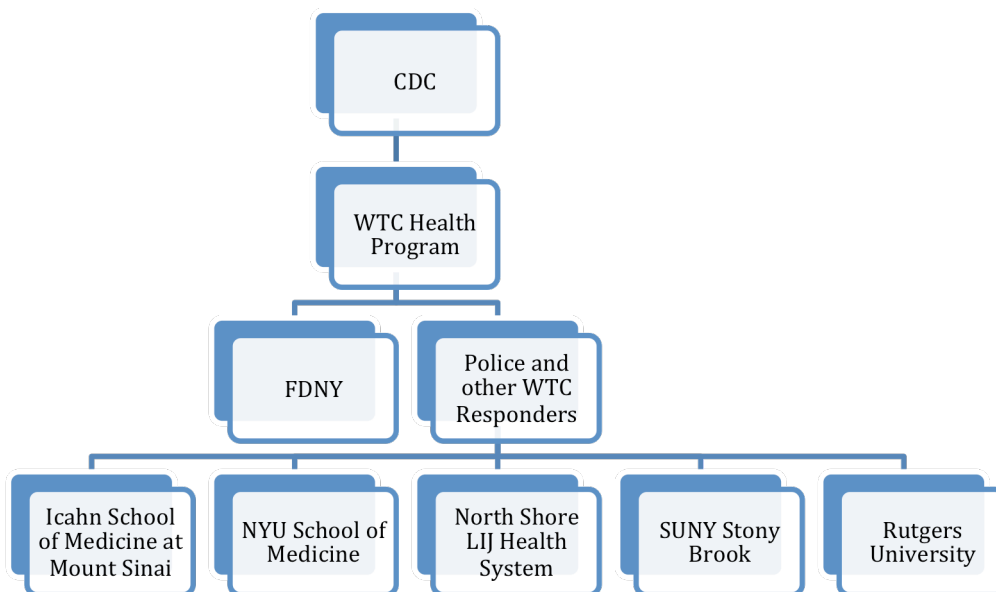
Figure 2. An organizational chart of the WTC Health Program and the five corresponding Clinical Centers of Excellence (CCE) that provide monitoring and treatment services for certified 9/11-related health conditions in the 9/11 WTC rescue and recovery workers. Adapted from World Trade Center Health Program, n.d. https://www.cdc.gov/wtc/about.html.

A research team led by Adriana Feder, MD, at the World Trade Center Mental Health Program at the Icahn School of Medicine at Mount Sinai collected original research data for this secondary data analysis. I combined these data with data derived from the WTC Health Program Data Center drawn from yearly patient monitoring exams that were also collected for research purposes. The latter includes patient responses to self-report questionnaires/scales.

While there are some advantages to using secondary data, there also are some disadvantages. Some of the advantages of using secondary data include its low cost and the time it takes to organize the data (Vartanian, 2010). However, one of the disadvantages to secondary data analysis is that it generaly relies on quantitative databases that orginally were generated for different research purposes. Further, it still requires a researcher to learn the intricacies and the

details of the original database that they are reanalyzing (Yegidis, Weinbech, & Myers, 2011).

The primary concern is that data gathered for one purpose may not have everything that is

needed for a particular secondary study.

Sampling Strategy: Trajectories Study Web-based Survey

Secondary data analyses were conducted using participant responses to a web-based

survey administered by the research team at the WTC Mental Health Program at the Icahn

School of Medicine at Mount Sinai, as part of a longitudinal study examining the trajectories of

WTC-related PTSD symptoms (Stress resistance/resilience, Recovery, Chronic dysfunction, and

Delayed dysfunction) in a cohort of 10,835 WTC responders out of 40,303 responders in the

New York City region. The study did not include FDNY responders. This cohort of 10,835 WTC

responders included 4,035 police responders comprised predominantly (>85%) of New York

City police officers; the remainder were Port Authority police, police from non-New York City

sheriff's offices, and other non-New York City police departments. The 6,800 non-traditional

responders comprised of 40% construction workers, 13% installation/maintenance/repair

workers, 12% security guards and other non-police protective services, 7% transportation

workers, and smaller numbers of workers in a range of heterogeneous occupations, including

engineering, health care, media, administrative and others. At the time of the study, the number

of completed visits among program members at the WTC-HP ranged from 1 to 12. However,

participants included in the Trajectories Study had completed visits 1, 2, and 3 [conducted an

average of 3.3 (S.D.=1.9, range 0.8–8.0), 5.7 (S.D.=1.7, range 3.1–9.0) and 7.9 (S.D.=1.3, range

5.3–10.1) years after 9/11] of the WTC-HP. Eighteen months after their first visit, program

members are eligible to return for a second visit, with subsequent visits scheduled every 18

months thereafter. No one who had not completed at least three periodic health-monitoring visits

(V1, V2, V3) over eight years following 9/11/2001 was eligible for the Trajectories Study. Approximately 29,468 responders seen at the WTC Health Program were not included in the Trajectories Study. Of the 10,835 WTC responders who participated in the Trajectories Study, 6,642 (61.3%) provided written consent at the WTC-HP across all five consortium clinics to be contacted for future studies and were mailed an invitation letter to complete a Web-Based survey between June 2012 and December 2014, with the option of completing a paper-and-pencil version via mail if they did not have access to a computer. Invitation letters were followed up with reminder emails and/or telephone calls to encourage survey completion.

Figure 3: Sampling Diagram

WTC Medical Monitoring Visit → Visit 1: Year 2002-2005; Visit 2: Year 2005-2008; Visit 3: Year 2008-2010 → Clinician Administered Assessment → Trauma Exposure, demographics, clinical and psychosocial characteristics → Web-Based Survey: Year 2012-2014 → PCL, Brief COPE, RSES, MOS-SSS, PTGI-SF, PANAS, Q-LES-Q-SF

Figure 3. An illustration of the sampling strategy used in this study.

Participant responses to the visit 1 (V1) WTC health monitoring assessment, which were collected a median of 2.8 years after 9/11/2001 and the Web-Based survey, administered a median of 12.2 years after 9/11/2001 were merged and used for analysis in this dissertation. Data from monitoring visits 2 and 3 were not included in these analyses, as this study is a cross-sectional study, primarily using data from the Web-Based survey. Of the 6,642 WTC responders mailed an invitation letter to complete the Web-Based survey, 4,487 (67.6%) participated in the Web-Based survey and 4,148 (62.5%) completed the survey. Of those who completed the

survey, 3,198 (77.1%) completed the survey on the Web and 949 (22.9%) completed the paper-and-pencil version; 3,957 (95.4%) completed the survey in English and 191 (4.6%) completed it in Spanish. Survey participants included n=1,760 police responders and 2,388 non-traditional responders, which represents a slightly larger porportion of police and slightly smaller proportion of non-traditional responders in comparison to those who participated in the Trajectories Study.

Inclusion and Exclusion Criteria

All participants who completed the Web-Based survey were included in the subsequent quantitative data analyses comparing differences in coping responses and their associated measures of psychological well-being among WTC responders by race/ethnicity. However, only the responses of subjects who self-identified as Hispanic were included in Hispanic sub-analyses examining the differences between Hispanic responders who completed the survey in English and those who completed the survey in Spanish, as well as those who were born in the US and those born abroad. This criterion disqualified from part of the analyses all participants who did not self-identify as Hispanic.

<div align="center">

Human Subjects Protection

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The "Trajectories of Psychological Risk and Resilience in World Trade Center Responders" study was a project funded by the National Institutes of Occupational Safety and Health (NIOSH) and the Centers for Disease Control (CDC) and was approved by the Mount Sinai School of Medicine Internal Review Board (IRB). The Principal Investigator of the study sent permission (Appendix A) for this researcher to use the data for quantitative data analysis to the Institutional Review Board of Hunter College. The Hunter IRB was informed in writing that the datasets made available had been de-identified for this writer's use. The Hunter College IRB approved this study on September 13, 2014.

Variables and Instrumentation

The Trajectories Study survey included a broad range of previously employed and validated assessment measures in addition to measures of demographic, clinical, and psychosocial characteristics, including number of life stressors before and after 9/11, having a prior psychiatric diagnosis, disaster response experience and preparedness, history of mental health treatment, and type of health insurance. Most of the measures used in the analysis here were drawn from the Web-Based survey. However, WTC-related trauma exposure, sources of family and work support, number of life stressors before and after 9/11, level of perceived preparedness, having a prior psychiatric diagnosis, age, and sex came from the participants' responses to the clinician-administered assessment conducted during the initial WTC-HP monitoring visit. The scales used in these data analyses were associated with dependent and independent variables as part of the analysis.

Dependent Variables

PTSD Symptom Levels. The Post Traumatic Stress Disorder Checklist-Specific Stressor Version (PCL-S; see Appendix B, question 17) contains 17 items corresponding to the three Diagnostic and Statistical Manual of Mental Disorders (DSM–IV; American Psychiatric Association, 1994) symptom clusters of re-experiencing, avoidance, and hyperarousal. Participants were asked in the Web-based survey to indicate how often they have experienced symptoms in the past month in relation to 9/11. Responses to each item are rated using a 5-point Likert scale, ranging from 1 (not at all) to 5 (extremely) to indicate the extent to which respondents had been bothered by that symptom in the past month. The PCL-S is a commonly used and well-validated measure of PTSD (Wilkins et al., 2011) that is also available in Spanish. Scores ≥ 44 have been shown to be an appropriate cut-off for identifying probable PTSD

diagnoses (Ruggiero et al., 2003). The PCL-S was used as a continuous variable in the current study to assess PTSD symptoms related specifically to WTC exposure.

Positive Emotion. The Trait Positive and Negative Affect Schedule (PANAS; see Appendix B, question 6) is a 20-item self-report measure of positive and negative trait affect. Positive affect (e.g., enthusiasm) reflects the extent to which an individual generally experiences pleasurable engagement with the environment, while negative affect (e.g., sadness) reflects the extent to which an individual generally experiences subjective distress and unpleasurable engagement with the environment. Participants were asked in the Web-based survey to circle the descriptions that best described how they felt on average, without specifying a time frame. Responses to each item are rated using a 5-point Likert-type scale ranging from 1 (very slightly or not at all) to 5 (extremely), indicating the extent to which respondents felt each listed emotion. Scores for Positive Affect (PA) and Negative Affect (NA) ranged from 10 to 50, with higher scores indicating more PA and NA, respectively. The alpha reliabilities for the PANAS are acceptably high, ranging from .86 to .90 for PA and from .84 to .87 for NA (Watson et al., 1988). The PANAS also has a Spanish version showing similar psychometric properties to the English version (Robles & Paez, 2003). The PANAS was used in the current study to assess experiences of positive emotion in participants. Mean scores of PA and NA were calculated separately to represent the total number of positive and negative feelings that responders reported generally experiencing and analyzed as a continuous variable (PA score $\geq$ 3.5 was used to reflect a moderate or higher level of pleasurable engagement with the environment and NA score of $\geq$ 3.5 was used to reflect a moderate or higher level of subjective distress).

Life Satisfaction. The Quality of Life Enjoyment and Satisfaction Scale-Short Form (Q-LES-Q-SF; see Appendix B, question 33) was used in this study to assess the WTC responders'

overall life satisfaction in the past week on a variety of general activities, emotions, relationships, and other aspects of well-being. The Q-LES-Q is a reliable, valid, and widely used participant-rated scale designed to measure the degree of enjoyment and satisfaction experienced by participants in their general activities of daily functioning (Endicott et al., 1993; Stevanovic, 2011). The Q-LES-Q-Short Form is composed of 14 general activity items included in the score and two additional items on medication satisfaction. The usual scoring of the Q-LES-Q-SF involves summing only the first 14 items to form a raw total score. The last two items are not included in the total score but rather are stand-alone items. The raw total score then usually is transformed into a percentage maximum possible score by dividing the raw total score (minus minimum score of 14) by maximum score (70 minus 14), providing a final score ranging from 0 to 1. This variable was analyzed as a continuous variable with higher scores suggesting a higher quality of life; however, this scale does not have an established cut-off score suggesting clinical significance. The Q-LES-Q-SF currently is not available in Spanish, so the Mount Sinai WTC-HP Research Workgroup translated the Q-LES-Q-SF using certified translation services.

Posttraumatic Growth. The Posttraumatic Growth Inventory-Short Form (PTGI-SF; see Appendix B, question 15) is a shortened 10-item scale version of the original PTGI instrument that gauges the amount of positive changes that an individual experiences following highly challenging life circumstances. In these data, participants were asked to indicate the degree to which they experienced the listed changes because of their WTC experience. The response scale ranges from 0 (I did not experience this change as a result of my WTC experience) to 5 (I experienced this change to a very great degree as a result of my WTC experience), indicating the extent of change experienced. Although the PTGI-SF has the same 5-factor structure as the PTGI, only the total score is used to assess growth. The PTGI-SF total score has shown good

internal reliability (alphas around .90) across multiple samples (Cann, Calhoun, Tedeschi, Taku et al., 2010). There is no established cut-off score for the PTGI-SF; however, existing research using the PTGI-SF has used moderate or greater growth as a "cut-off" indicative of posttraumatic growth (Feder et al., 2008; Kaler et al., 2011; Triplett et al., 2011). Total scores range from 0 to 50. In the current study, respondents were asked to indicate to what extent certain approaches to life changed because of their WTC experience. Item scores were summed and analyzed as a continuous variable (PTGI-SF score ≥ 30 was used to suggest growth). The Mount Sinai WTC-HP Research Workgroup also had the PTGI-SF translated into Spanish using certified translation services, because a Spanish version was not available.

Independent Variables

Coping. A condensed and modified version of the Brief COPE (see Appendix B, question 18), asking participants to list their three most commonly used coping skills was used for these analyses. The Brief COPE is a reliable, valid, and widely used self-completed questionnaire comprised of 14 items, measuring the respondents' coping strategies. All of the items in the Brief COPE meet or exceed an alpha value of .50 (Carver, 1997). The correlations between English and Spanish versions of the scale range from .73 for Acceptance to .93 for Religious Coping, with the exception for the Behavioral Disengagement scale, which correlates at .43 between versions (Perczek, 2000). Participant responses to the coping items were recoded into dichotomous (Yes/No) answers and analyzed as a categorical variable.

While the Brief COPE lists religious coping as an item, it does not differentiate between positive and negative religious coping. Hence, the Response to Stressful Experiences Scale (RSES; see Appendix B, question 7), which is a different coping scale, was used to measure positive religious coping. The questions asked in the Web-based survey are more reflective of

positive religious coping, so negative religious coping was not measured. Given the value of religion and spirituality in the Hispanic culture, participant responses to item numbers (4) "Pray or Meditate" and (20) "Lean on my faith in God or a higher power" from the RSES were used to measure positive religious coping in responders. These two items were selected as proxies for how people employ religious coping methods cognitively through thoughts and attitudes and behaviorally through actions (Pargament, K., Feuille, M., & Burdzy, D., 2011). While there are additional aspects of religious coping that are not captured in these two items, they reflect components of having a secure relationship with a transcendent force and a sense of spiritual connectedness, which are associated with positive religious coping (Pargament, K., Feuille, M., & Burdzy, D., 2011). Participant responses to these two items were summed and analyzed as a continuous variable with higher scores suggesting higher rates of positive religious coping.

The RSES does not solely measure aspects of religious coping; it also assesses cognitive, emotional, and behavioral responses that an individual characteristically employs in response to stressful life events. However, for purposes of this study the RSES was only used to measure positive religious coping in WTC responders. The Brief COPE was used to assess all other coping strategies, since it is a more widely used instrument to assess coping and has been validated in both English and Spanish. The RSES is a 23-item scale developed by the National Center for PTSD, which yields a total score and five dimensions of trait-based responses to stress: meaning-making/restoration, active coping, cognitive flexibility, spirituality, and self-efficacy. The RSES demonstrates sound internal consistency ($\alpha = .91 - .93$) and good test-retest reliability ($r = .87$) (Johnson et al., 2011). The RSES currently is not available in Spanish; therefore, the Mount Sinai WTC-HP Mental Health Research Workgroup had the RSES translated into Spanish using certified translation services.

Another important characteristic of Hispanic culture is its social, interdependent construal of self-identity, coping, and well-being. Hence, an abbreviated 5-item version of the Medical Outcomes Study Social Support Survey (MOS-SSS; see Appendix B, question 26) was used to assess the responders' level of perceived social support. Participants were asked to rate how often each type of support is available to them if they need it. Items are rated on a 5-point Likert-type scale ranging from 1 (none of the time) to 5 (all of the time) with higher scores indicating higher perceived availability of social support. There are no known cut-off scores for the MOS-SSS. Nevertheless, internal consistency reliability estimates for the MOS-SSS are high, exceeding .50 for all support measures (Sherbourne & Stewart, 1991). The MOS-SSS also has a Spanish version showing similar psychometric properties as the English version (de la Revilla et al., 2005). In this study, participant responses were summed and analyzed as a continuous variable with higher scores suggesting higher rates of perceived social support.

Covariates

WTC related-trauma exposure was used as a covariate in the data analyses. In these analyses, the WTC-related exposures were drawn from the clinician-administered interviews conducted during the initial WTC-HP monitoring visit. Exposures assessed included 1) early arrival (i.e., beginning work at the WTC work site between September 11 and September 13, 2001); 2) being caught in the dust cloud; 3) working primarily/adjacent to the collapse site, known as the "pit" or the "pile" during September 2001; 4) working more than the median number of hours on the WTC site; 5) exposure to human remains (i.e., any exposure to human remains between September 11, 2001, and June 30, 2002); 6) involvement in search and rescue efforts during September to October 2001; 7) sleeping on site; 8) traumatic death of a colleague, family member, or friend on 9/11; 9) being treated for an injury or illness while working on the

WTC recovery effort; and 10) knowing someone who suffered an injury on 9/11. The total number (range 0–10) of WTC exposures was analyzed as a continuous variable.

Demographic variables including sex and age were also drawn from the WTC-HP initial monitoring visit dataset stored at the WTC Data Center and used as covariates in the data analyses. Level of education, employment status, marital status, and income were drawn from the survey and used as covariates. Language choice when filling out the survey (Spanish vs. English) and birthplace also were used as covariates and proxies of acculturation. All demographic variables used, except for language preference, birthplace, sex, marital status, and employment status, were analyzed as continuous variables. Language preference in completing the survey, birthplace, sex, marital status, and employment status were used and analyzed as categorical variables.

Clinical characteristics including having a prior diagnosis of depression, anxiety, or PTSD, or being diagnosed with asthma, sinusitis, or GERD after 9/11 were variables provided by the WTC Data Center and also used as covariates. All of the clinical characteristics used in the data were analyzed as categorical variables. While the responders' history of mental health treatment was available, it was not used in the data analyses to prevent multicollinearity.

Psychosocial characteristics including sources of family and work support and number of life stressors before and after 9/11 were obtained from the WTC-HP initial monitoring visit dataset and used as covariates. An additional variable used as a covariate was the responders' level of perceived preparedness drawn from the Web-based survey. Sources of family and work support, number of life stressors before and after 9/11, and level of perceived preparedness were analyzed as continuous variables. Additional available psychosocial characteristics (e.g., disaster response experience and insurance) were not used in the data analyses.

Data Analyses

The analytic strategy in this study involved several stages. First, several statistical tests were conducted to assess the accuracy of the data and identify outliers and missing values. Frequency distributions and descriptive statistics (range of values, mean, *SD*) were used to determine the accuracy of the data and to identify missing values. Normality was tested using the Shapiro-Wilk test and by measuring the data's skewness and kurtosis. Outliers were detected using box plots, Q-Q plots, and histograms. Approximately 318 participants who participated in the Web-Based survey but left most or all of the survey questions unanswered were removed from the final dataset. Further, multiple imputation using chained equations was used to impute missing values. The fit of one- to six-class models was evaluated using several fit indices, including Bayesian Information Criterion (BIC), sample size-adjusted BIC, Akaike Information Criterion (AIC), Entropy values, Lo–Mendell–Rubin adjusted likelihood test and bootstrap likelihood ratio tests. Parsimony and theoretical and clinical interpretability of solutions were additionally considered, and final models with approximately 5% of participants in the smallest class were selected. The highest posterior probability was used to assign respondents to a class.

Data Analysis Plan

Cross tabulation and regression analyses were then conducted to compare differences in coping responses between Hispanics, Non-Hispanic Whites, and Non-Hispanic Blacks, as well as among Hispanic responders, while controlling for WTC-related trauma exposure and demographic and clinical characteristics of WTC responders. These data also were used to examine the association between the responders' use of positive religious coping, perceived social support, and active coping to their PTSD symptom levels and psychological well-being (positive affect, life satisfaction, and posttraumatic growth). Further, a moderation effect was

tested to examine if the relationship between active coping and PTSD symptom levels and active coping and psychological well-being varies by language preference and US nativity among Hispanics. Statistical Package for the Social Sciences (SPSS) software was used to analyze the data derived from scales and to achieve the study's four aims:

Aim 1: To identify how coping strategies reported by Hispanic WTC responders compared to those reported by Non-Hispanic White and Non-Hispanic Black responders.

Hypothesis 1: Hispanic WTC responders will report relying on religion and social support as primary modes of coping more often than Non-Hispanic White and Non-Hispanic Black responders.

Aim 2: To determine how coping strategies reported by Hispanic WTC responders varied by language preference and US nativity.

Hypothesis 2: Hispanic WTC rescue and recovery workers who completed the survey in Spanish and were not born in the US will be more likely than workers who completed the survey in English and were born in the US to rely on religion and social support as primary modes of coping, the latter derived by combining the emotional support and instrumental support variables.

Aim 3a: To examine the association between the Hispanic WTC responders' use of positive religious coping and perceived social support to PTSD symptom levels more than 10 years after 9/11.

Aim 3b: To examine the relationship between active coping and PTSD symptom levels in Hispanic responders more than 10 years after 9/11 and to determine whether this relationship was moderated by language choice and US nativity.

Hypothesis 3a): Hispanic WTC rescue and recovery workers with higher levels of positive

religious coping and perceived social support will exhibit lower levels of PTSD symptoms.

Hypothesis 3b): Language preference and place of birth will moderate the association between active coping and PTSD symptom levels in Hispanic WTC responders. This relationship will be stronger in Hispanic WTC responders who completed the survey in English and were born in the US than in Hispanic responders who completed the survey in Spanish and were not born in the US.

Aim 4a: To examine the relationship between the Hispanic WTC responders' use of positive religious coping and perceived social support to psychological well-being before and after adjusting for PTSD symptom levels.

Aim 4b: To examine the association between active coping and psychological well-being in Hispanic responders before and after adjusting for PTSD levels and to determine whether this relationship is moderated by language choice and US nativity.

Hypothesis 4a): Hispanic WTC rescue and recovery workers with higher levels of positive religious coping and perceived social support will exhibit higher levels of positive affect, life satisfaction, and posttraumatic growth, before and after adjusting for PTSD symptom levels.

Hypothesis 4b): Language choice and US nativity will moderate the relationship between active coping and levels of positive affect, life satisfaction, and posttraumatic growth, before and after adjusting for PTSD symptom levels. This relationship will be stronger in Hispanic responders who completed the survey in English and were born in the US than in Hispanic responders who completed the survey in Spanish and were not born in the US.

The data analyses included various steps. First, the three most commonly used coping strategies reported by WTC responders were examined by race/ethnicity, as measured by the Brief COPE (Carver, 1997). Cross tabulation analysis and logistic regression were used to

examine differences in coping responses between Hispanic, Non-Hispanic White, and Non-Hispanic Black responders before and after controlling for WTC-related trauma exposure and demographic, clinical, and psychosocial characteristics. Further, differences in positive religious coping and perceived social support were also compared.

Differences between Hispanic responders who completed the survey in English and those who completed the survey in Spanish were then examined in addition to differences between those who were US born and foreign born. Further, coping strategies reported by Hispanic responders who completed the survey in Spanish were examined by ethnic sub-group. Cross tabulation analysis and logistic regression were used to examine differences in coping among Hispanics, as measured by the Brief COPE (see page 42 for description; Appendix B for instrument; Carver, 1997). Collinearity diagnostics also were conducted to check for collinearity between US nativity and language preference. In these analyses, the Forward Wald method was used in a separate step for US nativity and language due to possible collinearity. Additionally, multiple linear regressions, using the stepwise method in a separate step for US nativity and language preference, also were used to examine differences in positive religious coping and perceived social support among Hispanic WTC responders by US nativity and language preference. Positive religious coping was measured using participant responses to item numbers (4) "Pray or Meditate" and (20) "Lean on my faith in God or a higher power" from the Response to Stressful Experiences Scale (RSES; see page 42 for description; Appendix B for instrument; Johnson et al., 2011) and perceived social support was assessed using the participants' responses to the emotional/informational subscale of the Medical Outcomes Study Social Support Survey (MOS-SSS; see page 44 for description; Appendix B for instrument; Sherbourne & Stewart, 1991).

I then examined the relationship between the use of positive religious coping, perceived social support, and active coping to PTSD symptom levels among WTC responders and among Hispanic responders by language preference and US nativity. To test for associations between positive religious coping, perceived social support, and active coping to PTSD levels, a multiple linear regression was performed with PTSD symptom levels as the dependent variable; positive religious coping, perceived social support, and active coping were used as independent variables; trauma exposure, demographic variables, clinical, and psychosocial characteristics were used as covariates. For these analyses, PTSD symptom levels were assessed using participant responses to the Posttraumatic Stress Disorder Checklist-Specific Version (PCL-S; see page 39 for description; Appendix B for instrument; Weathers et al., 1993). The responses of Hispanic participants who completed the survey in Spanish were compared to those who completed the survey in English. Similarly, the responses of Hispanic participants born in the US were compared to those not born in the US.

I used Moderation analysis to test the moderation effect of language preference and US nativity on the relationship between active coping and PTSD symptom levels in Hispanic WTC responders. In these analyses, active coping was the independent variable. Active coping was measured using item number (2) "Active Coping (e.g., take action to make the situation better)" from the Brief COPE (Carver, 1997). Birthplace and language preference in completing the survey were used as moderator variables and PTSD symptom level was used as the dependent variable. Trauma exposure, positive religious coping, perceived social support, demographic, clinical, and psychosocial characteristics were included as covariates. A moderation model was used with latent factors created for the interaction between active coping and US nativity, and active coping and language preference. Having them significantly contribute to the model would

mean there is an interaction.

Figure 4: Moderation Model
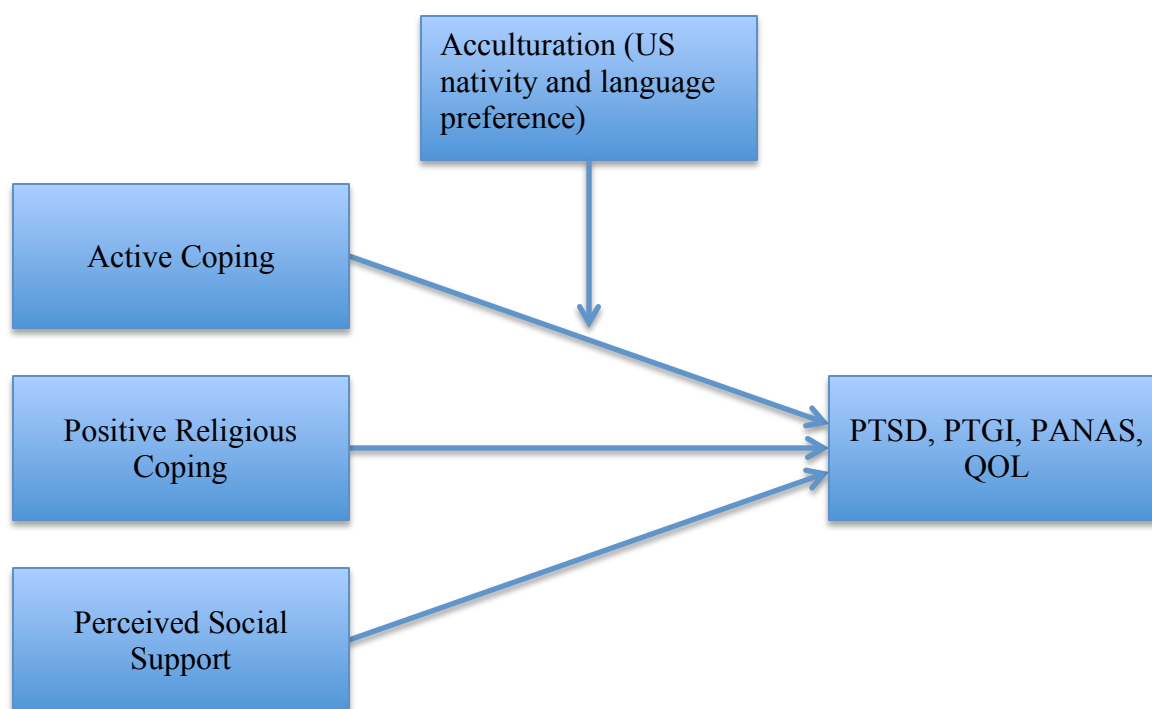
Figure 4. An illustration of Haye's Model 1 conceptual diagram examining the moderation effect of acculturation on the relationship between active coping and PTSD symptom levels and between active coping and psychological well-being in Hispanic WTC rescue and recovery workers. Adapted from Hayes, A. F. (2013*). Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York: Guilford Press.

Finally, the relationship between the use of positive religious coping, perceived social support, and active coping to experiences of positive emotion, life satisfaction, and posttraumatic growth among WTC responders were examined before and after controlling for PTSD symptom levels. These associations also were examined among Hispanic responders by language preference and US nativity. Multiple linear regressions were conducted to test for associations between positive religious coping, perceived social support, and active coping to experiences of

positive emotion, life satisfaction, and posttraumatic growth, while controlling for PTSD

symptom levels, trauma exposure, demographic, clinical and psychosocial characteristics. For

these analyses, experience of positive emotion, life satisfaction, and posttraumatic growth were

the dependent variables, respectively. Positive religious coping, perceived social support, and

active coping were used as the independent variables; PTSD symptom levels, trauma exposure,

demographic variables, clinical, and psychosocial characteristics were used as covariates.

Positive emotion was measured using participant responses to the trait version of the Positive and

Negative Affect Schedule (PANAS; see page 40 for description; Appendix B for instrument;

Watson et. al., 1988), life satisfaction was assessed using responses to the Quality of Life

Enjoyment and Satisfaction Scale-Short Form (Q-LES-Q-SF; see page 41 for description;

Appendix B for instrument; Endicott et al., 1993), and posttraumatic growth was assessed using

the responses to the Posttraumatic Growth Inventory-Short Form (PTGI-SF; see page 41 for

description; Appendix B for instrument; Cann et al., 2010).

Here I also tested the moderation effect of language preference and US nativity among

Hispanic responders on the association between active coping and positive emotion, between

active coping and life satisfaction, and between active coping and posttraumatic growth while

controlling for PTSD symptom levels. In these analyses, active coping was the independent

variable, language preference and birthplace the moderator variables, and positive emotion, life

satisfaction, and posttraumatic growth the dependent variables. PTSD symptom levels, trauma

exposure, positive religious coping, perceived social support, demographic, clinical and

psychosocial characteristics were included as covariates. A moderation model was used with

latent factors created for the interaction between active coping and US nativity, as well as active

coping and language preference. Having them significantly contribute to the model would mean

there was an interaction.

Summary

In this chapter, I described the study sample and provided an overview of the Trajectories Study where data for the secondary analyses originated. I also provided a description of the WTC Health Program, the associated Clinical Centers of Excellence, and the WTC Data Center, which stores clinical data on the first responders' yearly monitoring visits. A summary of the study variables and instrumentation used was outlined, and the study aims and hypotheses were reviewed. Further, a detailed account of the data analyses used and steps taken to achieve the dissertation's study aims were listed. The following chapter will present the demographic characteristics of the study's sample and the subsequent three chapters report on the study's findings.

CHAPTER 4: DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

This chapter presents the demographics, WTC-related exposures, psychosocial and clinical characteristics of the study sample. Given the diversity of the WTC first responder population and this dissertation's focus on Hispanics, the chapter begins with a description of the WTC Health Program membership and then presents the study sample demographics in five different tables. The demographics, WTC-related exposures, psychosocial and clinical characteristics of the 10,835 responders who participated in the trajectories study are presented in Tables 1a-c. Similar demographics are presented in Tables 2a-c for the 4,148 responders who completed the web-based survey. Then, demographics of the 806 Hispanic responders who participated in the web-based survey are presented in Tables 3a-c. Last, differences between Hispanic responders who completed the survey in Spanish and those who completed the survey in English are presented in Tables 4a-c, as well as differences between Hispanic responders who are US-born and those born abroad (Tables 5a-c) are examined.

WTC Health Program Membership

To date, there are a total of 75,739 WTC Health Program members. Responders (not including the FDNY) represent the majority of members at 40,303 and are followed by FDNY responders at 16,510. Other program members include 9,097 survivors who lived, worked, and attended school or day care in the surrounding area, and 8,929 nationwide members. Of the 75,739 program members a total of 14,759 have joined since July 1, 2011 (Centers for Disease Control and Prevention: WTC Health Program website, 2016).

Trajectories Study Sample

Tables 1a-c present the demographics, exposures, psychosocial and clinical characteristics of the police responders and non-traditional responders who participated in the

trajectories study conducted by the research team at the WTC Mental Health Program at the Icahn School of Medicine at Mount Sinai. Of the 40,303 WTC-HP responder members, 10,835 responders who completed visits 1, 2, and 3 [conducted an average of 3.3 years (SD=1.9, range 0.8-8.0), 5.7 years (SD=1.7, range 3.1-9.0) and 7.9 years (SD=1.3, range 5.3-10.1) after 9/11] of the WTC-HP participated in the trajectories study. Of the 10,835 responders who participated in the trajectories study, most self-identify as Non-Hispanic White among police (n=2732, 67.74%) and non-traditional responders (n=4145, 60.97%), followed by Hispanics at 1663 (24.46%) among non-traditional responders and 817 (20.26%) police responders. Most are higher educated, married/partnered, and had not been diagnosed with depression, anxiety, or PTSD prior to 9/11; however, compared to non-traditional responders, police responders report more WTC-related exposures, more sources of family and work support while working at the WTC site, fewer stressors in the years before and after 9/11, and were more likely to have been diagnosed with asthma and sinusitis within three months of their first visit to the WTC-HP.

Table 1a.

Demographic Characteristics of Non-Traditional and Police WTC Responders (N=10,835)

Demographics	Non-Traditional Responders (*N*=6800)		Police Responders (*N*=4035)	
	n or Mean	% or SD	*n* or Mean	% or SD
Age at Visit 1	45.3	9.60	41.2	6.6
Sex				
Female	913	13.43	592	14.67
Male	5886	86.57	3443	85.33
Race/ethnicity				
White, non-Hispanic	4145	60.97	2732	67.74
Hispanic	1663	24.46	817	20.26
Black, non-Hispanic	808	11.89	396	9.82
Other	182	2.68	88	2.18
Education				
High school or less	2599	42.03	615	16.01
More than high school	3584	57.97	3226	83.99
Marital status				
Married or partnered	4373	67.12	2902	73.71
Never married	1084	16.64	563	14.30
Widowed, separated or divorced	1058	16.24	472	11.99
Income ≤US$70,000	3385	63.14	1333	38.34

Table 1b.

World Trade Center-Related Exposures in Non-Traditional and Police WTC Responders (N=10,835)

Exposure Type	Non-Traditional Responders (*N*=6800)		Police Responders (*N*=4035)	
	n or Mean	% or SD	*n* or Mean	% or SD
Total number of exposures	3.47	1.91	5.19	1.95
Arrived 11-13 September 2001				
Yes	4427	65.10	3552	88.03
Caught in dust cloud				
Yes	941	13.84	1239	30.71
Exposed to human remains				
Yes	2506	36.85	2666	66.07
Know somebody who was injured on 9/11				
Yes	1774	30.61	2058	56.90
Search, rescue, and recovery September – October 2001				
Yes	681	10.01	1239	30.71
Slept on-site during September – October 2001				
Yes	859	17.04	724	20.34
Somatic injury/illness while at worksite				
Yes	1850	28.00	1074	27.19
Traumatic death of colleague, family member or friend				
Yes	2193	37.82	2578	71.14
Worked adjacent to pit/pile				
Yes	5435	79.93	3320	82.28
Worked more than the median hours (135 hours)				
Yes	2903	42.69	2510	62.21

Table 1c.

Psychosocial and Clinical Characteristics in Non-Traditional and Police WTC Responders (N=10,835)

Psychosocial and Clinical Characteristics	Non-Traditional Responders (*N*=6800)		Police Responders (*N*=4035)	
	n or Mean	% or SD	*n* or Mean	% or SD
Pre-9/11 History				
Diagnosed depression prior to 9/11	595	8.91	149	3.74
Diagnosed anxiety disorder prior 9/11	488	7.31	156	3.92
Diagnosed PTSD prior to 9/11	414	6.21	121	3.05
Number of life stressors before 9/11	1.3	1.70	1	1.30
Social support while working at WTC site				
Number of important sources of family support while working at the WTC site	2	1.70	2.7	1.70
Number of sources of work support while working at the WTC site	0.6	0.80	0.8	0.80
Post-9/11 Variables				
Diagnosed with asthma within 3 months of visit 1				
Yes	1314	19.32	944	23.40
Diagnosed with GERD within 3 months of visit 1				
Yes	1658	24.38	1008	24.98
Diagnosed with sinusitis within 3 months of visit 1				
Yes	1939	28.51	1296	32.12
Number of life stressors since 9/11	2.6	2.4	2	1.9

(Pietrzak, et. al, 2014)

Web-Based Survey Study Sample

Of the 10,835 trajectories study participants, 6,642 (61.3%) provided written consent to be contacted for future studies. Of these 6,642 WTC responders, 4,487 (67.6%) participated in a web-based survey examining the psychosocial characteristics associated with low-symptom and recovering trajectories of PTSD in WTC responders, and 4,148 (62.5%) completed the web-based survey. Comparison of the 4,148 web-based survey participants with the 6,687 WTC responders from the original cohort of 10,835 who did not participate in the web-based survey revealed no differences in sex (85.9% and 86.2% male, respectively, $X^2(1)=0.17$, p=068). Compared to non-participants, survey participants were slightly older (44.3 ± 8.8 vs. 43.4 ± 8.8, t (10,833)=5.30, p<.001) and more likely to be Caucasian ($X^2(1)=64.3\%$ vs. 59.7%, 23.46, p<.001) and police responders (41.8% vs. 34.0%, $X^2(1)=67.08$, p<.001). Survey participants also reported a greater number of WTC exposures [4.3 ± 2.1 vs. 4.0 ± 2.1, t (10,833)=6.85, p<.001].

Tables 2a-c show a more detailed account of the demographics, exposures, psychosocial and clinical characteristics of the responders who participated in the web-based survey. Of the 4,148 responders who completed the web-based survey, approximately 806 (19.4%) self-identified as Hispanic, following 2,722 (65.6%) who self-identified as Non-Hispanic White. The sample is predominantly male, and most reported that they were either married or partnered. Most participants completed the survey in English and reported having more than a high school education. Approximately 1,417 (34.2%) reported having an income between $80,001 and 120,000, and a little over half reported that they are currently working. Further, most (n=493; 12%) had not been diagnosed with depression, anxiety, or PTSD prior to 9/11; experienced an average of 4 WTC related exposures; reported an increase in life stressors since 9/11; reported having an average of 2.4 sources of family support and an average of 0.7 sources of work

support while working at the WTC site. Moreover, more than half were diagnosed with GERD

after 9/11. Last, web-based survey participants reported experiencing an average score of 1.8 out

of 3 on perceived preparedness and an average score of 32.6 on the PCL.

Table 2a.

Demographic Characteristics of Web-Based Survey Responders (N=4,148)

Demographics	Web-Based Survey Responders (*N*=4148)	
	n or Mean	% or SD
Age at Visit 1	44.4	8.8
Sex		
Female	571	13.8
Male	3577	86.2
Race/ethnicity		
White, non-Hispanic	2722	65.6
Hispanic	806	19.4
Black, non-Hispanic	416	10
Other	204	5
Education		
High school or less	1069	25.8
More than high school	3069	74.2
Marital status		
Married or partnered	3268	78.9
Never married	383	9.2
Widowed, separated or divorced	490	11.8
Income		
≤US$40,000	679	16.4
40,001-80,000	1259	30.4
80,001-120,000	1417	34.2
120,001 or Above	771	18.6
Didn't wish to answer	22	0.5
Working		
Yes	2298	55.4
Language preference		
English	3957	95.4
Spanish	191	4.6

Table 2b.

World Trade Center-Related Exposures in Web-Based Survey
Responders (N=4,148)

Exposure Type	Web-Based Survey Responders (*N*=4148)	
	n or Mean	% or SD
Total number of exposures	4.3	2.1
Arrived 11-13 September 2001		
Yes	3212	77.4
Caught in dust cloud		
Yes	927	22.3
Exposed to human remains		
Yes	2068	49.9
Know somebody who was injured on 9/11		
Yes	1593	44
Search, rescue, and recovery September – October 2001		
Yes	782	18.9
Slept on-site during September – October 2001		
Yes	583	17.9
Somatic injury/illness while at worksite		
Yes	1142	28.1
Traumatic death of colleague, family member or friend		
Yes	1989	54.8
Worked adjacent to pit/pile		
Yes	3360	81
Worked more than the median hours (135 hours)		
Yes	2100	50.6

Table 2c.

Psychosocial and Clinical Characteristics of Web-Based Survey Responders (N=4,148)

Psychosocial and Clinical Characteristics	Web-Based Survey Responders (*N*=4148)	
	n or Mean	% or SD
Pre-9/11 History		
Any diagnosis of depression, anxiety, PTSD prior to 9/11		
Yes	493	12
Number of life stressors before 9/11	1.2	1.5
Potentially Protective Factors		
Perceived preparedness	1.8	1.4
Social support while working at WTC site		
Number of important sources of family support while working at the WTC site	2.4	1.7
Number of sources of work support while working at the WTC site	0.7	0.8
Post-9/11 Variables		
PCL Score	32.6	15.8
Diagnosed with asthma after 9/11		
Yes	1960	47.6
Diagnosed with GERD after 9/11		
Yes	2281	55.4
Diagnosed with sinusitis after 9/11		
Yes	2286	55.5
Number of life stressors since 9/11	2.3	2.1

Hispanic WTC Responders

Tables 3a-c provide a closer look at the demographics, WTC-related exposures, psychosocial and clinical characteristics of the 806 web-based survey responders who self-identified as Hispanic. This sample is younger (41.8, SD=7.9 vs 44.4, SD=8.8) than the larger sample. Most (n=615, 76.3%) completed the survey in English and more than half (n=479, 59.5%) were born in the United States. Further, among those who were born abroad, a little more than half completed the survey in English: 169 (51.8%). Similarly to the larger sample, we find that most are male (n=627, 77.8%) and most report being married or partnered (n=588, 73%). More than half — 524 (65.3%) — report having more than a high school education, approximately 407 (50.6%) report working, and 264 (32.8%) report having an income between $40,001 and 80,000. Further, most had not been diagnosed with depression, anxiety, or PTSD prior to 9/11; experienced an average of 4 WTC-related exposures; reported an increase in life stressors since 9/11; reported having an average of 2.3 sources of family support and an average of 0.7 sources of work support while working at the WTC site. Moreover, Hispanic responders report an average score of 1.4 on perceived preparedness. Last, more than half (n= 490, 61.8%) report being diagnosed with GERD after 9/11, as well as reporting an average score of 36.6 on the PCL.

Table 3a.

Demographic Characteristics of Hispanic WTC Responders (N=806)

Demographics	Hispanic WTC Responders (*N*=806)	
	n or Mean	% or SD
Age at Visit 1	41.8	7.9
Sex		
Female	179	22.2
Male	627	77.8
Language preference		
English	615	76.3
Spanish	191	23.7
US Nativity		
Born in US	479	59.5
Born Abroad	326	40.5
Language preference among those born abroad		
English	169	51.8
Spanish	157	48.2
Education		
High school or less	279	34.7
More than high school	524	65.3
Marital status		
Married or partnered	588	73
Never married	70	8.7
Widowed, separated or divorced	148	18.4
Income		
≤US$40,000	233	28.9
40,001-80,000	264	32.8
80,001-120,000	213	26.4
120,001 or Above	93	11.5
Didn't wish to answer	3	0.4
Working		
Yes	407	50.6

Table 3b.

World Trade Center-Related Exposures in Hispanic Responders (N=806)

Exposure Type	Hispanic WTC Responders *(N=806)*	
	n or Mean	% or SD
Total number of exposures	3.9	2.1
Arrived 11-13 September 2001		
Yes	544	67.5
Caught in dust cloud		
Yes	181	22.5
Exposed to human remains		
Yes	333	41.3
Know somebody who was injured on 9/11		
Yes	269	40.1
Search, rescue, and recovery September – October 2001		
Yes	108	13.4
Slept on-site during September – October 2001		
Yes	104	15.1
Somatic injury/illness while at worksite		
Yes	217	27.4
Traumatic death of colleague, family member or friend		
Yes	313	45.8
Worked adjacent to pit/pile		
Yes	666	82.6
Worked more than the median hours (135 hours)		
Yes	423	52.5

Table 3c.

Psychosocial and Clinical Characteristics of Hispanic Responders (N=806)

Psychosocial and Clinical Characteristics	Hispanic WTC responders (*N*=806)	
	n or Mean	% or SD
Pre-9/11 History		
Any diagnosis of depression, anxiety, PTSD prior to 9/11		
Yes	88	11
Number of life stressors before 9/11	1.3	1.6
Potentially Protective Factors		
Perceived preparedness	1.4	1.4
Social support while working at WTC site		
Number of important sources of family support while working at the WTC site	2.3	1.7
Number of sources of work support while working at the WTC site	0.7	0.8
Post-9/11 Variables		
PCL Score	36.6	17.7
Diagnosed with asthma after 9/11		
Yes	377	47.5
Diagnosed with GERD after 9/11		
Yes	490	61.8
Diagnosed with sinusitis after 9/11		
Yes	458	57.8
Number of life stressors since 9/11	2.6	2.3

Tables 4a-c compare the demographic, psychosocial and clinical characteristics of 191 Hispanic responders who completed the survey in Spanish and 615 Hispanic responders who completed the survey in English. Among responders who completed the survey in Spanish, most identified as being from South America, specifically from Ecuador (n=83, 43.5%); most who completed the survey in English identified as being from Puerto Rico (n=366, 59.5%). Both samples are predominantly male and report being married or partnered; however, among those who completed the survey in Spanish, more than twice as many identified as female (38.7% vs. 17.1%; $x^2(1)=39.6$, $p < .001$) and reported being widowed, separated, or divorced (30.4% vs. 14.6%; $x^2(2)=26.1$, $p < .001$). Similarly, most Hispanic responders who completed the survey in English report having more than a high school education, and 64.4% of those who completed the survey in Spanish report completing high school or less. Further, most Hispanic responders who completed the survey in Spanish report not working and having an income of $40,000 or less; among those who completed the survey in English, 56.4% report working and 35.9% report having an income between $40,001 and 80,000. Further, most had not been diagnosed with depression, anxiety, or PTSD prior to 9/11. However, in comparison to those who completed the survey in English, Hispanic responders who completed the survey in Spanish report experiencing a lower number of WTC-related exposures (Mean=2, SD=1.4 vs Mean=4.5, SD=2; $t(456)=18.1$, $p < .001$); less sources of family support (Mean=1.5, SD=1.5 vs Mean=2.5, SD=1.7; $t(362)=7.58$, $p < .001$) and work support (Mean=0.4, SD=0.7 vs Mean=0.7, SD=0.8; $t(348)=5.7$, $p < .001$), while working at the WTC site; a lower level of perceived preparedness (Mean=1.1, SD=1.4 vs Mean=1.5, SD=1.4; $t(312)=3.61$, $p < .001$); report having a higher number of life stressors since 9/11 (Mean=3, SD=2.4 vs Mean=2.5, SD=2.3; $t(362)=7.58$, $p < .01$); scored higher on the PCL (Mean=49.2, SD=17.1 vs Mean=32.7, SD=16.1; $t(302)= -11.77$, $p < .001$); were more likely to

have been diagnosed with GERD (n=149, 80.1% vs n=341, 56.2%; $x^2(1) = 34.5, p < .001$) and

sinusitis (n=137, 73.7% vs n=321, 52.9%; $x^2(1)=25.2, p < .001$) after 9/11.

Table 4a.

Demographic Characteristics of Hispanic Responders by Language Preference (N=806)

Demographics	Spanish (N=191)		English (N=615)		x^2 or t
	n or Mean	% or SD	n or Mean	% or SD	
Age at Visit 1	41.8	9.3	41.7	7.4	-0.9
Sex***					40
Female	74	38.7	105	17.1	
Male	117	61.3	510	82.9	
Country of Origin					
Ecuador	83	43.5	25	0.04	
Colombia	51	26.7	19	0.03	
Dominican Republic	16	0.08	63	10.2	
Mexico	6	0.03	10	0.02	
Puerto Rico	2	0.01	366	59.5	
Other	33	17.2	132	21.5	
Education***					95
High School or less	121	64.4	158	25.7	
More than high school	67	35.6	457	74.3	
Marital status***					26.1
Married or partnered	114	59.7	474	77.1	
Never married	19	9.9	51	8.3	
Widowed, separated or divorced	58	30.4	90	14.6	
Income***					264.3
≤US$40,000	139	72.8	94	15.3	
40,001-80,000	43	22.5	221	35.9	
80,001-120,000	5	2.6	208	33.8	
120,001 or Above	1	0.5	92	15	
Didn't wish to answer	3	1.6	0	0	
Working***					36
Yes	60	31.6	347	56.4	

p< .05*, .01**, .001***

Table 4b.

World Trade Center-Related Exposures in Hispanic Responders by Language (N=806)

Exposure Type	Spanish (*N*=191)		English (*N*=615)		x^2 or t
	n or Mean	% or SD	*n* or Mean	% or SD	
Total number of exposures***	2.2	1.4	4.5	2	18.1
Arrived 11-13 September 2001***					166.3
Yes	56	29.3	488	79.3	
Caught in dust cloud***					60
Yes	4	2.1	177	28.8	
Exposed to human remains***					82.3
Yes	25	13.1	308	50.1	
Know somebody who was injured on 9/11***					53
Yes	16	12.2	253	46.9	
Search, rescue, and recovery September - October 2001***					36
Yes	1	0.5	107	17.4	
Slept on-site during September - October 2001***					14
Yes	11	6.4	93	18	
Somatic injury/illness while at worksite					0
Yes	50	27.3	167	27.5	
Traumatic death of colleague, family member or friend***					86
Yes	15	10.8	298	54.7	
Worked adjacent to pit/pile					1.1
Yes	153	80.1	513	83.4	
Worked more than the median hours (135 hours)***					10.2
Yes	81	42.4	342	55.6	

p< .05*, .01**, .001***

Table 4c.

Psychosocial and Clinical Characteristics of Hispanic Responders by Language (N=806)

Psychosocial and Clinical Characteristics	Spanish (N=191)		English (N=615)		x^2 or t
	n or Mean	% or SD	*n* or Mean	% or SD	
Pre-9/11 History					
Any diagnosis of depression, anxiety, PTSD prior to 9/11					0.07
Yes	22	11.5	66	10.9	
Number of life stressors before 9/11	1.3	1.7	1.3	1.6	-0.42
Potentially Protective Factors					
Perceived preparedness***	1.1	1.4	1.5	1.4	3.6
Social support while working at the WTC site					
Number of important sources of family support while working at the WTC site	1.5	1.5	2.5	1.7	7.6
Number of sources of work support while working at the WTC site	0.4	0.7	0.7	0.8	5.7
Post-9/11 Variables					
PCL Score***	49.2	17.1	32.7	16.1	-11.7
Diagnosed with asthma after 9/11					3.1
Yes	99	53.2	278	45.8	
Diagnosed with GERD after 9/11***					34.5
Yes	149	80.1	341	56.2	
Diagnosed with sinusitis after 9/11***					25.2
Yes	137	73.7	321	52.9	
Number of life stressors since 9/11**	3	2.4	2.5	2.3	-2.6

p< .05*, .01**, .001***

Tables 5a-c present demographics, psychosocial and clinical characteristics of both Hispanic responders who were born in the United States and those who were born abroad. Hispanic responders who were born abroad are slightly older than those who were born in the United States (Mean=42.6, SD=8.8 vs Mean=41.2, SD=7.2; $t(602.7)= -2.3$, $p < .05$). Most are male, and although not significant, among responders who were born abroad there is a slightly larger percentage who identify as female (25.2% vs 20.3%) in comparison to those born in the United States. Most who were born in the United States identify being of Puerto Rican origin and most who were born abroad identify as being from Ecuador. Among Hispanic responders who were born in the United States, 71.2% report completing more than high school, whereas among those who were born abroad, 56.7% report completing more than high school. Similarly, a larger percentage of Hispanic responders who were born in the United States report working and having an income between $40,001 and 80,000 in comparison to responders who were born abroad who mostly report having an income of <$40,000. Further, Hispanic responders who were born in the United States report having more sources of family support (Mean=2.4, SD=1.7 vs 2.1, SD=1.7; $t(698.1)=3$, $p < .01$) and work support (Mean=0.7, SD=0.8 vs Mean=0.6, SD=0.8; $t(708.2)=3$, $p < .01$) while working at the WTC site and a higher number of WTC-related exposures (Mean=4.4, SD=2 vs Mean=3.3, SD=2.1; $t(685.9)=7.4$, $p < .001$) than those born abroad. Conversely, responders who were born abroad reported a higher mean score on the PCL (Mean=41.5, SD=18.6 vs Mean=33.3, SD=16.4; $t(639.7)= -6.5$, $p < .001$) and were more likely to have been diagnosed with GERD (n=225, 70% vs n=264, 56.1%; $x^2(1)=16$, $p < .001$) after 9/11. Last, proportions of responders who were diagnosed with depression, anxiety, or PTSD prior to 9/11, levels of perceived preparedness, and the number of life stressors since 9/11 did not differ.

Table 5a.

Demographic Characteristics of Hispanic Responders by US Nativity (N=805)

Demographics	US Born (N=479)		Born Abroad (N=326)		x^2 or t
	n or Mean	% or SD	*n* or Mean	% or SD	
Age at Visit 1	41.2	7.2	42.6	8.8	-2.4
Sex***					3
Female	97	20.3	82	25.2	
Male	382	79.7	244	74.8	
Country of Origin					
Ecuador	19	0.04	87	26.7	
Colombia	11	0.02	58	17.8	
Dominican Republic	23	0.05	56	17.2	
Mexico	8	0.02	7	0.02	
Puerto Rico	300	62.6	46	14.1	
Other	118	24.6	72	22.1	
Education***					18
High School or less	137	28.8	141	43.3	
More than high school	339	71.2	185	56.7	
Marital status***					18
Married or partnered	376	78.5	212	65	
Never married	33	6.9	36	11	
Widowed, separated or divorced	70	14.6	78	23.9	
Income***					100
≤US$40,000	76	15.9	156	47.9	
40,001-80,000	178	37.2	86	26.4	
80,001-120,000	157	32.8	56	17.2	
120,001 or Above	65	13.6	28	8.6	
Didn't wish to answer	3	0.6	0	0	
Working***					5.2
Yes	258	53.9	149	45.7	

p< .05*, .01**, .001***

Table 5b.

World Trade Center-Related Exposures in Hispanic Responders by US Nativity (N=805)

Exposure Type	US Born (*N*=479)		Born Abroad (*N*=326)		x^2 or *t*
	n or Mean	% or SD	*n* or Mean	% or SD	
Total number of exposures***	4.4	2	3.3	2.1	7.4
Arrived 11-13 September 2001***					50
Yes	369	77	174	53.4	
Caught in dust cloud***					21
Yes	134	28	47	14.4	
Exposed to human remains***					27.3
Yes	234	48.9	99	30.4	
Know somebody who was injured on 9/11***					12.2
Yes	190	45.1	78	31.5	
Search, rescue, and recovery September - October 2001***					5.1
Yes	75	15.7	33	10.1	
Slept on-site during September - October 2001***					6.1
Yes	72	18	32	11.1	
Somatic injury/illness while at worksite					0.54
Yes	135	28.4	82	26	
Traumatic death of colleague, family member or friend***					22.1
Yes	224	52.8	89	34.4	
Worked adjacent to pit/pile					0.3
Yes	393	82	272	83.4	
Worked more than the median hours (135 hours)***					2
Yes	261	54.5	162	49.7	

p< .05*, .01**, .001***

Table 5c.

Psychosocial and Clinical Characteristics of Hispanic Responders by US Nativity (N=805)

Psychosocial and Clinical Characteristics	US Born (N=479)		Born Abroad (N=326)		x^2 or t
	n or Mean	% or SD	*n* or Mean	% or SD	
Pre-9/11 History					
Any diagnosis of depression, anxiety, PTSD prior to 9/11					1
Yes	48	10.1	40	12.3	
Number of life stressors before 9/11	1.3	1.7	1.3	1.6	0.2
Potentially Protective Factors					
Perceived preparedness***	1.5	1.4	1.4	1.5	0.6
Social support while working at the WTC site					
Number of important sources of family support while working at the WTC site	2.4	1.7	2.1	1.7	3
Number of sources of work support while working at the WTC site	0.7	0.8	0.6	0.8	3
Post-9/11 Variables					
PCL Score***	33.3	16.4	41.5	18.6	6.6
Diagnosed with asthma after 9/11					4
Yes	211	44.8	166	51.7	
Diagnosed with GERD after 9/11***					16
Yes	264	56.1	225	70.1	
Diagnosed with sinusitis after 9/11***					4
Yes	259	55	198	61.7	
Number of life stressors since 9/11**	2.6	2.4	2.6	2.1	0.2

p< .05*, .01**, .001***

The demographics presented in this chapter provide a synopsis of the WTC-HP membership and study sample. An overview of the demographics, exposures, psychosocial and clinical characteristics of the responders who participated in the trajectories study and web-based survey are also provided. In this chapter, we learn that survey participants are predominantly male, Non-Hispanic White, police responders, completed the survey in English, are higher educated, and had not been diagnosed with depression, anxiety, or PTSD prior to 9/11. They report a greater number of WTC-related exposures, report having an average of 2.4 sources of family support and an average of 0.7 sources of work support while working at the WTC site. Last, over half were diagnosed with GERD and sinusitis after 9/11.

Among Hispanic responders who participated in the web-based survey, a little more than half were born in the United States, identified being of Puerto Rican origin, and reported having an income between $40,001 and 80,000. Further, among those born abroad, a little more than half completed the survey in English and most identified as being from Ecuador. In comparison to Hispanic responders who were born in the United States, a smaller proportion of Hispanic responders who were born abroad report completing more than high school, fewer report working, and they have a lower income (≤$40,000). Moreover, Hispanic responders who were born abroad experienced fewer WTC-related exposures and reported fewer sources of family and work support while working at the WTC site. The proportions of responders who were diagnosed with depression, anxiety, or PTSD prior to 9/11 and the number of life stressors since 9/11 did not differ. Conversely, responders who were born abroad were more likely to have been diagnosed with GERD after 9/11 and report a higher mean score on the PCL. Additionally, in comparison to Hispanic responders who completed the survey in English, Hispanic responders who completed the survey in Spanish report having a lower level of education, are less likely to

be working, and have a lower income. Further, while Hispanic responders who completed the survey in Spanish report fewer WTC-related exposures, they also report having fewer sources of family and work support while working at the WTC site, have a higher number of life stressors since 9/11, and report higher rates of being diagnosed with GERD and sinusitis after 9/11.

The next chapter will present results on the three most commonly reported coping strategies among first responders by race/ethnicity, before and after controlling for WTC-related trauma exposure, demographics, and clinical and psychosocial characteristics. Coping will also be examined among Hispanic responders by language preference, United States nativity, and country of origin. Further, rates of perceived social support and positive religious coping are examined among WTC responders, as well as among Hispanic responders by language preference and US nativity.

CHAPTER 5: DIFFERENCES IN COPING AMONG WTC RESPONDERS

The results presented in this chapter provide an overview of the coping strategies most commonly reported by the WTC responders who participated in the web-based survey. First, there is an examination of the three coping strategies most commonly used among WTC responders by race/ethnicity, before and after controlling for WTC-related trauma exposure, demographics, and clinical and psychosocial characteristics. The same analyses were conducted with Hispanic responders to compare differences in coping by language preference, US nativity, and country of origin. Last, rates of perceived social support and positive religious coping are examined among WTC responders by race/ethnicity, as well as among Hispanics by language preference and US nativity.

Coping among WTC Responders by Race/Ethnicity

Table 6a offers results of crosstab correlations examining the three coping strategies most commonly used among WTC responders. Here we find that all of the responders report often using acceptance and self-distraction to help them cope since 9/11. Further, Non-Hispanic Black responders are similar to Hispanic responders in that they both report commonly using religion as a mode of coping. Likewise, we find that responders who identified as Other are similar to Non-Hispanic White responders who report commonly using active coping since 9/11.

Table 6a.

Three Most Commonly Used Coping Strategies by Race/Ethnicity (N=4,148)

Coping Strategies	Non-Hispanic White (*N*=2722)	Hispanic (*N*=806)	Non-Hispanic Black (*N*=416)	Other (*N*=204)
Self-Distraction	2	2	3	2
Active Coping	3			3
Denial				
Substance Use				
Emotional Support				
Instrumental Support				
Behavioral Disengagement				
Venting				
Positive Reframing				
Planning				
Humor				
Acceptance	1	1	1	1
Religion		3	2	
Self-Blame				
Other				

When comparing coping strategies among WTC responders by race/ethnicity, we find in Table 6b that there are significant differences in the use of self-distraction ($x^2 = 15.6, p < .001$), substance use ($x^2 = 12.4, p < .01$), behavioral disengagement ($x^2 = 11.7, p < .01$), venting ($x^2 = 13.8, p < .01$), positive reframing ($x^2 = 8.7, p < .05$), humor ($x^2 = 51.6, p < .001$), and religion ($x^2 = 124, p < .001$).

Table 6b.

Three Most Commonly Used Coping Strategies by Race/Ethnicity (N=4,148)

Coping Strategies	Non-Hispanic White (*N*=2722)		Hispanic (*N*=806)		Non-Hispanic Black (*N*=416)		Other (*N*=204)		x^2
	N	%	*N*	%	*N*	%	*N*	%	
Self-Distraction***	1063	39.1	336	41.7	126	30.3	80	39.2	**15.6**
Active Coping	741	27.2	224	27.8	101	24.3	61	29.9	2.7
Denial	62	2.3	26	3.2	16	3.8	5	2.5	4.9
Substance Use**	204	7.5	35	4.3	21	5	11	5.4	**12.4**
Emotional Support	580	21.3	174	21.4	104	25	36	17.6	4.9
Instrumental Support	227	8.3	80	9.9	35	8.4	16	7.8	2.2
Behavioral Disengagement**	203	7.5	43	5.3	15	3.6	16	7.8	**11.7**
Venting**	437	16.1	112	13.9	40	9.6	25	12.3	**13.8**
Positive Reframing*	488	17.9	157	19.5	98	23.6	33	16.2	**8.7**
Planning	582	21.4	160	19.9	94	22.6	57	27.9	6.6
Humor***	672	24.7	125	15.5	60	14.4	30	14.7	**51.6**
Acceptance	1424	52.3	416	51.6	216	51.9	112	54.9	0.7
Religion***	669	24.6	298	37	201	48.3	59	28.9	**124**
Self-Blame	60	2.2	21	2.6	6	1.4	4	2	1.8
Other	221	8.1	54	6.7	19	4.6	14	6.9	7.6

p< .05*, .01**, .001***

Coping in WTC Responders while Controlling for Covariates

Further, in Tables 7a through 7c we find that compared to Non-Hispanic White responders, after adjusting for sociodemographic and clinical characteristics, Hispanic (OR= 1.776, *p* < .001) and Non-Hispanic Black responders (OR= 2.653, *p* < .001) were more likely to report using religion and positive reframing (OR= 1.477, *p* < .01) as modes of coping, and less likely to report using humor, venting, behavioral disengagement, and substances to cope. Non-Hispanic Black responders were also less likely to report using self-distraction than Non-Hispanic White responders.

Additionally, responders who identified as female were more likely to use religion (OR=

1.518, $p < .001$) as a mode of coping and less likely to use humor. Responders who are working are more likely to report using self-distraction (OR= 1.473, $p < .001$) and less likely to use substances to cope. Conversely, responders with a higher income are less likely to use self-distraction and more likely to report using planning (OR= 1.145, $p < .01$) and humor (OR= 1.1.49, $p < .01$) as modes of coping. Also, noteworthy is the significant association between having a prior psychiatric diagnosis and being more likely to report using maladaptive coping skills, including substance use (OR= 2.275, $p < .001$) and venting (OR= 1.544, $p < .001$). Further, we find that having a prior psychiatric diagnosis is negatively associated with using adaptive coping strategies, such as active coping and positive reframing. The results similarly show that responders who report higher rates of perceived preparedness are more likely to report using active coping (OR= 1.078, $p < .01$) and positive reframing (OR= 1.133, $p < .001$) as modes of coping. Further, there is a negative association between reporting higher rates of perceived preparedness and using self-distraction, substance use, behavioral disengagement, and venting as modes of coping.

Table 7a

Separate Logistic Regressions with Each Coping Strategy as the Dependent Variable (N=4,148)

Predictor Variables	Self-Distraction			Active Coping			Substance Use		
	B	OR[1]	95% CI[2]	B	OR	95% CI	B	OR	95% CI
COVARIATES									
Age	-.005	.995	.99-1.00	.005	1.005	.99-1.01	-.014	.986	.97-1.00
Sex									
Male (reference)									
Female	.215	1.240*	1.01-1.52	-.099	.906	.72-1.14	-.398	.672	.44-1.04
Education									
High School or Less (reference)									
More than High School	-.101	.904	.77-1.06	.061	1.063	.89-1.27	-.024	.977	.71-1.34
Marital Status Never Married (reference)									
Married or Partnered	-.005	.995	.94-1.05	-.034	.967	.91-1.03	-.047	.954	.86-1.06
Income (range 0-120K+)	-.182	**.834*****	.77-.91	.091	1.095*	1.00-1.19	-.090	.914	.78-1.08
Work									
Yes	.388	**1.473*****	1.25-1.73	.1	1.106	.93-1.32	-.403	**.668****	.49-.92
Pre-9/11 History Any diagnosis of depression, anxiety, PTSD prior to 9/11									
Yes	-.142	.868	.70-1.08	-.323	**.724****	.56-.93	.822	**2.275*****	1.64-3.15
Number of life stressors before 9/11 (Mean, SD)	.026	1.027	.98-1.08	.037	1.038	.98-1.06	-.014	.986	.90-1.08
WTC-Related Variables Trauma Exposure (range 0-10)	0	1	.97-1.03	.033	1.033	.99-1.07	-.023	.977	.91-1.05
Perceived preparedness	-.064	**.938****	.89-.99	.076	**1.078****	1.02-1.14	-.145	**.865****	.78-.96
Social support while working at WTC site Number of important sources of family support while working at WTC site (Mean, SD)	-.057	.945*	.90-.99	.028	1.028	.98-1.08	.021	1.021	.93-1.12
Number of sources of work support while working at WTC site (Mean, SD)	.054	1.055	.96-1.16	.002	1.002	.90-1.11	-.082	.921	.76-1.12

p< .05*, .01**, .001***

[1] OR=Odds Ratio
[2] CI=Confidence Interval

Table 7a. (Con't.)

Separate Logistic Regressions with Each Coping Strategy as the Dependent Variable (N=4,148)

Predictor Variables	Self-Distraction			Active Coping			Substance Use		
	B	OR	95% CI	B	OR	95% CI	B	OR	95% CI
Post-9/11 Variables									
Diagnosed with asthma after 9/11									
Yes	.177	1.193*	1.03-1.39	-.229	**.796****	.68-.94	.107	1.113	.82-1.51
Diagnosed with GERD after 9/11									
Yes	.202	**1.224****	1.06-1.42	-.056	.945	.81-1.11	.453	**1.573****	1.15-2.14
Diagnosed with sinusitis after 9/11									
Yes	.137	1.147	.99-1.33	.045	1.046	.89-1.23	-.071	.931	.68-1.27
Number of life stressors since 9/11 (Mean, SD)	.045	1.046*	1.01-1.09	-.007	.993	.95-1.04	.138	**1.148*****	1.07-1.23
RACE/ETHNICITY									
Non-Hispanic White (reference)									
Non-Hispanic Black	-.481	**.618*****	.48-.79	-.121	0.886	.68-1.15	-.541	.582*	.34-1.00
Hispanic	-.044	.957	.79-1.15	.123	1.131	.93-1.38	-.681	**.506*****	.34-.76
Other	-.048	0.953	.69-1.30	.142	1.152	.83-1.60	-.746	.474	.22-1.04

p< .05*, .01**, .001***

Table 7b

Separate Logistic Regressions with Each Coping Strategy as the Dependent Variable (N=4,148)

Predictor Variables	Behavioral Disengagement			Venting			Positive Reframing		
	B	OR	95% CI	B	OR	95% CI	B	OR	95% CI
COVARIATES									
Age	.005	1.005	.99-1.02	-.005	.995	.98-1.01	-.001	.999	.99-1.01
Sex									
Male (reference)									
Female	-.11	.895	.59-1.35	-.142	.868	.65-1.15	-.249	.779	.59-1.03
Education									
High School or Less (reference)									
More than High School	.020	1.02	.75-1.39	.141	1.151	.92-1.44	.008	1.008	.83-1.23
Marital Status Never Married (reference)									
Married or Partnered	-.024	.976	.88-1.09	.004	1.004	.93-1.08	-.048	.953	.89-1.03
Income (range 0-120K+)	-.123	.885	.75-1.04	-.039	.961	.86-1.08	.031	1.031	.93-1.14
Work									
Yes	-.024	.976	.71-1.34	.010	1.01	.81-1.26	.066	1.068	.88-1.30
Pre-9/11 History									
Any diagnosis of depression, anxiety, PTSD prior to 9/11									
Yes	.413	1.511*	1.07-2.14	.434	**1.544***	1.19-1.99	-.446	**.640**	.47-.87
Number of life stressors before 9/11 (Mean, SD)	-.029	.971	.89-1.06	-.007	.993	.93-1.06	.04	1.041	.98-1.11
WTC-Related Variables									
Trauma Exposure (range 0-10)	.06	1.062	.99-1.14	-.052	.949*	.91-.99	.025	1.025	.98-1.07
Perceived preparedness	-.187	**.829***	.75-.92	-.100	**.905**	.85-.97	.125	**1.133***	1.07-1.20
Social support while working at WTC site									
Number of important sources of family support while working at WTC site (Mean, SD)	-.137	**.872**	.796-.954	-.038	.963	.91-1.03	.026	1.027	.97-1.09
Number of sources of work support while working at WTC site (Mean, SD)	-.044	.957	.79-1.17	.015	1.015	.89-1.16	.087	1.091	.97-1.23
Post-9/11 variables									
Diagnosed with asthma after 9/11									
Yes	.14	1.151	.86-1.55	.086	1.090	.89-1.34	-.098	.907	.75-1.09

p< .05*, .01**, .001***

Table 7b. (Con't.)

Separate Logistic Regressions with Each Coping Strategy as the Dependent Variable (N=4,148)

Predictor Variables	Behavioral Disengagement			Venting			Positive Reframing		
	B	OR	95% CI	B	OR	95% CI	B	OR	95% CI
COVARIATES									
Diagnosed with GERD after 9/11									
Yes	.362	1.436*	1.06-1.94	.238	1.269*	1.04-1.55	-.135	.874	.73-1.05
Diagnosed with sinusitis after 9/11									
Yes	.267	1.306	.96-1.78	.160	1.173	.95-1.44	-.046	.955	.79-1.15
Number of life stressors since 9/11 (Mean, SD)	.106	**1.112**	1.04-1.19	.046	1.047	.99-1.10	-.055	.947*	.90-.95
RACE/ETHNICTY									
Non-Hispanic White (reference)									
Non-Hispanic Black	-1.075	**.341***	.18-.66	-.555	**.574**	.39-.83	.39	**1.477**	1.13-1.94
Hispanic	-.533	**.587**	.39-.87	-.261	.770*	.59-.99	.266	1.305*	1.04-1.63
Other	.163	1.177	.68-2.04	-.497	.609*	.38-.99	-.108	.897	.59-1.34

p < .05*, .01**, .001***

Table 7c.

Separate Logistic Regressions with Each Coping Strategy as the Dependent Variable (N=4,148)

Predictor Variables	Humor			Religious Coping		
	B	OR	95% CI	B	OR	95% CI
COVARIATES						
Age	-.004	.996	.99-1.01	.019	**1.019***	1.01-1.03
Sex						
Male (reference)						
Female	-.445	**.641****	.49-.85	.417	**1.518***	1.2-1.87
Education						
High School or Less (reference)						
More than High School	.315	**1.370****	1.13-1.67	.111	1.117	.94-1.33
Marital Status						
Never Married (reference)						
Married or Partnered	.021	1.021	.95-1.09	.039	1.04	.98-1.11
Income (range 0-120K+)	.139	**1.149****	1.04-1.27	-.040	.961	.88-1.05
Work						
Yes	-.003	.997	.83-1.20	-.148	.862	.73-1.02
Pre-9/11 History						
Any diagnosis of depression, anxiety, PTSD prior to 9/11						
Yes	-.096	.908	.70-1.18	-.278	.757*	.59-.96
Number of life stressors before 9/11 (Mean, SD)	-.015	.985	.93-1.05	-.002	0.998	.95-1.05

p< .05*, .01**, .001***

Table 7c. (Con't.)

Separate Logistic Regressions with Each Coping Strategy as the Dependent Variable (N=4,148)

Predictor Variables	Humor			Religious Coping		
	B	OR	95% CI	B	OR	95% CI
WTC-Related Variables						
Trauma Exposure (range 0-10)	.021	1.021	.98-1.06	-.021	.980	.94-1.02
Perceived preparedness	.001	1.001	.95-1.06	-.009	.991	.94-1.05
Social support while working at WTC site						
Number of important sources of family support while working at WTC site (Mean, SD)	.008	1.008	.96-1.06	.065	**1.067****	1.02-1.12
Number of sources of work support while working at WTC site (Mean, SD)	.027	1.028	.92-1.15	-.016	.984	.89-1.09
Post-9/11 Variables						
Diagnosed with asthma after 9/11						
Yes	-.102	.903	.76-1.08	-.062	.940	.79-1.11
Diagnosed with GERD after 9/11						
Yes	-.073	.930	.79-1.10	.065	1.068	.91-1.25
Diagnosed with sinusitis after 9/11						
Yes	-.01	.990	.83-1.18	.017	1.018	.86-1.19
Number of life stressors since 9/11 (Mean, SD)	-.009	.991	.95-1.04	.008	1.008	.97-1.05
RACE/ETHNICITY						
Non-Hispanic White (reference)						
Non-Hispanic Black	-.588	**.555*****	.41-.76	0.976	**2.653*****	2.10-3.35
Hispanic	-.395	**.674*****	.54-.85	0.574	**1.776*****	1.47-2.15
Other	-.635	**.530****	.35-.80	.261	1.298	.93-1.81

p< .05*, .01**, .001***

A one-way ANOVA was conducted to compare mean scores of perceived social support and positive religious coping in WTC responders by race/ethnicity. Table 8 presents results that reveal a significant difference between mean scores of perceived social support at the $p < .001$ level for Non-Hispanic White, Hispanic, Non-Hispanic Black, and Other responders [F(3, 4144) = 27.63, $p < .001$]. We further find significant differences between mean scores of positive religious coping at the $p <.001$ level for responders by race/ethnicity [F(3, 4144) = 100.99, $p < .001$]. Specifically, we find that Non-Hispanic White responders (Mean=17.54, SD=5.54) report a higher mean score of perceived social support than other responders. Conversely, Hispanic responders report the lowest mean score of perceived social support (Mean=15.58, SD=5.85). Further, Non-Hispanic Black (Mean=6.02, SD=2.31) and Hispanic (Mean=5.44, SD=2.4) responders report a higher mean score of positive religious coping than Non-Hispanic White and Other responders.

Table 8.

Descriptive Statistics of Perceived Social Support and Positive Religious Coping in WTC Responders by Race/Ethnicity (N=4,148)

	Non-Hispanic White (*N*=2722)		Hispanic (*N*=806)		Non-Hispanic Black (*N*=416)		Other (*N*=204)		
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	F
Perceived Social Support	17.54	5.54	15.58	5.85	16.39	5.83	16.3	5.71	27.63***
Positive Religious Coping	4.13	2.64	5.44	2.4	6.02	2.31	4.5	2.72	100.9***

$p<.05*, .01**, .001***$

Further, Table 9 presents results from regression analyses examining the association between race/ethnicity and perceived social support in WTC responders, while controlling for WTC-related trauma exposure, demographics (age, sex, education, income, employment status, marital status), and clinical and psychosocial characteristics. Here we found that Hispanic responders are significantly less likely to report experiencing perceived social support than Non-Hispanic White responders ($\beta = -.083$, $p < .001$). Further, we found that responders who report having a higher level of education ($\beta = .047$, $p < .01$), higher income ($\beta = .123$, $p < .001$), perceived preparedness ($\beta = .136$, $p < .001$), and trauma exposure ($\beta = .047$, $p < .01$) were more likely to report experiencing perceived social support. Conversely, responders diagnosed with asthma and reporting a higher number of life stressors since 9/11 were less likely to experience perceived social support.

Table 9.

*Multiple Linear Regression Analyses Predicting the Effects of Race/Ethnicity
on Perceived Social Support in WTC Responders (N=4,148)*

Predictor Variables	MOSS	
	$\Delta R2$	Standardized β
Step 1	.073***	
Age		-.018
Sex		
Male (reference)		
Female		-.011
Education		
High school or less (reference)		
More than high school		**.047****
Marital Status		
Not Married (reference)		
Married or Partnered		.002
Income (range 0-120K)		**.123*****
Work		
Yes		-.013
Any diagnosis of depression, anxiety, PTSD prior to 9/11		
Yes		-.023
Number of life stressors before 9/11		.016
WTC-related trauma exposures		**.047****
Perceived preparedness		**.136*****
Diagnosed with asthma after 9/11		
Yes		**-.078*****
Diagnosed with GERD after 9/11		
Yes		-.012
Diagnosed with sinusitis after 9/11		
Yes		.016
Number of life stressors since 9/11		**-.062*****
Step 2	.007***	
Non-Hispanic White (reference)		
Non-Hispanic Black		-.038*
Hispanic		**-.083*****
Other		-.036*

p< .05*, .01**, .001***

Table 10 shows results of multiple linear regression analyses examining the association between race/ethnicity and positive religious coping, while controlling for WTC-related trauma exposure, demographics (age, sex, education, income, employment status, marital status), and clinical and psychosocial characteristics. Here we found that Hispanic (β= .190, p < .001) and Non-Hispanic Black responders (β= .199, p < .001) are significantly more likely than Non-Hispanic White responders to report using positive religious coping. Further, responders who are older (β= .100, p < .001), identify as female (β= .076, p < .001), and report higher sources of family support (β= .096, p < .001) while working at the WTC site are more likely to report using positive religious coping. Conversely, responders with a higher income (β = -.06, p < .001) and a prior psychiatric diagnosis (β = -.046, p < .01) are less likely to report using positive religious coping.

Table 10.

Multiple Linear Regression Analyses Predicting the Effects of Race/Ethnicity on Positive Religious Coping in WTC Responders (N=4,148)

Predictor Variables	Positive Religious Coping	
	$\Delta R2$	Standardized β
Step 1	.040***	
Age		**.100***
Sex		
Male (reference)		
Female		**.076***
Education		
High school or less (reference)		
More than high school		-.017
Marital Status		
Not Married (reference)		
Married or Partnered		.008
Income (range 0-120K)		-.06
Work		
Yes		.019
Any diagnosis of depression, anxiety, PTSD prior to 9/11		
Yes		-.046
Number of life stressors before 9/11		.001
Perceived preparedness		.014
Number of important sources of family support while working at WTC site		**.096***
Number of sources of work support while working at WTC site		-.001
WTC-related trauma exposures		-.004
Diagnosed with asthma after 9/11		
Yes		-.006
Diagnosed with GERD after 9/11		
Yes		-.006
Diagnosed with sinusitis after 9/11		
Yes		.009
Number of life stressors since 9/11		.005
Step 2	.056***	
Non-Hispanic White (reference)		
Non-Hispanic Black		**.199***
Hispanic		**.190***
Other		.028

p< .05*, .01**, .001***

Coping among Hispanic WTC Responders

Table 11a shows results of cross tabulations examining the three coping strategies most commonly used among Hispanic WTC responders by language preference (Spanish vs. English) in completing the survey. Here we find that both Hispanic responders who completed the survey in Spanish and those who completed the survey in English report most often using self-distraction, acceptance, and religion as modes of coping since 9/11. However, there are some differences in their coping. While both selected religion as their third most commonly used mode of coping, Hispanic responders who completed the survey in Spanish identified self-distraction as their most common mode of coping and acceptance as their second most common coping strategy, whereas those who completed the survey in English reported the reverse.

Table 11a.

Three Most Commonly Used Coping Strategies among Hispanic WTC Responders by Language Preference (N=806)

Coping Strategies	Spanish Survey (*N*=191)	English Survey (*N*=615)
Self-Distraction	1	2
Active Coping		
Denial		
Substance Use		
Emotional Support		
Instrumental Support		
Behavioral Disengagement		
Venting		
Positive Reframing		
Planning		
Humor		
Acceptance	2	1
Religion	3	3
Self-Blame		
Other		

Additional differences were noted when comparing coping among Hispanic WTC responders by language preference. The results presented in Table 11b show that there were significant differences in the use of self-distraction ($x^2 = 27.8$, $p = .001$), denial ($x^2 = 10.3$, $p = .001$), emotional support ($x^2 = 10.1$, $p = .01$), instrumental support ($x^2 = 22.3$, $p = .001$), religion ($x^2 = 5.3$, $p = .05$), planning ($x^2 = 15.4$, $p = .001$), humor ($x^2 = 12.8$, $p = .001$), and self-blame ($x^2 = 13.3$, $p = .001$) among Hispanic responders by language preference.

Table 11b:

Coping Strategies among Hispanic WTC Responders by Language Preference N=(806)

Coping Strategies	Spanish Survey (N=191)		English Survey (N=615)		
	n	%	n	%	x^2
Self-Distraction***	111	58.1	225	36.6	**27.8**
Active Coping	46	24.1	178	28.9	1.7
Denial***	13	6.8	13	2.1	**10.3**
Substance Use	6	3.1	29	4.7	0.9
Emotional Support**	57	29.8	117	19	**10.1**
Instrumental Support***	36	18.8	44	7.2	**22.3**
Behavioral Disengagement	9	4.7	34	5.5	0.2
Venting	19	9.9	93	15.1	3.3
Positive Reframing	33	17.3	124	20.2	0.8
Planning***	19	9.9	141	22.9	**15.4**
Humor***	14	7.3	111	18	**12.8**
Acceptance	90	47.1	326	53	2
Religion*	84	44	214	34.8	**5.3**
Self-Blame***	12	6.3	9	1.5	**13.3**
Other	7	3.7	47	7.6	3.7

p< .05, .01**, .001****

Table 12a provides results of crosstab correlations examining the three coping strategies most commonly used among Hispanic responders by US nativity. Here we similarly find that Hispanic responders born abroad and those born in the United States report most often using the same three coping strategies: acceptance, self-distraction, and religion. While they report most commonly using the same three coping skills, there are some differences in their coping that are presented in Table 12b.

Table 12a.

Three Most Commonly Used Coping Strategies among Hispanic WTC Responders by US Nativity (N=805)

Coping Strategies	US Born (N=479)	Born Abroad (N=326)
Self-Distraction	2	2
Active Coping		
Denial		
Substance Use		
Emotional Support		
Instrumental Support		
Behavioral Disengagement		
Venting		
Positive Reframing		
Planning		
Humor		
Acceptance	1	1
Religion	3	3
Self-Blame		
Other		

When comparing the Hispanic WTC responders coping by US nativity, we find in Table 12b that there are significant differences in their use of self-distraction ($x^2 = 6.8, p = .01$), denial ($x^2 = 9.2, p = .01$), instrumental support ($x^2 = 4.7, p = .05$), substances ($x^2 = 6.4, p = .01$), and humor ($x^2 = 16.7, p = .001$).

Table 12b.

Coping Strategies among Hispanic WTC Responders by US Nativity (N=805)

Coping Strategies	Born in US (*N=479*)		Born Abroad (*N=326*)		
	N	%	N	%	x^2
Self-Distraction**	182	38	154	47.2	**6.8**
Active Coping	131	27.3	92	28.2	0.1
Denial**	8	1.7	18	5.5	**9.2**
Substance Use**	28	5.8	7	2.1	**6.4**
Emotional Support	93	19.4	81	24.8	3.4
Instrumental Support*	38	7.9	41	12.6	**4.7**
Behavioral Disengagement	23	4.8	20	6.1	0.7
Venting	75	15.7	37	11.3	3
Positive Reframing	100	20.9	57	17.5	1.4
Planning	102	21.3	58	17.8	1.5
Humor***	95	19.8	30	9.2	**16.7**
Acceptance	248	51.8	168	51.5	0
Religion	168	35.1	130	39.9	1.9
Self-Blame	9	1.9	12	3.7	2.5
Other	32	6.7	22	6.7	0

p< .05, .01**, .001***

Table 13 shows results of crosstab correlations examining the three coping strategies most commonly used among Hispanic responders who completed the survey in Spanish by ethnic sub-group. Given the small sample size (n=191) we are unable to derive at any statistically significant findings. However, we find that among Hispanic responders who completed the survey in Spanish, Ecuadorians and Colombians report most commonly using the same three coping skills (self-distraction, acceptance, and religion) and we find some variation in coping among Hispanic responders from the Dominican Republic, Mexico, Puerto Rico, and other Latin American countries. We find that responders from the Dominican Republic report most commonly using self-distraction, active coping, and emotional support as modes of coping. We

find that responders from Mexico report most commonly using acceptance, religion, emotional

support, instrumental support, venting, positive reframing, and humor as modes of coping.

Puerto Ricans report most often using self-distraction, emotional support, and venting as modes

of coping. Last, other Hispanic responders most often report coping through self-distraction,

social support, acceptance, and religion.

Table 13.

Three Most Commonly Used Coping Strategies among Hispanics Who Completed the Survey in Spanish by Birthplace (N=191)

Coping Strategies	Ecuador (*N*=70)	Colombia (*N*=43)	Dominican Republic (*N*=13)	Mexico (*N*=3)	Puerto Rico (*N*=1)	Other (*N*=61)
Self-Distraction	1	2	1		1	1
Active Coping			2			
Denial						
Substance Use						
Emotional Support			3	2	1	
Instrumental Support				2		
Behavioral Disengagement						
Venting				2	1	
Positive Reframing				2		
Planning						
Humor				2		
Acceptance	2	1		1		3
Religion	3	3		1		3
Self-Blame						
Other						

Coping in Hispanic Responders while Controlling for Covariates

Tables 14a through 14d present results from individual regression analyses examining the

relationship between language preference (Spanish vs. English) and US nativity to 12 coping

strategies (self-distraction, active coping, denial, substance use, emotional support, instrumental

support, venting, planning, humor, religion, and self-blame) in Hispanic WTC responders, while

controlling for WTC-related trauma exposure, demographics (age, sex, education, income, employment status, marital status), and clinical and psychosocial characteristics. The findings reveal that among Hispanics, responders who completed the survey in Spanish are more likely to report using self-distraction (OR= 2.533, *p* < .001), instrumental support (OR= 2.870, *p* < .01), and venting (OR= .423, *p* < .05) as modes of coping. Further, Hispanic responders who were born abroad are less likely to report using substances and humor as modes of coping.

Also noteworthy are some of the psychosocial and clinical characteristics associated with the Hispanic responders' coping strategies. The findings reveal that older age (OR= 1.031, *p* < .01) and female gender (OR= 2.907, *p* < .001) are significantly associated with using religion as a mode of coping. Further, higher income was negatively associated with using religion to cope. However, there were no significant differences in the use of religion among Hispanic responders by language preference or US nativity.

We also find that higher income is associated with planning (OR= 1.338, *p* < .05) and negatively associated with substance use, seeking instrumental support, and turning to religion as modes of coping. Moreover, responders who report current employment are significantly more likely to report using self-distraction (OR= 1.550, *p* < .05) and self-blame (OR= 8.028, *p* < .05) as modes of coping and less likely to report using instrumental support. Further, we find that WTC-related trauma exposure severity is significantly associated with the use of active coping (OR= 1.094, *p* < .05) and planning (OR= 1.107, *p* < .05). Additionally, we find that perceived preparedness is negatively associated with venting. Last, we find that reports of higher family support (OR= .886, *p* < .05) and work support (OR= 1.263, *p* < .05) while working at the WTC site are associated with using self-distraction and active coping (OR= 1.166, *p* < .01) in Hispanic responders.

Table 14a.

Separate Logistic Regressions with Each Coping Strategy as the Dependent Variable (N=806)

Predictor Variables	Self-Distraction			Active			Denial		
	B	OR	95% CI	B	OR	95% CI	B	OR	95% CI
COVARIATES									
Age	.009	1.009	.99-1.03	.011	1.011	.99-1.04	.014	1.014	.95-1.08
Sex									
Male (reference)									
Female	.329	1.389	92-2.09	-.150	.861	.54-1.38	-1.023	.36	.08-1.72
Education High School or Less (reference)									
More than High School	-.033	.967	.67-1.40	.075	1.078	.72-1.61	-.159	.853	.29-2.51
Marital Status									
Never Married (reference)									
Married or Partnered	.015	1.015	.89-1.16	.011	1.011	.88-1.17	-.134	.875	.59-1.28
Income (range 0-120K+)	-.195	.823	.66-1.02	.043	1.044	.84-1.31	-.277	.758	.38-1.51
Work									
Yes	.438	**1.550***	1.06-2.27	.073	1.076	.95-1.22	-.302	.739	.23-2.39
Pre-9/11 History									
Any diagnosis of depression, anxiety, PTSD prior to 9/11									
Yes	-.402	.669	.39-1.16	.041	1.042	.58-1.87	.225	1.252	.24-6.47
Number of life stressors before 9/11 (Mean, SD)	.043	1.044	.93-1.17	-.005	.995	.88-1.13	.064	1.066	.76-1.50
WTC-Related Variables									
Trauma Exposure (range 0-10)	.041	1.042	.96-1.14	.09	**1.094***	1.00-1.19	-.129	.879	.68-1.13
Perceived preparedness	-.031	.97	.86-1.09	.073	1.076	.95-1.22	-.368	.692	.46-1.05
Social support while working at WTC site									
Number of important sources of family support while working at WTC site (Mean, SD)	-.121	**.886***	.79-.99	.153	**1.166****	1.04-1.31	-.196	.822	.58-1.16
Number of sources of work support while working at WTC site (Mean, SD)	.233	**1.263***	.99-1.60	-.095	.909	.71-1.17	-.060	.942	.44-2.02
Post-9/11 Variables Diagnosed with asthma after 9/11									
Yes	.147	1.158	.81-1.66	-.291	.748	.51-1.11	.487	1.627	.53-4.97

p< .05, .01**, .001***

Table 14a. (Con't.)

Separate Logistic Regressions with Each Coping Strategy as the Dependent Variable (N=806)

Predictor Variables	Self-Distraction			Active			Denial		
	B	OR	95% CI	B	OR	95% CI	B	OR	95% CI
COVARIATES									
Diagnosed with GERD after 9/11									
Yes	.231	1.26	.88-1.81	-.097	.908	.62-1.33	.0	1.0	.32-3.13
Diagnosed with sinusitis after 9/11									
Yes	.057	1.059	.74-1.53	-.041	.96	.65-1.42	-.323	.724	.23-2.27
Number of life stressors since 9/11 (Mean, SD)	-.001	.999	.92-1.09	-.023	.978	.89-1.08	-.113	.893	.67-1.19
US NATVITY[3]									
US Born (reference)									
Born Abroad									
LANGUAGE PREFERENCE									
English (reference)									
Spanish Survey	.929	**2.533***	1.49-4.31						

p< .05*, .01**, .001***

[3] Forward Wald method was used in a separate step for US nativity and language due to possible collinearity

Table 14b:

Separate Logistic Regressions with Each Coping Strategy as the Dependent Variable (N=806)

Predictor Variables	Substance Use			Emotional Support			Instrumental Support		
	B	OR	95% CI	B	OR	95% CI	B	OR	95% CI
COVARIATES									
Age	.015	1.015	.96-1.07	-.001	.999	.97-1.03	-.010	.99	.96-1.03
Sex									
Male (reference)									
Female	-.666	0.514	.19-1.42	.298	1.347	.83-2.19	-.321	.725	.36-1.47
Education High School or Less (reference)									
More than High School	.935	**2.548***	.99-6.54	-.056	.945	.61-1.47	.352	1.422	.74-2.72
Marital Status									
Never Married (reference)									
Married or Partnered	.074	1.077	.80-1.45	.079	1.083	.92-1.27	-.128	.88	.71-1.09
Income (range 0-120K+)	-.599	**.549***	.32-.95	.095	1.1	.86-1.42	-.138	.871	.59-1.29
Work									
Yes	.642	1.901	.77-4.72	-.063	.939	.59-1.48	-.782	**.457***	.24-.89
Any diagnosis of depression, anxiety, PTSD prior to 9/11									
Yes	.731	2.077	.82-5.25	.187	1.206	.66-2.21	.347	1.414	.59-3.37
Number of life stressors before 9/11 (Mean, SD)	-.21	.811	.63-1.04	-.064	.938	.82-1.07	-.044	.957	.79-1.15
WTC-Related Variables									
Trauma Exposure (range 0-10)	-.100	.905	.74-1.10	-.012	.988	.89-1.09	.014	1.014	.87-1.18
Perceived preparedness	-.124	.884	.66-1.18	.038	1.039	.90-1.19	.076	1.079	.88-1.32
Social support while working at WTC site Number of important sources of family support while working at WTC site (Mean, SD)	-.082	.921	.71-1.19	.087	1.091	.96-1.25	.018	1.019	.84-1.24
Number of sources of work support while working at WTC site (Mean, SD)	.145	1.155	.66-2.02	.116	1.123	.85-1.49	.100	1.105	.74-1.66
Post-9/11 Variables Diagnosed with asthma after 9/11									
Yes	-.487	.614	.27-1.42	.075	1.078	.69-1.66	.556	1.743	.93-3.28

p< .05*, .01**, .001***

Table 14b. (Con't.)

Separate Logistic Regressions with Each Coping Strategy as the Dependent Variable (N=806)

Predictor Variables	Substance Abuse			Emotional Support			Instrumental Support		
	B	OR	95% CI	B	OR	95% CI	B	OR	95% CI
COVARIATES									
Diagnosed with GERD after 9/11									
Yes	1.447	**4.249****	1.48-12.24	.049	1.05	.68-1.63	-.448	.639	.34-1.21
Diagnosed with sinusitis after 9/11									
Yes	.013	1.013	.43-2.41	.099	1.104	.71-1.72	-.061	.941	.49-1.80
Number of life stressors since 9/11 (Mean, SD)	.170	**1.185***	.99-1.41	.094	1.098	.99-1.21	.085	1.089	.95-1.25
US NATIVITY									
US Born (reference)									
Born Abroad	-1.361	**.256****	.09-.69						
LANGUAGE PREFERENCE									
English (reference)									
Spanish Survey							1.054	**2.870****	1.25-6.57

p< .05*, .01**, .001***

Table 14c.

Logistic Regressions with Each Coping Strategy as the Dependent Variable (N=806)

Predictor Variables	Venting			Planning			Humor		
	B	OR	95% CI	B	OR	95% CI	B	OR	95% CI
COVARIATES									
Age	-.012	.988	.96-1.02	.008	1.008	.98-1.04	.026	1.026	.99-1.06
Sex									
Male (reference)									
Female	.276	1.318	.76-2.27	-.036	.965	.57-1.64	-.647	**.523***	.27-1.00
Education High School or Less (reference)									
More than High School	.277	1.319	.77-2.27	.194	1.214	.77-1.91	.068	1.070	.66-1.73
Marital Status Never Married (reference)									
Married or Partnered	-.059	.942	.79-1.13	-.062	.940	.80-1.10	.099	1.104	.92-1.33
Income (range 0-120K+)	.111	1.117	.83-1.51	.291	**1.338***	1.04-1.72	.159	1.172	.89-1.54
Work									
Yes	-.436	.646	.38-1.09	.007	1.007	.64-1.58	.081	1.085	.66-1.78
Pre-9/11 History Any diagnosis of depression, anxiety, PTSD prior to 9/11									
Yes	-.185	.831	.39-1.77	.124	1.132	.59-2.18	.57	1.768	.90-3.47
Number of life stressors before 9/11 (Mean, SD)	.043	1.044	.90-1.21	.022	1.023	.89-1.18	.106	1.112	.96-1.29
WTC-Related Variables Trauma Exposure (range 0-10)	-.022	.978	.87-1.10	.102	**1.107***	1.00-1.22	-.009	.991	.89-1.10
Perceived preparedness	-.216	**.806***	.68-.96	.084	1.088	.95-1.25	-.142	.868	.74-1.02
Social support while working at WTC site Number of important sources of family support while working at WTC site (Mean, SD)	-.065	.937	.81-1.09	-.055	.947	.83-1.08	.085	1.089	.95-1.25
Number of sources of work support while working at WTC site (Mean, SD)	.222	1.248	.91-1.72	.163	1.177	.89-1.56	-.228	.796	.59-1.08

p< .05*, .01**, .001***

Table 14c. (Con't.)

Logistic Regressions with Each Coping Strategy as the Dependent Variable (N=806)

Predictor Variables	Venting			Planning			Humor		
	B	OR	95% CI	B	OR	95% CI	B	OR	95% CI
COVARIATES									
Post-9/11 Variables									
Diagnosed with asthma after 9/11									
Yes	.188	1.207	.74-1.98	.019	1.02	.66-1.57	-.394	.674	.42-1.09
Diagnosed with GERD after 9/11									
Yes	.157	1.17	.71-1.93	.159	1.172	.76-1.80	-.177	.838	.53-1.33
Diagnosed with sinusitis after 9/11									
Yes	.139	1.149	.69-1.92	-.267	0.766	.49-1.18	.002	1.002	.63-1.60
Number of life stressors since 9/11 (Mean, SD)	.052	1.054	.94-1.18	-.095	.91	.81-1.02	-.114	.893	.79-1.01
US NATIVITY									
US Born (reference)									
Born Abroad							-.769	**.464****	.28-.77
LANGUAGE PREFERENCE									
English (reference)									
Spanish Survey	-.861	**.423***	.18-.98						

p< .05*, .01**, .001***

Table 14d.

Logistic Regressions with Each Coping Strategy as the Dependent Variable (N=806)

Predictor Variables	Religion			Self-Blame		
	B	OR	95% CI	B	OR	95% CI
COVARIATES						
Age	.03	**1.031****	1.01-1.05	-.015	0.985	.89-1.09
Sex						
Male (reference)						
Female	1.067	**2.907*****	1.92-4.40	1.253	3.5	.72-17.02
Education						
High School or Less (reference)						
More than High School	.160	1.173	.81-1.70	-.117	.889	.21-3.76
Marital Status						
Never Married (reference)						
Married or Partnered	.065	1.067	.93-1.22	.364	1.438	.86-2.42
Income (range 0-120K+)	-.226	**.798***	.64-.99	-.390	.385	.28-1.63
Work						
Yes	.099	1.104	.75-1.62	2.083	**8.028***	1.21-53.48
Pre-9/11 History Any diagnosis of depression, anxiety, PTSD prior to 9/11						
Yes	-.469	.626	.36-1.10	1.623	**5.069***	1.18-21.74
Number of life stressors before 9/11 (Mean, SD)	.005	1.005	.89-1.13	.148	1.16	.78-1.74
WTC-Related Variables						
Trauma Exposure (range 0-10)	-.023	.978	.90-1.06	-.064	.938	.68-1.29
Perceived preparedness	-.033	.967	.86-1.09	-.267	.766	.47-1.25
Social support while working at WTC site						
Number of important sources of family support while working at WTC site (Mean, SD)	.064	1.066	.95-1.19	-.004	.996	.63-1.57
Number of sources of work support while working at WTC site (Mean, SD)	-.009	.991	.78-1.26	-.128	.879	.33-2.33

p< .05*, .01**, .001***

Table 14d. (Con't)

Logistic Regressions with Each Coping Strategy as the Dependent Variable (N=806)

Predictor Variables	Religion			Self-Blame		
	B	OR	95% CI	B	OR	95% CI
COVARIATES						
Post-9/11 Variables						
Diagnosed with asthma after 9/11						
Yes	.097	1.102	.76-1.59	.125	1.133	.27-4.82
Diagnosed with GERD after 9/11						
Yes	.219	1.245	.86-1.80	.329	1.39	.320-6.03
Diagnosed with sinusitis after 9/11						
Yes	-.235	.79	.54-1.15	-1.955	**.142***	.03-.74
Number of life stressors since 9/11 (Mean, SD)	-.003	.997	.91-1.09	-.011	.989	.71-1.38
US NATIVITY						
US Born Reference						
Born Abroad						
LANGUAGE PREFERENCE						
English (reference)						
Spanish Survey						

p< .05*, .01**, .001***

An independent samples T-test was also conducted to compare perceived social support and positive religious coping in Hispanic responders by language preference. In Table 15 we find that Hispanic responders who completed the survey in English report a higher mean score of perceived social support (Mean=16.41, SD=5.94) than Hispanic responders who completed the survey in Spanish (Mean=12.93, SD=4.67); $t(397.37)= 8.42$, p < .001. Conversely, Hispanic responders who completed the survey in Spanish report a higher mean score of positive religious coping (Mean=6.08, SD=1.91) than those who completed the survey in English (Mean= 5.25, SD=2.5); $t(410.80)= -4.9$, p < .001. Similarly, in Table 16 we find that Hispanic responders who were born in the United States report a higher mean score of perceived social support

(Mean=16.33, SD=5.76) than those who were born abroad (Mean=14.49, SD 5.83); $t(692.20)=$ 4.40, p < .001. Further, Hispanic responders who were born abroad report a higher mean score of positive religious coping (Mean= 5.79, SD=2.27) than those who are US born (Mean= 5.21, SD=2.46); $t(733.11)=$ -3.5, p < .001.

Table 15.

Descriptive Statistics of Perceived Social Support and Positive Religious Coping in Hispanic WTC Responders by Language Preference (N=806)

	English (*N*=615)		Spanish *N*=191)				
	Mean	SD	Mean	SD	95% CI	*t*	df
Perceived Social Support	16.41	5.94	12.93	4.67	2.67-4.30	8.42***	397.37
Positive Religious Coping	5.25	2.5	6.08	1.91	-1.16 - -.49	-4.9***	410.8

p< .05*, .01**, .001***

Table 16.

Descriptive Statistics of Perceived Social Support and Positive Religious Coping in Hispanic WTC Responders by US Nativity N=805

	US Born (*N*=479)		Born Abroad (*N*=326)				
	Mean	SD	Mean	SD	95% CI	*t*	df
Perceived Social Support	16.33	5.75	14.49	5.83	1.02-2.65	4.40***	692.2
Positive Religious Coping	5.21	2.45	5.79	2.27	-.92 - -.25	-3.5***	733.11

p< .05*, .01**, .001***

Table 17 presents results from regression analyses examining the association between language preference and US nativity in Hispanic responders to perceived social support, while controlling for WTC-related trauma exposure, demographics, and clinical and psychosocial characteristics. Here we find that among Hispanic responders having more than a high school education (β=.083, *p* < .05), reporting a higher income (β=.126, *p* < .01), and higher perceived preparedness (β= .177, *p* < .001) were significantly associated with reporting perceived social support. Conversely, completing the survey in Spanish (β= -.12, *p* < .01) and reporting a higher number of life stressors since 9/11 (β= -.087, *p* < .05) were negatively associated with perceived social support.

Table 17.

Multiple Linear Regression Analyses Predicting the Effects of US Nativity and Language Preference on Perceived Social Support in Hispanic WTC Responders (N=806)

Predictor Variables	MOSS	
	$\Delta R2$	Standardized β
Step 1	.123***	
Age		-.051
Sex		
Male (reference)		
Female		-.016
Education		
High school or less (reference)		
More than high school		.083*
Marital Status		
Not Married (reference)		
Married or Partnered		-.041
Income (range 0-120K)		.126**
Work		
Yes		-.043
Any diagnosis of depression, anxiety, PTSD prior to 9/11		
Yes		.021
Number of life stressors before 9/11		.071
WTC-related trauma exposures		.016
Perceived preparedness		.177***
Diagnosed with asthma after 9/11		
Yes		-.044
Diagnosed with GERD after 9/11		
Yes		-.009
Diagnosed with sinusitis after 9/11		
Yes		-.022
Number of life stressors since 9/11		-.087*
Step 2	.009*	
Born Abroad		
Spanish Survey		-.12**

p< .05*, .01**, .001***

Table 18 shows results of multiple linear regression analyses examining the association between US nativity and language preference in Hispanic responders to positive religious coping, while controlling for WTC-related trauma exposure, demographics (age, sex, marital status, education, income, employment status), and clinical and psychosocial characteristics. Here we find that being older (β= .116, *p* < .01), identifying as female (β= .139, *p* < .001), having a higher number of family supports while working at the WTC site (β= .126, *p* < .01), and completing the survey in Spanish (β= .103, *p* < .05) are significantly associated with positive religious coping.

Table 18.

Multiple Linear Regression Analyses Predicting the Effects of US Nativity and Language Preference on Positive Religious Coping in Hispanic WTC Responders (N=806)

Predictor Variables	Positive Religious Coping	
	ΔR2	Standardized β
Step 1	.066***	
Age		.116**
Sex		
Male (reference)		
Female		.139***
Education		
High school or less (reference)		
More than high school		-.032
Marital Status		
Not Married (reference)		
Married or Partnered		.001
Income (range 0-120K)		-.075
Work		
Yes		.074
Any diagnosis of depression, anxiety, PTSD prior to 9/11		
Yes		-.028
Number of life stressors before 9/11		.035
WTC-related trauma exposures		-.026
Perceived preparedness		.045
Number of important sources of family support while working at WTC site		.126**
Number of important sources of work support while working at WTC site		-.034
Diagnosed with asthma after 9/11		
Yes		-.034
Diagnosed with GERD after 9/11		
Yes		-.02
Diagnosed with sinusitis after 9/11		
Yes		.047
Number of life stressors since 9/11		-.032
Step 2	.006*	
Born Abroad		
Spanish Survey		.103*

p< .05*, .01**, .001***

Summary

This chapter provided an overview of the three most commonly used coping strategies among WTC responders by race/ethnicity, before and after controlling for WTC-related trauma exposure, demographics, and clinical and psychosocial characteristics. Coping strategies used among Hispanic WTC responders were also examined by language preference, US nativity, and birth origin. The results presented suggest that Non-Hispanic Black responders are similar to Hispanic responders in their use of religion to cope. Further, we find that Hispanic responders are less likely than Non-Hispanic White responders to report using substances and humor as modes of coping. Moreover, in examining the association between race/ethnicity and perceived social support, we find that Non-Hispanic White responders are more likely to report experiencing perceived social support than Hispanic, Non-Hispanic Black, and Other responders.

Comparisons among Hispanic responders by language preference and US nativity revealed some differences in coping. Specifically, US-born Hispanic responders appear to look more like Non-Hispanic White responders in reporting a higher use of humor and substance use as modes of coping than Hispanic responders born abroad. Further, Hispanic responders who completed the survey in English were more likely to experience perceived social support than those who completed the survey in Spanish, and Hispanic responders who completed the survey in Spanish were more likely to report using positive religious coping.

These associations will continue to be examined in subsequent chapters. The next chapter presents results on the association between positive religious coping, perceived social support, and active coping to PTSD symptom levels among WTC responders by race/ethnicity, as well as among Hispanics by language preference and US nativity, while controlling for WTC-related trauma exposure, demographics, and clinical and psychosocial characteristics. Results on the

moderation effect of language preference and US nativity on the relationship between active

coping and PTSD in Hispanic responders are also presented.

CHAPTER 6: COPING AND PTSD

This chapter presents results on the association between positive religious coping, perceived social support, and active coping to PTSD symptom levels among WTC responders by race/ethnicity, as well as among Hispanic responders by language preference and US nativity, while controlling for demographic variables, WTC-related trauma exposure, and clinical and psychosocial characteristics. These associations are first examined among WTC responders by race/ethnicity. They are then examined among Hispanic responders by language preference and US nativity. Finally, results on the moderation effect of language preference and US nativity on the relationship between active coping and PTSD among Hispanic responders are presented.

A one-way ANOVA was conducted to compare mean scores of PTSD symptoms in WTC responders by race/ethnicity. Table 19 shows that there was a significant difference between means at the p < .001 level for Hispanic, Non-Hispanic White, Non-Hispanic Black, and Other responders [F(3, 4144)=21.735, p < .001]. Specifically, we find that Hispanic responders have a higher PCL score than Non-Hispanic Black and Non-Hispanic White responders.

Table 19:

Descriptive Statistics of PTSD Symptoms in WTC Responders by Race/Ethnicity (N=4,148)

	Non-Hispanic White (N=2722)		Hispanic (N=806)		Non-Hispanic Black (N=416)		Other (N=204)		
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	F
PCL Score	31.7	15.15	36.63	17.76	31.18	15.65	32.1	15.14	21.735***

p< .05, .01**, .001***

Table 20 shows results of multiple linear regression analyses examining the association of positive religious coping, perceived social support, and active coping with PTSD symptoms in WTC responders, while controlling for WTC-related trauma exposure, demographics (age, sex,

education, income, employment status, marital status, race/ethnicity), and clinical and
psychosocial characteristics. Among responders, those who were married or partnered (β= .039,
$p < .01$), had a prior psychiatric diagnosis (β= .131, $p < .001$), reported greater trauma exposure
(β= .059, $p < .001$), and a higher number of life stressors since 9/11 (β= .163, $p < .001$) were
more likely to report PTSD symptoms. Additionally, those diagnosed with asthma (β= .107, p <
.001), GERD (β= .116, p < .001) and sinusitis (β= .110, p < .001) after 9/11 were more likely to
report higher PTSD symptoms. Conversely, responders with a higher income (β= -.163, $p < .001$)
who are employed (β=-.059, $p < .001$), report perceived preparedness (β=-.097, $p < .001$), report
having life stressors before 9/11 (β=-.039, $p < .01$), higher perceived social support (β= -.213, $p
< .001$) and active coping (β= -.095, $p < .001$) were less likely to report PTSD symptoms.

Table 20.

*Multiple Linear Regression Analyses Predicting the Effects of Positive Religious Coping,
Perceived Social Support, and Active Coping on PTSD Symptom Levels in WTC
Responders (N=4,148)*

Predictor Variables	PCL	
	ΔR2	Standardized β
Step 1	.295***	
Age		.009
Sex		
Male (reference)		
Female		-.01
Education		
High school or less (reference)		
More than high school		-.025
Marital Status		
Not Married (reference)		
Married or Partnered		.039**
Income (range 0-120K)		-.163***
Work		
Yes		-.059***

$p< .05*, .01**, .001***$

Table 20. (Con't.)

Multiple Linear Regression Analyses Predicting the Effects of Positive Religious Coping, Perceived Social Support, and Active Coping on PTSD Symptom Levels in WTC Responders (N=4,148)

Predictor Variables	PCL	
	$\Delta R2$	Standardized β
Any diagnosis of depression, anxiety, PTSD prior to 9/11		
Yes		.131***
Number of life stressors before 9/11		-.039**
Perceived preparedness		-.097***
Number of important sources of family support while working at WTC site		-.01
Number of important sources of work support while working at WTC site		-.013
WTC-related trauma exposures		.059***
Diagnosed with asthma after 9/11		
Yes		.107***
Diagnosed with GERD after 9/11		
Yes		.116***
Diagnosed with sinusitis after 9/11		
Yes		.110***
Number of life stressors since 9/11		.163***
Step 2	.003**	
Non-Hispanic White (reference)		
Non-Hispanic Black		-.018
Hispanic		.038**
Other		-.002
Step 3	.053***	
Positive Religious Coping		-.019
Perceived Social Support		-.213***
Active Coping		-.095***

p< .05*, .01**, .001***

Coping and PTSD among Hispanic Responders

Similar analyses were then conducted among Hispanic responders by language preference and US nativity. An independent samples T-test was conducted to compare mean scores of PTSD symptoms among Hispanic responders by language preference. Table 21 shows that Hispanic responders who completed the survey in Spanish report a higher mean score of PTSD symptoms (Mean=49.15, SD=17.04) than Hispanic responders who completed the survey in English (Mean=32.74, SD=16.11); t(302.84)= -11.77, p < .001. Further, in Table 22 we find that Hispanic responders who are born abroad report higher mean scores of PTSD symptoms (Mean=41.48, SD=18.55) than Hispanic responders who are US born (Mean=33.28, SD=16.40); t(639.79)=-6.45, p < .001.

Table 21.

Descriptive Statistics of PTSD Symptoms in Hispanic WTC Responders by Language Preference (N=806)

	English (*N*=615)		Spanish (*N*=191)		95% CI	*t*	df
	Mean	SD	Mean	SD			
PCL Score	32.74	16.11	49.15	17.04	-19.15 - -13.66	-11.77***	302.84

p< .05*, .01**, .001***

Table 22.

Descriptive Statistics of PTSD Symptoms in Hispanic WTC Responders by US Nativity (N=805)

	US Born (*N*=479)		Born Abroad (*N*=326)		95% CI	*t*	df
	Mean	SD	Mean	SD			
PCL Score	33.28	16.40	41.48	18.55	-10.70 - -5.71	-6.45***	639.79

p< .05*, .01**, .001***

Table 23 shows results of multiple linear regression analyses examining the association between positive religious coping, perceived social support, and active coping to PTSD symptom levels in Hispanic WTC responders by language preference and US nativity, while controlling for WTC-related trauma exposure, demographics (age, sex, education, income, marital status, employment status), and clinical and psychosocial characteristics. Among Hispanic responders, those who report greater trauma exposure (β=.130, $p < .001$), were diagnosed with asthma (β=.071, $p < .05$), GERD (β=.102, $p < .01$), and/or sinusitis (β=.079, $p < .05$) after 9/11, report life stressors since 9/11 (β=.192, $p < .001$), and completed the survey in Spanish (β=.263, $p < .001$) are more likely to report PTSD symptoms. On the other hand, those who report working (β= -.077, $p < .05$), have a higher income (β= -.119, $p < .01$), report higher perceived social support (β= -.179, $p < .001$), and active coping (β = -.104, $p < .001$) are less likely to report PTSD symptoms.

Table 23.

Multiple Linear Regression Analyses Predicting the Effects of Positive Religious Coping, Perceived Social Support, and Active Coping on PTSD Symptom Levels in Hispanic WTC Responders (N=806)

Predictor Variables	PCL	
	ΔR2	Standardized β
Step 1	.325***	
Age		.054
Sex		
Male (reference)		
Female		.021
Education		
High school or less (reference)		
More than high school		.005
Marital Status		
Not Married (reference)		
Married or Partnered		-.001
Income (range 0-120K)		-.119**
Work		
Yes		-.077*
Any diagnosis of depression, anxiety, PTSD prior to 9/11		
Yes		.064
Number of life stressors before 9/11		.002
Perceived preparedness		-.043
Number of important sources of family support while working at WTC site		-.022
Number of important sources of work support while working at WTC site		.003

p< .05, .01**, .001***

Table 23. (Con't.)

Multiple Linear Regression Analyses Predicting the Effects of Positive Religious Coping, Perceived Social Support, and Active Coping on PTSD Symptom Levels in Hispanic WTC Responders (N=806)

Predictor Variables	PCL	
	ΔR2	Standardized β
WTC-related trauma exposures		.130***
Diagnosed with asthma after 9/11		
Yes		.071*
Diagnosed with GERD after 9/11		
Yes		.102**
Diagnosed with sinusitis after 9/11		
Yes		.079*
Number of life stressors since 9/11		.192***
Step 2	.040***	
Born Abroad		
Spanish Survey		.263***
Step 3	.043***	
Positive Religious Coping		-.035
Perceived Social Support		-.179***
Active Coping		-.104***

p< .05*, .01**, .001***

Moderation Effect of US Nativity and Language Preference on Active Coping and PTSD

In the analyses conducted, the main effect of active coping predicted a lower score in PTSD symptoms (B=-4.112, SE=1.199, β=-.104, *p* < .001). When the interaction term of active coping and completing the survey in English was entered into the model we found that there is no significant moderation effect (B=2.600, SE=2.898, β=.061, p=.370). We similarly found that the interaction term of active coping and being born in the United States (B=3.734, SE=2.465, β=.078, p=.130) did not have a conditional effect on the relationship between active coping and PTSD symptoms among Hispanic responders.

The results presented in this chapter were on the association between positive religious

coping, perceived social support, and active coping to PTSD symptoms in WTC responders, and among Hispanic responders by language preference and US nativity. The results presented suggest that there is a significant association between higher PTSD symptom levels and self-identifying as Hispanic; being married or partnered; reporting higher trauma exposure; a higher number of life stressors since 9/11; having a prior diagnosis of depression, anxiety, or PTSD; and being diagnosed with asthma, GERD, or sinusitis. In contrast, responders who report working, have a higher income, report higher perceived preparedness, higher perceived social support, and active coping are less likely to report PTSD symptoms. These findings were similar among Hispanics; however, Hispanic responders who completed the survey in Spanish are more likely to report PTSD symptoms than those who completed the survey in English. Further, we did not find any moderation effects in language preference or US nativity on the relationship between active coping and PTSD symptoms among Hispanic responders.

The next chapter presents results on the association between positive religious coping, perceived social support, and active coping to three different measures of psychological well-being, including posttraumatic growth, positive affect, and quality of life among WTC responders, while controlling for PTSD symptoms, WTC-related trauma exposure, demographics, and clinical and psychosocial characteristics. Results are also provided for Hispanic responders by language preference and US nativity. The chapter will conclude with results on the moderation effect of language preference and US nativity on the relationship between active coping and psychological well-being among Hispanic responders.

CHAPTER 7: COPING AND PSYCHOLOGICAL WELL-BEING

This chapter presents results on the association between positive religious coping, perceived social support, and active coping to three different measures of psychological well-being, including posttraumatic growth, positive affect, and quality of life among WTC responders, while controlling for PTSD symptoms, WTC-related trauma exposure, demographics, and clinical and psychosocial characteristics. These associations are first examined among WTC responders by race/ethnicity. They are then examined among Hispanic responders by language preference and US nativity. Last, results on the moderation effect of language preference and US nativity on the relationship between active coping and psychological well-being in Hispanic responders are presented.

Table 24 presents frequencies of posttraumatic growth, positive affect, and quality of life among the WTC responders who participated in the web-based survey. In this table, we find that responders report a mean score of 22.16 in posttraumatic growth out of a possible total score of 50 on the PTGI. Responders further report a mean score of 3.24 in positive affect out of a possible total mean score of 4 on the PANAS. Last, they report a mean score of 50.21 in quality of life out of a possible total score of 56 on the Q-LES-Q.

Table 24.

Mean, Median, and Range of PTGI, PANAS, and QOL in WTC Responders (N=4,148)

	PTGI Score	Positive Affect Score	QOL Score
Mean	22.16	3.24	50.21
Median	22	3.3	51.75
Range	50	4	56

Table 25 shows results of multiple linear regression analyses examining the relationship between positive religious coping, perceived social support and active coping to experiences of posttraumatic growth, positive affect, and quality of life, while controlling for PTSD, WTC-related trauma exposure, demographics, and clinical and psychosocial characteristics in WTC responders. Among responders, positive religious coping, perceived social support, and active coping are significantly associated with posttraumatic growth (β= .277, p < .001, β= .034, p < .05, β= .071, p < .001), positive affect (β= .144, p < .001, β= .187, p <. 001, β= .082, p < .001), and quality of life (β= .061, p < .001, β= .259, p < .001, β= .054, p < .001). When comparing these associations among responders by race/ethnicity, we found that responders who self-identified as Hispanic (β= .077, p < .001), female (β= .045, p < .01), older (β= .063, p < .001), were working (β= .064, p < .001), reported more sources of family (β= .043, p < .01) and work support (β= .057, p < .001) while working at the WTC site, and reported higher PTSD symptoms (β= .249, p < .001) were more likely to experience posttraumatic growth. Further, responders who were older (β= .047, p < .01), identified as female (β= .028, p < .05), were working (β= .096, p < .001), reported a higher income (β= .069, p < .001), higher perceived preparedness (β= .052, p < .001), more sources of family support (β= .059, p < .001) while working at the WTC site, and a higher number of trauma exposures (β= .060, p < .001) were more likely to report positive affect. Conversely, responders who reported higher PTSD symptoms (β= -.293, p < .001), had a prior psychiatric diagnosis (β=-.034, p < .01), and were diagnosed with GERD after 9/11 were less likely to report positive affect. Similarly, responders who were older (β= .067, p < .001), working (β= .056, p < .001), reported a higher income (β= .093, p < .001), and a higher number of WTC-related trauma exposures (β= .032, p < .01) were more likely to report a higher quality of life. Further, responders who reported higher PTSD symptoms (β= -.479, p < .001),

were diagnosed with asthma (β= -.053, *p* < .001) or GERD (β= -.05, *p* < .001) after 9/11 were

less likely to report a higher quality of life.

Table 25.

Multiple Linear Regression Analyses Predicting Well-Being in WTC Responders (N=4,148)

	PTGI		PANAS		QOL	
Predictor Variables	ΔR2	Standardized β	ΔR2	Standardized β	ΔR2	Standardized β
Step 1	.084***		.255***		.493***	
Age		.063***		.047**		.067***
Sex						
Male (reference)						
Female		.045**		.028*		-.011
Education						
High school or less (reference)						
More than high school		-.055***		.026		-.012
Marital Status						
Not Married (reference)						
Married or Partnered		.003		-.002		-.013
Income (range 0-120K)		-.045**		.069***		.093***
Work						
Yes		.064***		.096***		.056***
Any diagnosis of depression, anxiety, PTSD prior to 9/11						
Yes		.002		-.034*		-.009
Number of life stressors before 9/11		.015		.014		-.01
Perceived preparedness		-.001		.052***		.01
Number of important sources of family support while working at WTC site		.043**		.059***		.018

p< .05*, .01**, .001***

Table 25. (Con't.)

Multiple Linear Regression Analyses Predicting Well-Being in WTC Responders (N=4,148)

Predictor Variables	PTGI		PANAS		QOL	
	ΔR2	Standardized β	ΔR2	Standardized β	ΔR2	Standardized β
Number of sources of work support while working at WTC site		.057***		.025		.012
WTC-related trauma exposures		.025		.060***		.032**
PCL Score		.249***		-.293***		-.479***
Diagnosed with asthma after 9/11						
Yes		-.005		-.017		-.053***
Diagnosed with GERD after 9/11						
Yes		-.002		-.054***		-.05***
Diagnosed with sinusitis after 9/11						
Yes		-.003		-.011		-.023
Number of life stressors since 9/11						
Step 2	.016***		.003**		.001	
Non-Hispanic White (reference)						
Non-Hispanic Black		.013		.016		-.019
Hispanic		.077***		.017		.008
Other		.001		-.024		-.008
Step 3	.075***		.059***		.066***	
Positive Religious Coping		.277***		.144***		.061***
Perceived Social Support		.034*		.187***		.259***
Active Coping		.071***		.082***		.054***

p< .05*, .01**, .001***

Table 26 presents frequencies of posttraumatic growth, positive affect, and quality of life among Hispanic responders. The results show that Hispanics report a mean score of 26.19 in posttraumatic growth out of a possible total score of 50 on the PTGI. They further report a mean score of 3.15 in positive affect out of a possible total mean score of 4 on the PANAS. Last, they report a mean score of 47.74 in quality of life out of a possible total score of 56 on the Q-LES-Q.

Table 26.

Mean, Median, Range of PTGI, PANAS, and QOL in Hispanic WTC Responders (N=806)

	PTGI Score	Positive Affect Score	QOL Score
Mean	26.19	3.15	47.74
Median	28	3.2	49.25
Range	50	4	56

Table 27 presents results from *t*-test analyses comparing mean scores of posttraumatic growth, positive affect, and quality of life among Hispanic responders by language preference. The findings reveal that there were significant differences in the mean scores for the three conditions. In posttraumatic growth, we find that Spanish-speaking responders (Mean=32.43, SD=11.62) report a higher mean score than responders who completed the survey in English (Mean=24.26, SD=14.48); $t(389.59)$= -7.98, $p < .001$. Conversely, Hispanic responders who completed the survey in English report higher mean scores for positive affect (Mean=3.32, SD=.79) than Spanish-speaking responders (Mean=2.58, SD=.71); $t(332.37)$=12.08, $p < .001$). Similarly, English speaking responders report a higher mean score for quality of life (Mean=50.37, SD=10.67) than those who completed the survey in Spanish (Mean=39.27, SD=11.34); $t(301.79)$=11.98, $p < .001$.

Table 27.

Descriptive Statistics of Posttraumatic Growth, Positive Affect, and Quality of Life in Hispanic WTC Responders by Language Preference (N=806)

| | English (*N*=615) | | Spanish (*N*=191) | | | | |
	Mean	SD	Mean	SD	95% CI	*t*	df
PTGI Score	24.26	14.48	32.43	11.62	-10.2 - -6.2	-7.98***	389.59
Positive Affect Score	3.32	0.79	2.58	0.71	.62-86	12.08***	332.37
QOL Score	50.37	10.67	39.27	11.34	9.27-12.92	11.98***	301.79

p< .05, .01**, .001***

Table 28 presents results from *t*-test analyses comparing mean scores of posttraumatic growth, positive affect, and quality of life among Hispanic responders by US nativity. The results presented in this table reveal that Hispanic responders who were born abroad report a higher mean score of posttraumatic growth (Mean=28.58, SD=13.88) than those who are US

experiencing positive affect. Conversely, Hispanic responders who completed the survey in

Spanish (β= -.106, *p* < .01) and report PTSD symptoms (β= -.321, *p* < .001) were less likely to

report experiencing positive affect. Similarly, Hispanic responders who reported perceived social

support (β= .216, *p* < .001), positive religious coping (β= .059, *p* < .05), and were employed (β=

.062, *p* < .05) were significantly more likely to report a higher quality of life. Further, Hispanic

responders who completed the survey in Spanish (β= -.093, *p* < .01), reported higher PTSD

symptoms (β= -.498, *p* < .001), and were diagnosed with sinusitis after 9/11 (β= -.084, *p* < .01)

were less likely to report a higher quality of life.

Table 29.

Multiple Linear Regression Analyses Predicting Well-Being in Hispanic WTC Responders (N=806)

Predictor Variables	PTGI		PANAS		QOL	
	ΔR2	Standardized β	ΔR2	Standardized β	ΔR2	Standardized β
Step 1	.109***		.356***		.560***	
Age		.066		.033		.037
Sex						
Male (reference)						
Female		.025		-.005		-.002
Education						
High school or less (reference)						
More than high school		-.051		.013		-.021
Marital Status						
Not Married (reference)						
Married or Partnered		-.04		-.028		-.032
Income (range 0-120K)		-.081		.034		.06
Work						
Yes		.072		.112***		.062*
Any diagnosis of depression, anxiety, PTSD prior to 9/11						
Yes		.042		-.047		.013
Number of life stressors before 9/11		.011		.015		.001
Perceived preparedness		.007		.025		.001
Number of important sources of family support while working at WTC site		.017		.126***		.054
Number of important sources of work support while working at WTC site		.078		-.017		.012
WTC-related trauma exposures		.053		.091**		-.038
PCL Score		.219***		-.321***		-.498***
Diagnosed with asthma after 9/11						
Yes		.011		-.063		-.019
Diagnosed with GERD after 9/11						
Yes		.02		.01		-.026
Diagnosed with sinusitis after 9/11						
Yes		-.003		-.049		-.084**
Number of life stressors since 9/11		-.058		.04		-.054
Step 2	.017***		.004*		.004**	
Born Abroad						
Spanish Survey		.139**		-.106**		-.093**
Step 3	.056***		.050***		.045***	
Positive Religious Coping		.222***		.172***		.059*
Perceived Social Support		.03		.145***		.216***
Active Coping		.097**		.039		.035

p< .05*, .01**, .001***

Moderation Effect of US Nativity and Language Preference on

Active Coping and Well-Being

In the analyses conducted the main effect of active coping predicted an increase in posttraumatic growth (B= 3.382, SE= 1.149, β= .106, *p* < .01). When the interaction term of active coping and being born in the United States was entered into the model we found that there is no significant moderation effect (B= -3.677, SE= 2.302, β= -.095, p= .111). We similarly found that the interaction term of active coping and completing the survey in English (B= -1.069, SE= 2.746, β= -.031, p= .697) did not have a moderation effect on the relationship between active coping and posttraumatic growth in Hispanics.

However, in testing the moderation effect of US nativity on the relationship between active coping and positive affect among Hispanic responders, we found that there is a significant moderation effect. Specifically, we found that while active coping did not predict an increase in positive affect (B= .06, SE= .06, β= .03, p = .277) among Hispanic responders, when the interaction term of active coping and being born in the United States was entered into the model, it yielded a significant moderation effect (B= -.23, SE= .11, β= -.099, *p* < .05), demonstrating that being born abroad had an enhancing effect on active coping such that they showed positive affect scores that were, on average, 3% higher than those who were born in the United States and used active coping (see Graph 1). Cohen's effect size value (*d*= .36) suggests a small to moderate significance.

Similarly, we found that active coping did not predict an increase in quality of life (B= .79, SE= .66, β= .03, p = .229) among Hispanic responders. However, when the interaction term of active coping and being born in the United States was entered into the model, it yielded a significant moderation effect (B= -2.698, SE= 1.312, β= -.084, *p* < .04), demonstrating that being

born abroad had an enhancing or facilitating effect on active coping such that responders who were born abroad showed quality of life scores that were, on average, 31.2% higher than those who were born in the United States and used active coping (see Graph 2). Here also the Cohen's effect size value (*d*= .45) suggests a small to moderate significance.

Graph 1: Moderation Effect of US Nativity on Positive Affect
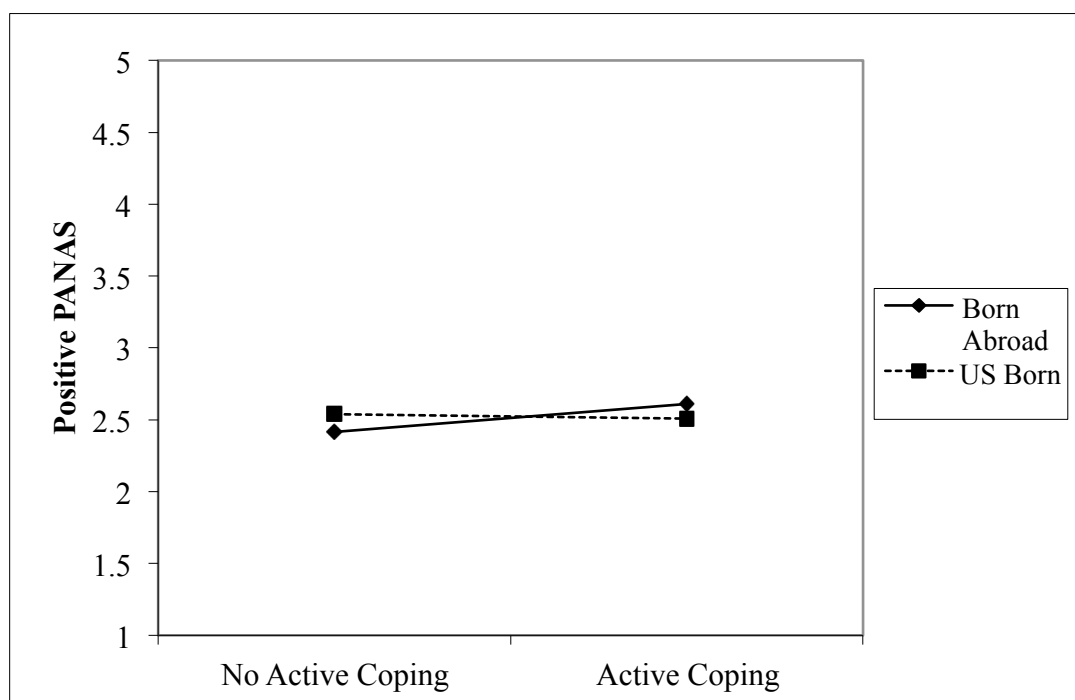
Graph 2: Moderation Effect of US Nativity on Quality of Life

Legend: Born Abroad, US Born. X-axis: No Active Coping, Active Coping. Y-axis: Quality of Life (10–100).
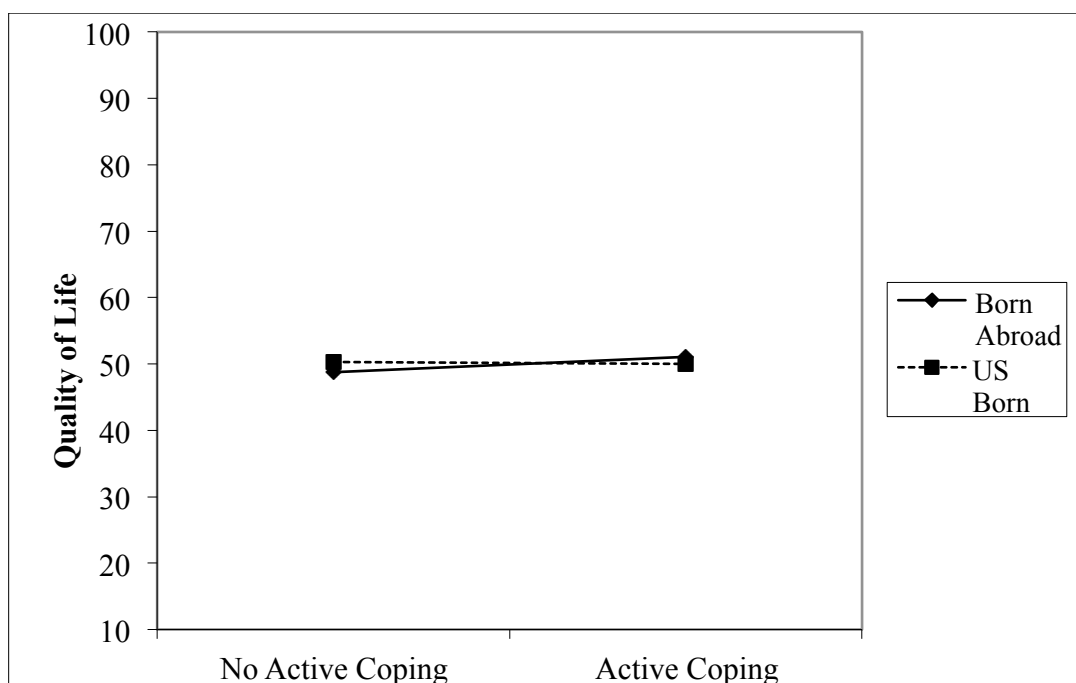
Summary

The results presented in this chapter were on the association between positive religious coping, perceived social support, and active coping to three different measures of psychological well-being, including posttraumatic growth, positive affect, and quality of life among WTC responders, while controlling for PTSD symptoms, WTC-related trauma exposure, demographics, and clinical and psychosocial characteristics. These associations were also examined among Hispanic responders by language preference and US nativity. Last, the moderation effect of language preference and US nativity on active coping and psychological well-being in Hispanic responders was tested. The results suggest that positive religious coping, perceived social support, and active coping are significantly associated with posttraumatic growth, positive affect, and quality of life among WTC responders. When examining these

associations by race/ethnicity we find that responders who self-identify as Hispanic are more likely than Non-Hispanic White responders to report posttraumatic growth. However, there were no significant differences in experiences of positive affect or quality of life among WTC responders by race/ethnicity.

Further, when examining these associations among Hispanic responders by language preference and US nativity, the findings reveal that Hispanic responders who completed the survey in Spanish, report higher PTSD symptoms, use positive religious coping and active coping are more likely to report posttraumatic growth. Furthermore, completing the survey in English, using positive religious coping, and reporting perceived social support are significantly associated with experiences of positive affect and having a higher quality of life among Hispanic responders. Moreover, when testing for the moderation effect of language preference and US nativity on the relationship between active coping and three different measures of psychological well-being among Hispanic responders, we found that the interaction term of being born abroad and active coping had a significant moderation effect on the relationship between active coping and positive affect, as well as active coping and quality of life.

In the next chapter, I present an interpretation and discussion of the study results and examine how these findings relate to existing research. I include how this research added to trauma research and our understanding of coping in WTC responders. In particular, I focus on Hispanic WTC responders. Further, the results' relevance to the WTC health program and its clinical implications are illustrated.

CHAPTER 8: DISCUSSION, LIMITATIONS, AND CONCLUSION

The results of this study extend prior studies of World Trade Center (WTC) first responders. However, different from other studies, this study presents results on potentially protective factors that support growth and well-being among first responders. This chapter interprets the study's results, examines how the study findings relate to existing research, and discusses their relevance to the WTC first responder population and the WTC health program. The focus of this discussion is on Hispanic WTC first responders. I conclude with the study's limitations and suggestions for future research.

There were some key findings that emerged from this study. These include differences and similarities in coping by race/ethnicity. The study found that there were similarities in coping between Hispanic and Non-Hispanic Black responders and differences in coping among Hispanic responders. Further, of significance was the likelihood of using adaptive coping strategies among responders who reported higher rates of perceived preparedness and the link between having a psychiatric history pre-9/11 and using maladaptive coping skills. Variation in the use of adaptive and maladaptive coping skills among Hispanic responders was also found by level of acculturation. Additionally, the findings showed that there is an association between socioeconomic status and health. Last, the prevalence of posttraumatic growth and positive affect among Hispanic responders and the moderating effect of US nativity on the Hispanic responders' experiences of positive affect and quality of life were pertinent to the focus of this study.

Coping by Race/Ethnicity

The variation in coping among responders suggested that different coping strategies might be useful in managing WTC-related symptoms in those different race/ethnicities. For example, religious coping was more common in Black and Hispanic responders than in other

groups. Further, the similarities and differences in coping among Hispanic WTC responders by language preference and US nativity suggested that acculturation might have a role in coping patterns.

Coping Among Hispanics

Nonetheless, the use of religion as a coping strategy among Hispanic responders did not differ by nativity or language preference. This suggested that coping using religion was a key coping strategy that persists among Hispanics even in later generations. The significant association between completing the survey in Spanish and being born abroad to the use of instrumental support is consistent with some of the cultural traditions of Spanish-speaking families and communities; they often cook for each other or give concrete help when someone is in need (Ayon & Naddy, 2013; Michael et al., 2008).

However, the use of instrumental support differed more strongly by language than by nativity. This suggested that beyond the cultural element, not speaking English might leave people dependent or feeling dependent on others for instrumental support. This was a finding despite many services/phone lines that have operators who speak Spanish. This is especially the case in New York and the Tri-State area. Mental health providers working with monolingual Spanish-speaking WTC responders might consider using different cognitive behavioral therapies to work on empowering these individuals and showing them how to access resources. This has the potential to help them change their perception of barriers. Further, the prevalence of substance use and humor to cope among Non-Hispanic White responders and US-born Hispanic responders suggests that they may be similar in coping because of acculturation. This finding is consistent with earlier research that suggested more acculturated Hispanics exhibit increased risk behavior and maladaptive coping styles (Abraido-Lanza et al., 2005; Escobar et al., 2000; Lara et

al., 2005).

Implications for Mental Health Providers and Scholars

Findings from this dissertation have important implications for mental health providers treating Hispanic WTC responders. The differences and similarities found here in coping among these WTC responders revealed that different coping strategies were associated with different factors of well-being. With insight into commonly used coping strategies, mental health professionals will be able to consider their engagement and treatment practices when working with WTC responders. For example, mental health providers working with Hispanic responders should contemplate the role of religion and family when working with these people. Further, when working with Hispanic responders who are of immigrant status and have minimal resources, the findings suggest they should focus on helping them with concrete needs.

One of the study's hypotheses was that Hispanic responders, as members of a collectivistic culture, would report higher rates of perceived social support than White responders did. However, the results found the contrary; Hispanic responders reported lower rates of perceived social support than Non-Hispanic White responders did. Further, Hispanic responders who completed the survey in Spanish reported significantly lower rates of perceived social support than responders who completed the survey in English. The study found lower rates of perceived social support among Hispanic responders, especially for those who completed the survey in Spanish. This may suggest an association with the collapse of social supports often experienced by immigrants (Fuertes, 2005) and in addition, may explain the higher rates of PTSD among Hispanic WTC responders.

The difficulties experienced by many Hispanics in the US may be a result of migration, discrimination, socioeconomic disadvantage, acculturation, collapse in social supports, and

learning a second language, making them a highly vulnerable population. If mental health

practitioners have better understanding of the Hispanic WTC responders lived experiences and

how they have processed the effects of 9/11 it may help them develop better strategies to support

them. Although the risks and benefits of acculturation were not assessed in this study, findings

indicated that Hispanic responders who completed the survey in English were more likely to

report coping through the use of humor than those who completed the survey in Spanish. Humor

is noted as a protective factor in the literature, which is a positive. However, they also report

substance use more often as a mode of coping. This finding is consistent with some of the debate

in the literature that speaks to the positive and negative effects of acculturation on Hispanics.

Further research will help practitioners and researchers to understand better the effects of

acculturation on coping among Hispanic WTC responders.

In this study, I found that that US nativity had a moderating effect on the relationship

between active coping and positive affect and between active coping and quality of life among

Hispanic responders. Surprisingly, moderation tests revealed that Hispanic responders who were

born abroad and used active coping experienced higher positive affect and reported a higher

quality of life than those who used active coping and were born in the US This suggests that

there may be protective effects of foreign nativity on coping, which is consistent with some of

the literature on health disparities. Again, more research will enable scholars and practitioners to

develop a better understanding of these associations.

Similar to other study findings, this study found that Hispanic responders reported higher

rates of PTSD than other responders did. Further, responders who reported higher WTC-related

trauma exposure, life stressors since 9/11, and a diagnosis of asthma, GERD, and/or sinusitis

after 9/11 were more likely to report higher PTSD symptom levels. Conversely, WTC responders

who reported higher income, were currently working, reported life stressors before 9/11, reported higher rates of perceived preparedness, higher perceived social support, and active coping were less likely to report PTSD symptoms. These findings suggest that there are cumulative burdens on WTC responders, including their WTC-related exposure, life stressors since 9/11, and chronic health conditions that are associated with them, as they continued to present with PTSD symptoms despite the several years that have passed since the attacks of 9/11.

Research on health disparities suggests that weak social networks are associated with a variety of health risks (Barr, 2010). While a little more than half of the subjects reported diagnoses of GERD (55.4%) and sinusitis (55.5%) after 9/11, the percentage of Hispanic responders who reported a diagnosis of GERD (61.8%) and sinusitis (57.8%) after 9/11 was higher. There were also significant differences among Hispanic responders by language preference and US nativity in reporting a diagnosis of GERD and/or sinusitis after 9/11. Similarly, substantial research in recent years suggests an association between socioeconomic status and health. People in upper classes, those who have a higher level of education, hold higher paying jobs, and live in comfortable neighborhoods, live longer and healthier lives than do people in lower classes (Isaacs & Schroeder, 2004). The significant differences in level of education and income among responders by race/ethnicity placed Hispanic responders at a disadvantage.

Coping and Well-Being among Hispanic WTC Responders

Despite the adversities experienced by Hispanic responders and their high risk for PTSD, the study findings revealed that their use of positive religious coping and active coping could support their posttraumatic growth. Similarly, Hispanic responders who used positive religious coping and reported higher perceived social support, report higher levels of positive emotions.

These findings suggest that we may want to consider the role of religious coping and family involvement when working with Hispanic WTC responders in mental health and/or community-based settings.

Practice and Policy Implications

The study results have practice and policy implications for understanding the unique experiences of WTC responders and in particular the experiences of Hispanic WTC responders. Some of the implications include the importance of understanding and attending to the medical and mental health effects of 9/11 on WTC responders. Further, the unique social and socioeconomic difficulties faced by Hispanic WTC responders require consideration when working with them. There may be benefits to offering WTC responders integrated health services. A collaborative approach that focuses on the whole person, is informed by evidence, and promotes the physical, psychological, and social well-being of WTC responders can help treat their WTC-related health conditions and promote their well-being. Considering the role of alternative treatments, such as the use of herbal therapies or home remedies is crucial to providing culturally relevant care. Further, Hispanic WTC responders may benefit from resources that can help mitigate the difficulties triggered by migration and their lower socioeconomic status. Offering case management and care coordination services to help program participants with their concrete needs seems relevant for this population. They may also benefit from the opportunity to develop social networks. Not only is it important for the patient to have a strong relationship with their practitioner but also for them to have healthy social supports and outlets. Moreover, it is integral that mental health providers consider the use of positive religious coping and family involvement when treating Hispanic WTC responders. However, it is important for people working with these Hispanic patients what coping strategies and sources of

support are most helpful to them. Since there are differences in their coping and associated measures of well-being, those treating Hispanic WTC responders, those working with these patients should explore the resources they have available and encourage them as a source of support.

Study Limitations and Conclusion

Although this study has begun to shed light on unique coping aspects of Hispanic WTC responders, researchers should take up this topic in more depth. While the study's findings have relevance to the mental health treatment of WTC first responders and add to existing research, this study has notable limitations. First, this study was a secondary data analysis; therefore, there were constructs examined that I did not have available to me. For example, the use of positive religious coping was a construct highly relevant to this study; however, the dataset did not include a scale that measured positive religious coping. This appears particularly important, since Hispanics appeared to rely on religion. Instead, item numbers (4) "Pray or Meditate" and (20) "Lean on my faith in God or a higher power" from the RSES were recoded to create a variable for positive religious coping. Replication with a specific measure that assesses for positive religious coping would enhance understanding of this phenomenon. The most popular scales used are the Brief RCOPE (Pargament, 1997) and the Daily Spiritual Experience Scale (DSES) (Underwood, 2011).

In addition, there are limitations in who is represented in the study population and the time during which data were collected. The study population comprised a volunteer sample of WTC responders who completed at least three visits to the WTC-HP; these were conducted an average of 3, 6, and 8 years after 9/11. It is therefore not clear whether the results would generalize to the broader WTC responder population or WTC-HP participants who did not

complete three visits to this program or who were assessed over different time intervals. This limitation requires caution when interpreting the study's findings.

On average, participants completed their first visit to the WTC-HP three years after 9/11. Consequently, retrospective recall bias for some responders may have influenced reporting of remote events such as specific WTC exposures. Further, self-report measures were used to assess all of the constructs in this study, including WTC-related PTSD symptoms. Additional research using clinician-administered structured interviews would either confirm these results or challenge the findings I presented here. Similarly, the generalizability of the study findings is questionable. Hispanics who respond to other disasters may have similar responses. However, given the uniqueness of the attacks of 9/11 on the WTC and the associated health and mental health effects of this event, it may be these findings are specific to this particular event. Replication with other Hispanic disaster responder populations would add greatly to our understanding of how best to serve their needs.

Last, the current study did not differentiate between police responders and non-traditional responders. Research has repeatedly shown that the level of preparedness may mitigate risk for PTSD in first responders (Alexander, 1993; Alexander & Wells, 1991; Goldman et al., 2012; Johnson et al., 2005; Renshaw, 2011). Given the differences in training between police and non-traditional responders, additional research could compare differences in coping and psychological well-being between police and non-traditional responders.

Despite these limitations, this is the first study to examine coping in WTC responders by ethnicity, focusing on Hispanic responders. These finding begin to suggest recommendations for future disaster preparedness, monitoring and treatment, including the impact of supportive coping strategies associated with different psychosocial factors of well-being. Further studies

should focus on interventions targeting potentially modifiable factors in WTC and other disaster

responder populations.

APPENDIX A: LETTER TO HUNTER IRB

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January 7, 2013

CUNY UI-IRB

To Whom It May Concern:

I am the Principal Investigator (PI) on a NIOSH/CDC grant funded project that has been approved by the Mount Sinai School of Medicine Internal Review Board (IRB). The study, currently starting the second of three years, is designed to examine the trajectories of psychological risk and resilience in World Trade Center (WTC) responders coming for periodic monitoring to the WTC Health Program at Mount Sinai Medical Center and other consortium clinics. The study also includes administration of a Web-based survey focusing on resilience to a subset of responders coming to the Mt Sinai WTC Health Program. I am writing this letter in support of Dianne Ciro's IRB application to the CUNY UI-IRB and to confirm that I have granted her access to our datasets, which has been de-identified, for her to use in a separate research study, which is an extension of our ongoing research study. To clarify, the de-identified datasets that Ms. Ciro now has access to consist of (1) data collected by the Data Center at the WTC Health Program (Mt. Sinai Medical Center) and (2) data collected via our Web-based survey for our NIOSH/CDC-funded project, also conducted at Mt. Sinai.

Please feel free to contact me at 212-659-9145 if you have any questions.

Sincerely,

Adriana Feder, MD

APPENDIX B: TRAJECTORIES WEB-BASED SURVEY
Please answer the following questions to the best of your ability. All answers are confidential and only the research staff will have access to your responses.

Q.1 Are you currently working full time?

       Yes

       No

a. If "Yes", what is your current job title? _____

b. If "No", what best describes your current work status:

       Working part-time

       Disabled or on medical leave from a WTC-related health problem

       Disabled or on medical leave from a non-WTC related health problem

       Unemployed or laid off

       Retired

       Student

       Other (Please specify:_____)

Q.2 Are you (Check only **ONE**):

Single	Married
Single but involved in a relationship	Separated
Single living with a partner	Divorced
Widowed	

Q.3 What race/ethnicity do you regard yourself? (Check **ALL** that apply):

       African American/Black (Any known African or African American ancestry)

       Asian (Chinese, East Indian, Japanese, Korean, Filipino, or Vietnamese ancestry)

       Hispanic/Latino

       Native American/American Indian

       White/Caucasian

       Other (Please specify:_____)

   If you checked "Hispanic/Latino", please complete Q.3a below. If not, please go to Q.4.

    Q.3a Were you born in the United States mainland?

       Yes (Please specify what country/countries your family came from: _____)

       No (Please specify in what country you were born: _____)

Q.4 In addition to coverage by the WTC Medical Monitoring and Treatment Program services, do you have any of the following health insurance? (Check **ALL** that apply):

       HMO (Specify:_____)

       PPO (Specify:_____)

       Private insurance

       Medicare

       Medical Assistance or Medicaid

       No insurance

       Other (Specify:_____)

Q.5 Because income level is associated with the occurrence and severity of certain medical conditions as well as access to health care, we would like to ask what was your annual individual income last year? (Check only **ONE**):

$0-10,000	$80,001-90,000
$10,001-20,000	$90,001-100,000
$20,001-30,000	$100,001-110,000
$30,001-40,000	$110,001-120,000
$40,001-50,000	$120,001-130,000
$50,001-60,000	$130,001-140,000
$60,001-70,000	$140,001- or above
$70,000-80,000	Don't wish to answer

Q.6 This scale consists of a number of words that describe different feelings and emotions. Read each item and then **circle the description** that best fits you. Indicate to what extent you **generally feel this way, that is, how you feel on average**.

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
1. Interested	1	2	3	4	5
2. Distressed	1	2	3	4	5
3. Excited	1	2	3	4	5
4. Upset	1	2	3	4	5
5. Strong	1	2	3	4	5
6. Guilty	1	2	3	4	5
7. Scared	1	2	3	4	5
8. Hostile	1	2	3	4	5
9. Enthusiastic	1	2	3	4	5
10. Proud	1	2	3	4	5
11. Irritable	1	2	3	4	5
12. Alert	1	2	3	4	5
13. Ashamed	1	2	3	4	5
14. Inspired	1	2	3	4	5
15. Nervous	1	2	3	4	5
16. Determined	1	2	3	4	5
17. Attentive	1	2	3	4	5
18. Jittery	1	2	3	4	5
19. Active	1	2	3	4	5
20. Afraid	1	2	3	4	5

Q.7 The following statements describe how some individuals may think, feel, or act during and after the most stressful events in life. Please **circle the answer** that describes how well each of these statements describes you **during and after** life's most stressful events.

	Exactly like me (4)	(3)	(2)	(1)	Not at all like me (0)
1. Take action to fix things	4	3	2	1	0
2. Not give up trying to do what's necessary to carry on	4	3	2	1	0
3. Find a way to do what's necessary to carry on	4	3	2	1	0
4. Pray or meditate	4	3	2	1	0
5. Face my fears	4	3	2	1	0
6. Find opportunity for growth	4	3	2	1	0
7. Calm and comfort myself	4	3	2	1	0
8. Try to "recharge" myself before I have to face the next challenge	4	3	2	1	0
9. See it as a challenge that will make me better	4	3	2	1	0
10. Look at the problem in a number of ways	4	3	2	1	0
11. Look for creative solutions to the problem	4	3	2	1	0
12. Put things in perspective and realize I will have times of joy and times of sadness	4	3	2	1	0
13. Be good at determining what situations are changeable and which ones are not	4	3	2	1	0
14. Find meaning from the experience	4	3	2	1	0
15. Find strength in the meaning, purpose, or mission of my life	4	3	2	1	0
16. Know I will bounce back	4	3	2	1	0
17. Expect that I can handle it	4	3	2	1	0
18. Learn important and useful life-lessons	4	3	2	1	0
19. Understand that bad things can happen to anyone, not just me	4	3	2	1	0
20. Lean on my faith in God or a higher power	4	3	2	1	0
21. Draw upon lessons learned from failures and past mistakes	4	3	2	1	0
22. Practice ways to handle it better next time	4	3	2	1	0
23. Reach out to family and/or friends for support	4	3	2	1	0

Q.8 For each of the following statements, **circle the number** that would be most nearly true for you. The numbers extend from one extreme feeling to the opposite on the other side:

1. In life, I have:

No goals or desires						Very clear goals and desires
1	2	3	4	5	6	7

2. My personal existence is:

Meaningless, without purpose						Purposeful, meaningful
1	2	3	4	5	6	7

3. In achieving goals, I have:

Made no progress						Progressed to complete fulfillment
1	2	3	4	5	6	7

4. I have discovered:

No purpose or meaning in life						Clear-cut goals and a purpose in life
1	2	3	4	5	6	7

Q.9 The events below may or may not have happened to you in your lifetime. Please **select "YES" if that event has happened to you or "NO" if that event has never happened to you** and indicate whether the event occurred "Before 9/11/01" and/or "After 9/11/01".

	Before 9/11/01		After 9/11/01	
1. Life-threatening illness or injury (please describe:_____)	NO	YES	NO	YES
2. A really bad car, boat, train, or airplane accident	NO	YES	NO	YES
3. A really bad accident at work or home	NO	YES	NO	YES
4. A hurricane, flood, earthquake, tornado, or fire	NO	YES	NO	YES
5. Hit or kicked hard enough to injure - as a child	NO	YES		
6. Hit or kicked hard enough to injure - as an adult	NO	YES	NO	YES
7. Forced or made to have sexual contact - as a child	NO	YES		
8. Forced or made to have sexual contact - as an adult	NO	YES	NO	YES
9. Attacked with a gun, knife, or weapon	NO	YES	NO	YES
10. During military service - saw something horrible or was badly scared	NO	YES	NO	YES
11. Sudden death of close family member or friend	NO	YES	NO	YES
12. Seeing someone die suddenly or get badly hurt or killed	NO	YES	NO	YES
13. Sudden move or loss of home and possessions	NO	YES	NO	YES
14. Suddenly abandoned by spouse, partner, parent, or family	NO	YES	NO	YES

| 15. Some other sudden event that made you feel very scared, helpless, or horrified (please describe:_____) | NO | YES | NO | YES |

Q.10 **PRIOR TO 9/11/2001**, did you ever take part in **any rescue and recovery efforts** a͡   ͘͘ or a disaster?

Yes

No

[If "No", skip to Question 11. If "Yes", answer questions 10a and 10b]

10a. **PRIOR TO 9/11/2001,** on how many different occasions did you take part in rescue and recovery efforts after an accident or disaster? (Check only **ONE**):

1   2   3   4   5 (or more)

10b.Please specify the type of accident(s) or disaster(s) **PRIOR TO 9/11/2001** (Check **ALL** that apply):

Natural (e.g., flood, earthquake, tornado, hurricane)

Man-made (e.g., bombing, terrorism)

Fire, explosions

Transportation accident (e.g., car accident, boat accident, train wreck, planecrash)

Exposure to toxic substance (e.g., dangerous chemicals or radiation)

Scene of assault with a weapon (e.g., shooting, stabbing)

Other (Specify:_____)

Q.11 **PRIOR TO 9/11/2001**, did you ever take part in any of the following, intended to prepare you to participate in rescue and recovery efforts after an accident or a disaster?

1.   Attended one or more classes or sessions to prepare me for rescue and recovery efforts

Yes

No

2.   Participated in one or more simulation exercises or drills to prepare me for rescue and   recovery efforts

Yes

No

Q.12 Below are statements of how well prepared you were for your **9/11-RELATED** rescue and recovery efforts. Please **circle the response** that describes you best:

1. My work and activities before 9/11 provided me with helpful training to perform my 9/11-related recovery work	YES	NO
2. On site, I was adequately informed about the role I was expected to play	YES	NO
3. When I was performing my 9/11-related work, I had a good idea of how long my work would take to complete	YES	NO
4. I was adequately trained to perform the tasks required of me during the recovery efforts	YES	NO

Q.13 Looking back now, what, if anything, would have prepared you better <u>before</u> your WTC experience? (**Write your response** below):

_____

_____

Q.13b. What, if anything, would have prepared you better <u>while</u> you were working at the WTC site? (**Write your response** below):

_____

_____

Q.14a. Looking back now, what services do you think would have been helpful for workers <u>while</u> working at the WTC site? (**Write your response** below):

_____

_____

Q.14b. What services do you think would have been helpful for workers <u>since</u> working at the WTC site? (**Write your response** below):

Q.15 Indicate for each of the statements below the degree to which this change occurred in your life **as a result of your WTC experience**. Please **circle the answer** that describes you best.

	I did not experience this change as a result of my WTC experience.	I experienced this change to a very small degree as a result of my WTC experience.	I experienced this change to a small degree as a result of my WTC experience.	I experienced this change to a moderate degree as a result of my WTC experience.	I experienced this change to a great degree as a result of my WTC experience.	I experienced this change to a very great degree as a result of my WTC experience.
1. I have changed my priorities about what is important in life	0	1	2	3	4	5
2. I have a greater appreciation for the value of my own life	0	1	2	3	4	5
3. I am able to do better things with my life	0	1	2	3	4	5

4. I have a better understanding of spiritual matters	0	1	2	3	4	5
5. I have a greater sense of closeness with others	0	1	2	3	4	5
6. I established a new path for my life	0	1	2	3	4	5
7. I know better that I can handle difficulties	0	1	2	3	4	5
8. I have a stronger religious faith	0	1	2	3	4	5
9. I discovered that I'm stronger than I thought I was	0	1	2	3	4	5
10. I learned a great deal about how wonderful people are	0	1	2	3	4	5

Q.16 The next statements refer to events you may have experienced **SINCE 9/11/2001**. Please **circle the answer** that describes you best:

SINCE 9/11/01, I have…

1.	Lost my job	NO	YES
2.	Gone through a divorce or been left by a partner or significant other	NO	YES
3.	Had problems getting access to adequate healthcare	NO	YES

Q.17 Below is a list of problems you may have experienced **IN RELATION TO 9/11/2001**. Please read each problem carefully and **circle one of the numbers** to the right to indicate how much you have been bothered by that problem **IN THE PAST MONTH**.

	Not at all	A little bit	Moderately	Quite a bit	Extremely
1. Repeated, disturbing *memories, thoughts,* or *images* of the disaster?	1	2	3	4	5
2. Repeated, disturbing *dreams* of the disaster?	1	2	3	4	5
3. Suddenly *acting* or *feeling* as if the disaster *were happening again* (as if you were reliving it)?	1	2	3	4	5
4. Feeling *very upset* when *something reminded* you of the disaster?	1	2	3	4	5
5. Having *physical reactions* (e.g., heart pounding, trouble breathing, or sweating) when *something reminded* you of the disaster?	1	2	3	4	5
6. Avoid *thinking about* or *talking about* the disaster or avoid *having feelings* related to it?	1	2	3	4	5
7. Avoid *activities* or *situations* because *they remind you* of the disaster?	1	2	3	4	5
8. Trouble *remembering important parts* of the disaster?	1	2	3	4	5
9. Loss of *interest in things that you used to enjoy*?	1	2	3	4	5
10. Feeling *distant* or *cut off* from other people?	1	2	3	4	5
11. Feeling *emotionally numb* or being unable to have loving feelings for those close to you?	1	2	3	4	5
12. Feeling as if your *future* will somehow be *cut short*?	1	2	3	4	5
13. Trouble *falling* or *staying asleep*?	1	2	3	4	5
14. Feeling *irritable* or having *angry outbursts*?	1	2	3	4	5

15. Having *difficulty concentrating*?	1	2	3	4	5
16. Being *"super alert"* or watchful on guard?	1	2	3	4	5
17. Feeling *jumpy* or easily startled?	1	2	3	4	5

Q.18 Please **select THREE** coping strategies below that you have used most commonly to help you cope **SINCE 9/11/01**?

Self-distraction (e.g., turn to work or other activities to take my mind off things)
Active coping (e.g., take action to make the situation better)
Denial (e.g., refuse to believe that it happened)
Substance use (e.g., use alcohol or drugs to help get through it)
Use emotional support (e.g., get comfort and understanding from others)
Use instrumental support (e.g., get advice from others)
Behavioral disengagement (e.g., give up in trying to deal with it)
Venting (e.g., express negative feelings)
Positive reframing (e.g., look for something positive in what happened)
Planning (e.g., come up with a strategy for what to do)
Humor (e.g., try to find humor in the situation)
Acceptance (e.g., accept the reality that it happened)
Religion (e.g., pray, meditate, or find comfort in spiritual beliefs)
Self-blame (e.g., blame or criticize myself for what happened)
Other: _____

Q.19 Please describe what has been the most useful in helping you cope with 9/11/2001? (**Write your response** below):
_____
_____
_____
_____
_____
_____

Q.20 **IN THE LAST MONTH**, to what extent have emotional problems disrupted your:

	Not at all	Mildly		Moderately		Markedly			Extremely
Work? I am not currently working	0	1	2	3	4	5	6	7	8	9	10
Social Life?	0	1	2	3	4	5	6	7	8	9	10
Family Life/ Home Responsibilities?	0	1	2	3	4	5	6	7	8	9	10

Q.21 Over the **LAST 2 WEEKS**, how often have you been bothered by any of the following problems?

	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3

Q.22 We would like to know about your alcohol use:

Do you drink alcohol?

        Yes

        No

[If you answered "No", skip to Question 23. If "Yes" you do drink alcohol, please answer the following questions (1-4)]

1. Have you felt you should cut down on your drinking?	YES	NO
2. Have people annoyed you by criticizing your drinking?	YES	NO
3. Have you felt bad or guilty about your drinking?	YES	NO
4. Have you had a drink first thing in the morning to steady your nerves or to get rid of a hangover (had an "eye-opener")?	YES	NO

Q.23 What are your thoughts about 9/11/01? Please **circle the response** that describes you best:

	Not at all	A little	Somewhat	Quite a bit	Very much
1. Do you feel that your health has been adversely affected by 9/11?	1	2	3	4	5
2. Are you concerned about the possibility that you have or will get a 9/11-related illness?	1	2	3	4	5
3. Are you more worried about your health than other people your age who were not 9/11 responders?	1	2	3	4	5
4. **DO YOU TRUST THE INFORMATION IN THE MEDIA ABOUT THE HEALTH CONSEQUENCES OF 9/11?**	1	2	3	4	5
5. Do you think that medical scientists understand the health risks from 9/11?	1	2	3	4	5
6. Do you feel that the health risks from 9/11 are well understood by the medical staff at the WTC clinic?	1	2	3	4	5
7. Do you trust 9/11 health information from state and federal officials?	1	2	3	4	5
8. Are you concerned that 9/11 health	1	2	3	4	5

risks will be passed down to future generations?					
9. On a typical day, do you give much thought to 9/11?	1	2	3	4	5
10. On a typical day, do you talk about the effects of 9/11 with family and friends?	1	2	3	4	5

Q.24 Please answer the following questions by **circling the response** that fits you best:

	Never	Almost never	Sometimes	Fairly often	Very often
1. Since 9/11, how often have you felt that you were unable to control the important things in your life?	0	1	2	3	4
2. Since 9/11, how often have you felt confident about your ability to handle your personal problems?	0	1	2	3	4
3. Since 9/11, how often have you felt that things were going your way?	0	1	2	3	4
4. Since 9/11, how often have you felt difficulties were piling up so high that you could not overcome them?	0	1	2	3	4

Q.25 Has a doctor or health care professional ever diagnosed you with any of the following conditions? Please **select "YES" or "NO" if you have ever been diagnosed with the condition.** Please indicate whether the condition was diagnosed "Before 9/11/01" and/or "After 9/11/01".

	Before 9/11/01		After 9/11/01	
1. Diabetes	No	Yes	No	Yes
2. High blood pressure	NO	YES	NO	YES
3. Arthritis	NO	YES	NO	YES
4. Asthma or chronic respiratory condition	NO	YES	NO	YES
5. Cancer: (Type:_____)	NO	YES	NO	YES
6. Chronic rhinitis or sinusitis	NO	YES	NO	YES
7. Chronic pain (e.g., low back pain, neck pain or fibromyalgia)	NO	YES	NO	YES
8. Sleep apnea	NO	YES	NO	YES
9. Alcohol or substance use disorder	NO	YES	NO	YES
10. GERD or acid reflux	NO	YES	NO	YES
11. Heart disease	NO	YES	NO	YES
12. High cholesterol	NO	YES	NO	YES
13. Anxiety or panic disorder	NO	YES	NO	YES
14. Kidney disease	NO	YES	NO	YES

15. Liver disease	NO	YES	NO	YES
16. Migraine	NO	YES	NO	YES
17. Osteoporosis or osteopenia	NO	YES	NO	YES
18. Rheumatoid arthritis	NO	YES	NO	YES
19. Depression	NO	YES	NO	YES
20. Stroke	NO	YES	NO	YES
21. Traumatic brain injury	NO	YES	NO	YES

Q.26 How often has each of the following kinds of support been available to you **SINCE 9/11/2001?**
Please **circle the response** that describes you best:

	None of the time	A little of the time	Some of the time	Most of the time	All of the time
1. Someone to confide in or talk to about your problems	1	2	3	4	5
2. Someone to get together with for relaxation	1	2	3	4	5
3. Someone to help you with daily chores if you were sick	1	2	3	4	5
4. Someone to turn to for suggestions on dealing with personal problems	1	2	3	4	5
5. Someone to love and make you feel wanted	1	2	3	4	5

Q.27 **SINCE 9/11/2001**, have you ever received mental health treatment (e.g., prescription medication or psychotherapy for a psychiatric or emotional problem)?

Yes

No

[If you answered "No", skip to Question 33. If you answered "Yes", please answer questions 26-32].

Q.28 What kinds of services did you receive? (Check **ALL** that apply):

One-to-one psychotherapy or counseling.

Alcohol abuse counseling/treatment.

Medication for emotional problems, nerves, or sleep.

Marriage and family counseling.

Religious/spiritual counseling.

Stress management counseling.

Peer support groups or group psychotherapy.

Family support counseling.

Q.29 Are you currently taking prescription medication for a psychiatric or emotional problem?

Yes

No

Q.30 Did you ever **stop** taking medication for a psychiatric or emotional problem **earlier than** recommended?

       Yes (Please specify reason:_____)

       No

Q.31 Are you currently receiving psychotherapy or counseling for a psychiatric or emotional problem?

       Yes

       No

Q.32 Did you ever **stop** going for counseling **earlier than** recommended?

       Yes (Please specify reason:_____)

       No

Q.33 Taking everything into consideration, **DURING THE PAST MONTH**, how satisfied have you been with your (Please **circle the answer** that describes you best):

	OVERALL LEVEL OF SATISFACTION				
	Very Poor	**Poor**	**Fair**	**Good**	**Very Good**
1. Physical health?	1	2	3	4	5
2. Mood?	1	2	3	4	5
3. Work?	1	2	3	4	5
4. Household activities?	1	2	3	4	5
5. Social relationships?	1	2	3	4	5
6. Family relationships?	1	2	3	4	5
7. Leisure time activities?	1	2	3	4	5
8. Ability to function in daily life?	1	2	3	4	5
9. Sexual drive, interest and/or performance?	1	2	3	4	5
10. Economic status?	1	2	3	4	5
11. Living/housing situation?	1	2	3	4	5
12. Ability to get around physically without feeling dizzy or unsteady or falling?	1	2	3	4	5
13. Your vision in terms of ability to do work or hobbies?	1	2	3	4	5
14. Overall sense of well-being?	1	2	3	4	5
15. Medication? (If not taking any, check here____ and leave item blank)	1	2	3	4	5
16. How would you rate your overall life satisfaction and contentment during the past month?	1	2	3	4	5

Q.34 We are interested in understanding how working at the WTC site has affected your life.

What was the worst outcome of your WTC experience? (**<u>Write your response</u>** below):

_____
_____
_____
_____
_____
_____

Q.35 What good, if anything, came out of your WTC experience? (**<u>Write your response</u>** below):

_____
_____
_____
_____
_____
_____

Q.36 **What happened to you as a result of Hurricane Sandy and its aftermath?**

	Not at all	A little bit	Moderately	Quite a bit	Extremely	Does not apply
1. How much damage occurred in the area around where you lived?	1	2	3	4	5	8
2. How much damage occurred to your home?	1	2	3	4	5	8
3. How much damage occurred to possessions (e.g., car, boat)?	1	2	3	4	5	8
4. How much did you fear for your safety or your family's safety?	1	2	3	4	5	8
5. Did you feel a loss of control or a sense of helplessness?	1	2	3	4	5	8
6. Did you experience financial hardships?	1	2	3	4	5	8
7. Did your 9/11 experiences help you cope with the storm?	1	2	3	4	5	8
8. How much was your life disrupted by Hurricane Sandy?	1	2	3	4	5	8
9. How much did you worry about finding gasoline?	1	2	3	4	5	8
10. How much did you worry about having enough food and water?	1	2	3	4	5	8
11. How much do you blame government officials for the aftermath?	1	2	3	4	5	8
12. How much do you blame your utility company for the aftermath?	1	2	3	4	5	8

	0 days	1-3 days	4-6 days	7-14 days	2+ weeks	
13. How long were you without power?	1	2	3	4	5	
14. How long were you without your medications?	1	2	3	4	5	

	Yes	No
15. Did you use a generator?	1	2
16. Did you take family or friends into your home?	1	2
17. Were you injured?	1	2
18. Were relatives, friends or co-workers injured or harmed?	1	2
19. Were your pets injured, harmed, or lost?	1	2
20. Were you victimized or was your home robbed?	1	2
21. Did you apply to FEMA, another government program, or the Red Cross for aid?	1	2
22. Did you evacuate? *If no, skip to item 24.*	1	2

23. If you evacuated: a. Where did you go?   ____ shelter   ____ hotel   ____ friend/family

  b. How long were you there? ____ 1-2 days ____ 3-5 days ____ 5-7 days ___ more

  than a week

24. When you think about 9/11 and Hurricane Sandy, which event had the worse effect on your life? (Circle one answer)
    1. the storm was worse
    2. 9/11 was worse
    3. they affected my life about equally
    4. other events affected my life more than they did

25. Did you participate in any formal or informal rescue, recovery or clean-up efforts?

  ____ Yes → *Go to question 26*   ____ No → *Go to question 29*

26. If yes: ____ Paid work/job _____ Volunteer _____ Both (work and volunteer)

27. If yes, what did you do?

  _____

28. How many hours in total did you spend on these efforts? _____

29. Comments (optional):

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