# SEPTEMBER 11TH, 2001: ACUTE STRESS AND COPING IN A NEW YORK CITY METROPOLITAN COLLEGE SAMPLE

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To my Mother, Father
&
“Sunshine”

In Memory of

“Storm”

James and Robert

Jonathan K. Shepherd and Edward Chronicle

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ABSTRACT

The events of September 11th 2001 (9/11) provided a unique opportunity to investigate the psychological effects of terrorism in the United States. Although terrorist attacks occurred in the United States previously, the events of 9/11 marked the most devastating terrorist attack in recent U.S. History. Numerous studies have investigated the effects of 9/11 events in populations that were either directly or indirectly exposed. Despite numerous investigations, my literature review yielded only two studies examining the psychological effects of these events within the first month after the 9/11 attacks (Schuster et al., 2001; Silver, Holman, McIntosh, Poulin, & Gil-Riva, 2002). In this study, using an archived data set, some of the immediate psychological effects of 9/11 in a New York City metropolitan college sample ($n$ = 99) were investigated 10-30 days after the attacks using a self-report survey. The survey included demographic questions, physical and social proximities to the attacks, trauma symptoms as measured by the Impact of Events Scale (IES; Horowitz, Wilmer, & Alavarez, 1979), the Posttraumatic Check List (PCL; Weathers, Litz, Herman, Huska & Keane, 1993), and stressful information coping strategies (i.e., Monitoring and Blunting) using the Miller Behavioral Style Scale (MBSS; Miller, 1987). First, missing data were analyzed to determine if data were missing completely at random using "Little" Missing Completely at Random (LMCAR). After no significant differences were found using LMCAR, Expectation-Maximum algorithm was used to calculate single imputation. Eight multiple regression analyses were conducted to determine if six predictors per regression (e.g., age, gender, physical proximity, social proximity, or media [live or multiple replay]) predicted acute stress reactions as measured by the IES and PCL as continuous variables.

Moderation effects were also investigated (i.e., gender, race, Monitoring and Blunting coping strategies). Third, cutoff scores were determined for the IES and PCL to calculate what percentage of the sample met or scored higher than cutoff scores recommended by the instrument developers and prior research. Finally, a secondary analysis was performed using the Diagnostic Statistical Manual, Fourth Edition Text Revision (DSM-IV-TR) to determine if individuals meeting cutoff criteria on the PCL also met the non-temporal criteria B, C, and D for PTSD-like (subclinical) symptoms (American Psychiatric Association, 1987). Demographic, proximity and media exposure results are discussed. The IES, MBSS and PCL demonstrated adequate reliabilities. Factor analysis using maximum likelihood with Promax indicated a one-factor solution for the PCL and a two-factor solution for the IES. For the IES regressions, Monitoring coping style was consistently a significant predictor of higher IES scores. Younger age was also a significant predictor in one regression using the IES as the dependent variable. For the PCL, white-Hispanic was a significant predictor in three of four regressions using the PCL as a dependent variable. No other main effects or interactions were found. For the IES, using a cutoff score of 35, 26.3% of the sample scored a 35 or higher. For the PCL, using a cutoff score of 44, 32 (32.3%) scored 44 or higher. When using DSM-IV-TR criteria B, C and D and a cutoff score of 44 or higher, 27 (27.3%) achieved both. Conclusion: Based on prior research, this sample scored high on two widely used stress measurements. Consistent with prior PTSD terror research, Hispanic ethnicity (Neria, DiGrande, & Adams, 2011) and using a Monitoring coping style (Keinan, Sadeh, & Rosen, 2003) appeared to increase risk for higher scores on the IES and PCL. The results and implications are discussed.

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# CHAPTER 1. INTRODUCTION

The events of September 11th 2001 (9/11) have provided a unique opportunity to investigate the psychological effects of terrorism in the United States. Although terrorism occurred in the United States prior to 9/11, the devastation associated with 9/11 is unsurpassed in recent years. The Oklahoma City bombing that occurred on April 19th 1995 is the closest comparison. Some studies investigated the psychological effects of the Oklahoma City bombing among those who were directly affected and potentially indirectly affected in the surrounding communities (e.g., North, 2001). Since 9/11, numerous studies have investigated the effects of the attacks that day in populations directly exposed and in populations indirectly exposed, such as through the media. Investigations have included those affected in New York, Virginia, as well as across the United States (e.g., Silver et al., 2002). Despite numerous investigations of the effects of 9/11, only two studies were found that assessed the psychological effects of these events within the first month after the attacks (Schuster et al., 2001, Silver et al. 2002).

The purpose of this study was to investigate some of the immediate psychological effects of 9/11 among a sample of New York City metropolitan college students, faculty and staff at Mercy College during the first month following 9/11. I begin by reviewing the immediate and secondary events of 9/11, terrorism, trauma, posttraumatic stress disorder (PTSD), acute stress disorder (ASD), and PTSD epidemiology. Measurements used in the current study include demographic questions, physical and social proximity to the attacks, 9/11 media exposure, trauma symptoms as measured by the Impact of Events Scale (IES; Horowitz et al., 1979), PTSD-like (subclinical) symptoms as measured by the Posttraumatic Check List (PCL; Weathers et al., 1993), and stress coping strategies as measured by the Miller Behavioral Style Scale (MBSS; Miller, 1987).

## The Events of September 11, 2001

On September 11th 2001 (9/11), the United States of America experienced the largest and deadliest terrorist attack in U.S. history (Franz, Glass, Arnkoff, & Dutton, 2009; Lengua, Long, & Meltzoff, 2006). The extremist Islamic group Al-Qaida allegedly hijacked four American commercial passenger airplanes. The first airplane, American

Airlines (AA) flight 11, left Boston Logan airport at 7:59 A.M and by 8:21 A.M., flight attendants onboard notified the Federal Aviation Administration (FAA) that the plane had been hijacked. It crashed into the North World Trade Center (WTC) Tower at 8:46 A.M. United Airlines (UA) flight 175 left Boston Logan airport at 8:14 A.M. It crashed into the South WTC Tower at 9:03 A.M. AA flight 77 left Dulles International Airport at 8:20 A.M. It crashed into the western side of the Pentagon at 9:38 A.M. UA flight 93 departed Newark Airport at 8:42 A.M. and it crashed at 10:03 A.M. in a southern field in Pennsylvania. At 9:59 A.M., the South WTC Tower collapsed followed by the North WTC Tower at 10:28 A.M and the seven WTC building at 5:20 P.M. (Griffin, 2004). It is estimated that three thousand people lost their lives that day (Otto, Henin, Hirshfeld-Becker, Pollack, Biederman, & Rosenbaum; 2007), most of them civilians (Stone, 2002).

The catastrophic events of 9/11 were extensively televised across the nation and the world. Media outlets broadcasted many of the events as they were happening "live" in addition to broadcasting many replays for weeks and even months. The broadcasts that occurred on 9/11 televised the already hit North WTC twin tower by AA flight 11, UA flight 175 hitting the South WTC twin tower, people jumping to their deaths, the large smoke plumes from the burning towers (which were visible across the region), the damage to the Pentagon, and the collapse of the WTC twin towers and the WTC building Seven (Baschnagel, Gudmundsdottir, Hawk, & Beck, 2009; Lengua, Long, & Meltzoff, 2006; Perlman et al., 2001; Silver, Holman, McIntosh, Poulin, & Gil-Riva, 2002). The World Trade Center twin towers were once the tallest buildings in the world ("One World Trade Center," n.d.) and they were highly representational of the United States' strength in many ways – economic, political, and "untouchable" (Silver, 2011).

*Immediate Impact*

September 11th has been referred to as the "New Pearl Harbor" (Griffin, 2004) and the famous quote by Franklin Delano Roosevelt, "a day that will live in infamy," seems to apply. The 9/11 attacks marked a new era in the United States and worldwide. The immediate events of 9/11 caused the enactment of Security Control of Air Traffic and Air Navigation Aids (SCATANA) restricting the use of airspace for commercial air travel in the United States and Canada through September 13th, 2001; Wall Street remained closed until September 17th and when it reopened, the Dow Jones had to date

the largest one day loss of 7.1 percent; bridges into Manhattan were closed; many events were canceled or postponed; and several landmarks and buildings were evacuated and closed ("September 11 Attacks," 2012; "Closings and cancellations following the September 11 attacks," 2012).

*The War on Terror*

The 9/11 terrorists' attack also resulted in many U.S. domestic and foreign policy changes (Huddy & Feldman, 2011; Morgan, Wisneski, & Skitka, 2011). U.S.-led wars emerged leading to a ten-year war in Iraq and an ongoing war in Afghanistan. In an attempt to recover, rebuild and fight the "War on Terror," the U.S. has spent trillions of dollars. The costs associated with 9/11 (concurrently occurring with a domestic and world financial crisis) have reached a catastrophic level that is historically unsurpassed (Chomsky, 2011).

In the immediate aftermath of 9/11 there was strong support from international communities. Many countries held special events to show their strong solidarity with the U.S., including unanimous support from the United Nations (UN Security Act 1368). This support faded with the increasing strong retaliation by the United States with respect to the "War on Terror," not seeking peaceful resolutions, defying the U.N., and breaking the Geneva Convention (Chomsky, 2003).

Terrorism is an attempt to do long range harm to a society by instilling fear (terror) that results in psychological, social, political, and economic consequences (Silver, 2011; Silver & Mathew 2008). Since 9/11, Americans have seen drastic changes in all these domains. Americans were traumatized, civil liberties have been compromised (e.g., the U.S. Patriot Act) (Huddy & Feldman, 2011; Huddy, Khatib, & Capelos, 2002; Morgan et al., 2011; Whitehead & Aden, 2002), xenophobia has become common (Lancet, 2011; Morgan et al., 2011), political ideology has become polarized (Huddy & Feldman, 2011; Lancet, 2011; Morgan et al., 2011) economic hardship has ensued (Huddy & Feldman, 2011; Lancet, 2011) and a lot of these ramifications are still present or are still being incurred (Eisenberg & Silver, 2011; Silver, 2011; Silver et al., 2002; Silver & Mathew, 2008; Stephenson, 2001).

## Terrorism and Trauma in the United States

The events of 9/11 are different than most other types of disasters or traumatic events commonly studied in the United States. This is in part because the events were a human-made act of terror and traumatic effects were observed in people not directly exposed (Galea & Resnick, 2005; Galea, Nandi, & Vlahov, 2005; Galea et al., 2003; Huddy & Feldman, 2011; Schlenger et al., 2002; Stein et al., 2004). Some studies have looked at the effects of 9/11 media exposure on various stress measures in populations considered not directly affected by the events (Ahern et al. 2002; Ahern, Galea, Resnick, & Vlahov, 2004; Baschnagel et al., 2009; Bernstein et al., 2007; Blanchard et al., 2004; Galea et al., 2003; Schlenger et al., 2002; Silver et al., 2002) and there are previous studies of indirect exposure by human-made terror in the United States (e.g., Oklahoma bombing) (Baschnagel et al., 2009; Morland, 2000; Pfefferbaum et al., 2000). The events of 9/11 had a significant impact on the nation across many domains that potentially amplified stress responses in individuals who were directly exposed and in individuals who were indirectly exposed (Ahern et al., 2002; Ahern et al., 2004; Baschnagel, et al., 2009; Bernstein et al., 2007; Eisenberg & Silver, 2011; Franz, Glass, Arnkoff, & Dutton, 2009; Galea et al., 2003; Otto et al., 2007; Schlenger et al., 2002; Silver, 2011; Silver et al., 2002; Silver & Mathew, 2008; Suvak, Maguen, Litz, Silver, & Holman, 2008). These studies have found trauma effects much wider than previous terrorist events in the United States or other previous traumatic events that have occurred in the United States (e.g., natural disasters). The results from these studies have intensified an ongoing debate as to what circumstances constitutes "exposure," which can lead to PTSD (Galea & Resnick, 2005; Neria, DiGrande, & Adams, 2011).

### *Trauma exposure in the United States*

Trauma exposure is fairly prevalent in the United States (Galea et al., 2005; Galea & Resnick, 2005; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Neria, DiGrande & Adams, 2011; Silver et al., 2002). A national study found 15% of adult women and 19% of adult men have been exposed to a disaster at some point in their life (Kessler et al., 1995; Kessler, Sonnega, Bromet, Hughes, Nelson, & Breslau, 1999) and some studies have found a lifetime prevalence of potential traumatic experiences in the general population ranging from 39% (Breslau, Davis, Andreski, & Peterson, 1991) to 69%

(Boudreaux, Kilpatrick, Resnick, Best, & Saunders, 1998; Norris, 1992; "How Common is PTSD?" 2007). The relatively low PTSD rate in the United States compared to other countries is interesting. Friedman, Resick, & Keane (2007) compared the United States to Algeria. In the United States (U.S.), estimated lifetime trauma exposure is 50-60%, while PTSD prevalence is estimated to be 7.8%. In Algeria, lifetime trauma exposure is estimated to be 92%, while PTSD prevalence is estimated to be 37.4%. The difference in prevalence rates between the U.S. and Algeria (taking in account the relative lifetime trauma prevalence rates) is unexpected. However, the U.S. has higher rates of PTSD than other countries/cultures; some cultures claim PTSD does not exist in their society (Kessler et al., 2005). Whether these differences truly exist or cannot clearly be established (at least at this time), it is certainly worthy of notation as they may provide clues to prevention, causation or both.

*9/11 Trauma Effects on Physical and Mental Health*

September 11th, 2001 induced trauma both physically and mentally. Negative health effects from these events are still emerging today. Negative physical health effects include respiratory illnesses, cancers, gastro-esophageal reflux disease, sinusitis, heart disease, and other physical ailments (Feeney & Wallack, 2011; Wisnivesky, Teitelbaum, Todd, et al., 2011). Exposure to traumatic experiences is associated with an increased risk of mental disorders (Boudreaux et al., 1998; Friedman, Resnick, & Keane, 2007; Galea & Resnick, 2005). In populations that experience disasters, the most common negative mental health effects are anxiety and affective disorders (Galea & Resnick, 2005; Mauer, 2011; Perlman et al., 2011; Wisnivesky et al., 2011). In the aftermath of 9/11, most investigators have focused on trauma related disorders, the most common being PTSD (Eisenberg & Silver, 2011; Galea et al., 2005; Galea & Resnick, 2005). The focus on PTSD in 9/11 victims is largely based on evidence from prior disaster research, which has shown that PTSD is the most prevalent type of mental syndrome following disasters (Galea et al., 2005; Neria, DiGrande & Adams, 2011; Norris, Friedman, Watson, et al., 2002; "How Common is PTSD?" 2007).

**Posttraumatic Stress Disorder (PTSD), Symptoms and Comorbid Disorders**

PTSD is a disorder that can develop at any age. It can develop in individuals who witness or experience a traumatic event that individuals perceive as a threat to themselves or others (e.g., death or harm). Traumatic experiences can be the result of assault, physical abuse, psychological abuse, rape, accidents, death of a loved one, medical conditions, divorce, natural disasters, terrorism, war, etc. The events typically inflict intense feelings of fear and/or helplessness – these feelings are often subjective so the type of event is less important than the individual's "perception" of the event or recurrent events. Prominent features of such intense fear and also predictors of PTSD development are the "level" of panic, the presence of emotional numbing, and/or the feeling of dissociation at the time of the experience (Friedman, Resick, & Keane, 2007).

PTSD symptoms tend to fall in three distinct categories according to the National Institutes of Health. One category is the experience of reliving the event. These types of symptoms can manifest as flashbacks of the event, intrusive memories of the event, mentally reliving the event over and over (often upsetting), repeated nightmares of the event, and hyper-arousal to things in the environment that remind the person of the event. These "triggers" may not be obvious reminders but match enough specific characteristics to trigger a strong stress reaction or memory recall. The second cluster of symptoms, referred to as avoidance, logically follow the first cluster of symptoms. People with PTSD tend to avoid things that remind them of the event. Often avoidance is not possible so other strategies are used to prevent emotional overwhelm. These include emotional numbing or apathy, feeling detached, blocking of memories, which can manifest as poor recall of events, actual detachment from emotions or not revealing one's mood, and hopelessness (e.g., the feeling of having no future or more specifically, not feeling there is hope for a positive future). The third cluster of symptoms involves emotional arousal. These symptoms can manifest as irritability or anger outbursts, startling easily or an exaggerated startle response, difficulty concentrating and having trouble falling or staying asleep. Other symptoms can include feelings of guilt or shame, agitation or excitability, dizziness, fainting, rapid heart rate or pounding heart, and headaches (e.g., tension, migraine, cluster, etc.) ("Post-traumatic stress disorder," 2012).

It is also common for people with PTSD to have comorbid disorders such as anxiety disorders, affective disorders, adjustment disorders, somatic symptoms, and/or substance abuse disorders (Boscarino et al., 2006; Kessler et al., 1995; Neria, DiGrande & Adams, 2011; Norris, Friedman, Watson, et al., 2002; Yehuda, 2002). A large representative sample found that 62-88% of individuals with PTSD have multiple psychological disorders (Boudreaux et al., 1998) and also in returning veterans from Afghanistan and Iraq (Seal, Berenthal, Miner, Sen, &Marmar, 2007).

**History of PTSD and the Diagnostic Statistical Manual**

The definition of PTSD, as defined by the Diagnostic Statistical Manual (DSM) published periodically by the American Psychiatric Association, changes with each new or revised edition. This is in part because PTSD was not recognized as an independent disorder until the DSM III, which was released by the American Psychiatric Association in 1980. PTSD is not a new phenomenon per se -- there is historical evidence of similar symptoms after wars or other traumatic events in classic literature. In the 1800s, the term "fright neurosis" was used to describe anxiety symptoms that manifested after accidents and injuries. After World War II, the first volume of the DSM (DSM-I; American Psychiatric Association) was introduced in 1952, which included a disorder similar to PTSD that was referred to as "gross stress reaction." Like "fright neurosis," it was also indicative of an extreme stress reaction following a traumatic event. During the Vietnam War (1955-1975), the DSM-II (American Psychiatric Association, 1968) was introduced and the condition "gross stress reaction" was deleted from this edition. Instead, two other definitions emerged ("transient adjustment disorder of adult life" and "fear of military combat manifested by trembling, running, and hiding"). At the time, a future American Psychiatric Association (APA) president John Talbott (who served in Vietnam in 1969 as a psychiatrist), fought for the reinstatement of "gross stress reaction" in the DSM after returning from Vietnam claiming the DSM-II did not provide any accurate diagnostic category, where the prior DSM-I "gross stress reaction" did. Some people have speculated that the removal of "gross stress reaction" was politically motivated (for a detailed account, see Bloom, 2000). The 1970s marked a huge mental health movement largely in part because of Vietnam War veterans but also because of domestic child abuse issues, the women's movement, greater societal concern about rape, and President

Carter's Mental Health Initiative (DeLeon, Fox, & Graham, 1991; Friedman, et al., 2007; Petersen, 2007).

*DSM-III and PTSD*

In 1980, the DSM-III (American Psychiatric Association) was released, which included for the first time the diagnostic category of PTSD under anxiety disorders. Unlike previous DSM editions with the aforementioned diagnostic categories, the DSM III had four specific criteria: 1) a person needs to have experienced some traumatic event (recognizable stressor) that caused extreme distress that most people could not handle; 2) at least one of three types of re-experiencing symptoms (e.g., flashbacks); 3) at least one symptom of emotional numbing (e.g., constricted affect); and 4) at least two of several types of symptoms (e.g., trouble concentrating, guilt, easy to startle, etc.). In addition, three PTSD subtypes were identified: 1) acute (less than 6 months); 2) chronic (lasting more than 6 months); and 3) delayed onset (occurring after 6 months).

The recognition of PTSD as an independent disorder and Carter's Health initiative resulted in funding that spurred a lot of research into the epidemiology and treatment of the disorder. Prevalence studies as well as PTSD instrument developments soon emerged and treatment outcomes started emerging in the mid 1980s. Recognition of a certain symptom pattern in a certain subset of people who have experienced traumatic events became more apparent as more research has emerged but there was and still is controversy. One issue with trying to define PTSD is determining what exactly the criteria should be. The experience of trauma is common but only a small percentage of those traumatized develop PTSD (Bonanno, 2004; Ozer, Best, Lipsey, & Weiss, 2003). As mentioned prior, in the United States, lifetime trauma exposure is estimated to be 50-60%, with PTSD prevalence estimated to be 7.8% (Friedman, Resick, Keane, 2008; Kessler et al., 1995). Please refer to the epidemiology section for further information regarding trauma types and percentages.

*DSM-IV, DSM-IV-TR and PTSD*

The DSM-IV (American Psychiatric Association) was released in 1994. A revised edition was released in 2000 (DSM-IV-TR) (American Psychiatric Association). PTSD criteria changed slightly, from the DSM-III revised edition (American Psychiatric Association).

The DSM-IV and DSM-IV-TR had changes with respect to Criterion A and it added Criterion F. The revised editions require an individual to meet Criterion A, one of the symptoms of Criterion B, three of the symptoms of Criterion C, two of the symptoms of Criterion D, Criterion E and Criterion F (pp. 427-428).

Criterion A is comprised of two parts. They are: 1) "The person has experienced, witnessed, or been confronted with an event or events that involve actual or threatened death or serious injury, or a threat to the physical integrity of oneself or others" and 2) "The person's response involved intense fear, helplessness, or horror. Note: in children, it may be expressed instead by disorganized or agitated behavior."

The presence of one of the following five symptoms meets Criterion B (the traumatic event must have a re-experiencing component). The symptoms are, 1) "Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. Note: in young children, repetitive play may occur in which themes or aspects of the trauma are expressed," 2) "Recurrent distressing dreams of the event. Note: in children, there may be frightening dreams without recognizable content," 3) "Acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative flashback episodes, including those that occur upon awakening or when intoxicated). Note: in children, trauma-specific reenactment may occur," 4) "Intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event," and 5) "Physiologic reactivity upon exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event."

The presence of at least three persistent avoidant behaviors related to the trauma and/or the presence of emotional numbing (not experienced before the trauma) must occur to meet Criterion C. The symptoms are, 1) "Efforts to avoid thoughts, feelings, or conversations associated with the trauma," 2) "Efforts to avoid activities, places, or people that arouse recollections of the trauma," 3) "Inability to recall an important aspect of the trauma," 4) "Markedly diminished interest or participation in significant activities," 5) "Feeling of detachment or estrangement from others," 6) "Restricted range of affect

(e.g., unable to have loving feelings)," and 7) "Sense of foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal life span)."

The person must have two symptoms of hyper-arousal that was not present prior to the traumatic event to meet Criterion D. The symptoms are 1) "Difficulty falling or staying asleep," 2) "Irritability or outbursts of anger," 3) "Difficulty concentrating," 4) "Hyper-vigilance," and 5) "Exaggerated startle response."

Individuals must also meet Criterion E for duration. The temporal Criterion is "Duration of the disturbance (symptoms in B, C, and D) is more than one month."

Lastly, individuals must exhibit functional impairment to meet Criterion F. Impairment is defined as "The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning."

Like the previous edition of the DSM, PTSD needs to be specified as acute, chronic, or delayed onset. An important distinction between the 3rd edition and the 4th edition is the assumption that the "traumatic" event does not have to be one that most people cannot handle but rather focuses on the "intensity" of a person's reaction to the event. This is an important distinction as it is apparent that all people do not respond the same way to the same event – other factors likely play a role in the development of PTSD. In addition, the 4th edition redefined acute as less than three months, chronic as more than three months, and delayed as developing after 3 months.

*Acute Stress Disorder (ASD)*

The DSM-IV-TR, revised edition, (American Psychiatric Association, 2000) also added an additional disorder that is very similar to PTSD but lasting less than a month. The new disorder is referred to as Acute Stress Disorder (ASD). However, the criteria for ASD are slightly different compared to PTSD. The Criterion A is still required as well as a symptom from criteria B, C, and D (re-experiencing, avoidance, and arousal) or "marked avoidance and arousal" but an individual must also exhibit three of the following either during or after the event: 1) "A subjective sense of numbing, detachment, or absence of emotional responsiveness," 2) "A reduction in awareness of his or her

surroundings," 3) "Derealization," 4) "Depersonalization," and 5) "Dissociative amnesia." In other words, it is possible that someone can be diagnosed with ASD and their symptoms remain constant/unchanging but they do not meet the PTSD criteria once a month has passed. Some have suggested this is not problematic if ASD is viewed as an acute stress reaction (ASR) and PTSD as a different disorder (Bryant, Friedman, Spiegel, Ursano & Strain, 2010). For the purpose of this dissertation the term "Acute Stress Reaction" (ASR) or "PTSD-like symptoms (subclinical)" will be used to refer to research that measured immediate stress reactions (less than one month) that do not meet all criteria for Acute Stress Disorder (ASD).

*Debate of PTSD and ASD*

The decision to include ASD in the DSM-IV-TR was based largely on recommendations from the DSM-IV Dissociative Disorders subcommittee, who recognized that individuals who had dissociative symptoms either during the stressor or soon after, were more likely to develop PTSD in the future than those who did not manifest these symptoms (Friedman, Resick, Keane, 2007). According to the Veterans Affair's PTSD website ("Acute Stress Disorder," 2012), 80% of people who develop ASD will eventually develop PTSD. While ASD may be sensitive for detecting certain types of early responses that may turn into PTSD, it fails to detect approximately 50% of individuals who meet PTSD criteria later. Some have suggested that the criteria of dissociation be removed to make the ASD more sensitive. Dissociation in ASD appears to occur in people with dissociative tendencies. There is a relationship between dissociative tendencies and childhood trauma, which itself is a PTSD predictor – it remains unclear if dissociative responses are from childhood trauma or individuals with dissociative tendencies are likely to experience or report childhood trauma. However, what seems apparent is that dissociative responses are predictive of PTSD in some individuals. The introduction of ASD helps bridge the time between the traumatic event and the following weeks, when PTSD cannot be applied -- often the diagnosis of adjustment disorder is applied when it may not be appropriate (Bryant, Friedman, Spiegel, Ursano & Strain, 2010).

The debate of PTSD and ASD cannot be understated. There are numerous reasons why this is the case. First, PTSD was introduced by demand of the public as opposed to academics (Friedman et al., 2007). Second, its definition frequently has been modified. According to Rosen, Lilienfeld, Frueh, McHugh, & Spitzer (2010), the first PTSD definition in the DSM-III (assuming Criterion A was met) yielded a possible diagnosis of PTSD with 135 combinations of criteria B, C and, D clusters (with 12 possible symptoms).

The DSM-IV (meeting Criterion A and the same three clusters) could yield 1,750 combinations (17 possible symptoms). The proposed DSM-5 (meeting Criterion A and four clusters) could yield 10,500 possible combinations (21 symptoms). One main concern is construct validity. In addition, there is a proposed segment that excludes some indirect exposure to an event (e.g., media exposure). This raises interesting questions on several levels but Rosen et al. (2010) contend that there is a need for a more restrictive operationalized construct, noting that the range of possible symptoms may represent multiple disorders and/or different disorders. Another element discussed is the different type of reactions under stress such as anger, guilt, shame and disgust and some contend that fear is not necessary to develop PTSD (Bryant et al., 2010). It should be noted that fear is not needed to cause change to the "fear" circuitry system in the brain (Handwerger, 2009) and individuals with PTSD show evidence of changes in both the amygdala and the hypothalamic-pituitary-adrenal axis (HPA axis) (fear and stress circuitry) (Handwerger, 2009; Shin & Handwerger, 2009; Yehuda, 2002). The types of changes to the HPA axis in PTSD individuals are relatively different than those seen in other mental disorders (e.g., depression) (Yehuda, 2002). It should also be noted that other changes in the brain are reported in PTSD that differ between PTSD subjects. These variable changes appear to relate to the type of stress reaction (e.g., fear, anger, disgust, shame, guilt, etc.), the type of trauma, and gender (Handwerger, 2009).

The DSM-5 (American Psychiatric Association, 2013) has adopted the changes mentioned above. Despite numerous studies reporting 9/11 media associated PTSD (Ahern et al., 2002; Ahern et al., 2004; Baschnagel, et al., 2009; Bernstein et al., 2007;

Eisenberg & Silver, 2011; Franz et al., 2009; Galea et al., 2003; Otto et al., 2007; Schlenger et al., 2002; Silver, 2011; Silver et al., 2002; Silver & Mathew, 2008; Suvak et al., 2008), it and other indirect "subjective" experiences (per subjective reasoning) have been removed. As evidenced in *f*MRI studies (see Handwerger, 2009), it was decided fear is not necessary for the development of PTSD. Other emotional reactions are now accepted to occur in association with PTSD (e.g., anger, disgust, shame, guilt, etc.). In addition, PTSD now falls under a new category called "Trauma and stress related disorders" instead of placing it under anxiety disorders. There is an additional Criterion based on several factor studies commonly referred to as "numbing" making it an independent criterion or construct although symptoms included under this criterion are multifaceted (American Psychiatric Association, 2013). While some researchers are happy about the elimination of subjectivity, they are not happy with the new Criterion suggesting it does not capture "true" PTSD but rather it taps into specific types of PTSD (personal communication with psychiatrist Carol North, August, 2013).

What constitutes PTSD, hence, still remains to be debated. One issue with trying to define PTSD is determining what exactly the criteria should be. As mentioned above, the experience of trauma is common but only a small percentage (approximately 7.8% in the United States) (Friedman et al., 2007) of those traumatized develop PTSD (Bonanno, 2004; Ozer, Best, Lipsey & Weiss, 2003) and individuals who have PTSD vary in their symptom frequency and severity that is not easily defined. There are also differences found between types of traumas (e.g., rape, natural disasters, terrorism) and fluctuations in the same trauma event but different people. In addition, within the same person, symptom frequency and severity can fluctuate across time. This makes comparisons between trauma groups, same trauma groups (e.g., direct exposure or indirect exposure, same event), and individuals' trauma level hard to draw definitive or even approximate predictions or conclusions (Galea et al., 2005; Galea & Resnick, 2005; Kessler et al., 1995; Norris et al., 2002; North & Pfefferbaum, 2002). Therefore, in the current study, it will be considered if the participants meet some of the DSM-IV criteria for PTSD (despite early measurement, i.e., 10-30 days post 9/11) as measured by the IES and PCL.

## Epidemiology of PTSD

### *Prevalence*

The prevalence of PTSD varies depending on the type of trauma, proximity (social or physical), intensity, degree of exposure, duration of exposure, pre-trauma stress load, prior PTSD, prior trauma or other mental disorders (Franz, Glass, Arnkoff & Dunn, 2009; Kessler et al., 1995), and demographics (Galea & Resnick, 2005; Green & Lindy, 1994). In the general population, PTSD is the fourth leading type of mental disorders. The lifetime prevalence of PTSD in the United States is estimated to be 5-6% for men and 10-14% for women (Kessler et al., 1995, 1999; Neria, DiGrande & Adams, 2011). As mentioned previously, trauma exposure is common. Kessler et al. (1995) reported the lifetime prevalence of trauma to be 60.7% for men and 51.2% for women in the United States from a predetermined list of 12 questions that met Criterion A for the DSM-III Revised (American Psychiatric Association, 1987). They also found an overwhelming majority reported more than one trauma with an almost equal distribution reporting either two, three, four, or more than four trauma events. They also found PTSD is highly dependent on trauma type. In this study, the highest impact traumas for men were rape, combat, neglect and physical abuse respectively and the highest impact traumas for women were physical abuse, rape, "other qualifying trauma," and "threat with weapon" respectively. With the exception of rape and physical abuse, women were more likely to have PTSD, which they conclude is partly dependent on women being exposed to higher risk traumas. Overall, women were more than twice as likely as men to have PTSD. Interestingly, although the abovementioned traumas were associated with the highest PTSD prevalence, what individuals rated as "most upsetting" did not always correspond with PTSD (at least for that trauma). For example, rape was rated the "most upsetting event" in both sexes and the strongest predictor of PTSD but other highly rated "most upsetting" events were not strong predictors such as witnessing (i.e., "you witnessed someone being badly injured or killed"). Although PTSD does occur in individuals who have witnessed a traumatic event, the development is more common in individuals who have "direct" exposure as opposed to "indirect" exposure (e.g., media). It is also more likely to develop as the result of traumas that involve interpersonal violence (Norris, 2002). More systematic methods are needed but it is suspected that the lifetime

prevalence of PTSD in the United States mentioned above is likely underestimated (Kessler et al., 1995). The current study involves participants who experienced either direct (near the WTC) and/or indirect exposure (e.g., media).

*Risk Factors*

*Pretraumatic, Peritraumatic and Posttraumatic*

Risk factors for PTSD appear to fluctuate depending on many variables but generally fall in three categories (i.e., pretraumatic, peritraumatic, and posttraumatic) (Friedman et al., 2007; Vogt, King, & King, 2007). Pretraumatic factors are mostly demographic (e.g., older age, female gender, Hispanic ethnicity, lower educational level, lower socioeconomic status, etc.), other pre-existing conditions (e.g., prior mental illness [especially PTSD], childhood abuse, prior trauma, and degree of stress prior to trauma. Peritraumatic risk factors relate to the event and the individual's response to the event (e.g., type of trauma, intensity of trauma, proximity to trauma, duration of trauma, emotional response to the trauma, etc.). In terms of posttraumatic predictors, the largest risk factor is social support. Other adverse events after the trauma such as financial issues, health issues, and/or poor continuous social support are also major factors of PTSD development and persistence of posttraumatic stress (Friedman et al., 2007). A meta-analysis of risk factors for PTSD (Brewin, Andrews, & Valentine, 2000) revealed gender ( $r$ = -.04-.31; weighted $r$ = .13), age of trauma ( $r$ = -.38-.28; weighted $r$ = .06), and race ( $r$ = -.27-.39; weighted $r$ = .05) as modest predictors in some populations; education ( $r$ = -.11-.37; weighted $r$ = .11), previous trauma ( $r$ = -.05-.36; weighted $r$ = .12), and general childhood adversity ( $r$ = .09-.60; weighted $r$ = .19) as fairly consistent but modest predictors; psychiatric history in the person or family ( $r$ = .00-.29; weighted $r$ = .19) and child abuse ( $r$ = .07-.30; weighted $r$ = .14) as modest consistent predictors; and factors occurring during or after the trauma such as trauma severity ( $r$ = -.14-.76; weighted $r$ = .23), lack of social support ( $r$ = -.02-.54; weighted $r$ = .40), and life stress ( $r$ = .26-.54, weighted $r$ = .32) as stronger predictors of PTSD. Another meta-analysis (Ozer, Best, Lipsey, & Weiss, 2003) found seven PTSD predictors (weakest to strongest [ $r$ = .17-.35]): prior trauma, prior psychological adjustment, family history of psychopathology, perceived threat during trauma, posttrauma social support, posttraumatic emotional reactions, and peritraumatic dissociation. It appears that the best predictors of PTSD are

peritraumatic and posttraumatic (which highlights the importance of early diagnosis and treatment), however, given the range of predictive effects by trauma type and other populations, it would seem prudent to use all available tools. In the current study, demographic risk factors were measured. They include age, gender, race, relationship status, religion, and highest educational level.

*Exposure and Proximity*

As mentioned earlier, natural disasters tend to have lower PTSD rates than terrorist attacks (Galea & Resnick, 2005; Galea et al., 2003; Huddy & Feldman, 2011). Natural disasters and terrorist attacks are similar in that they usually involve a significant amount of individuals directly affected by the event. However, terrorist attacks are intended to evoke terror not only in those who directly experience it but also in those who indirectly experience it (Galea & Resnick, 2005; Galea et al., 2005; Galea et al., 2003; Huddy & Feldman, 2011; Schlenger et al., 2002; Silver et al., 2002; Stein et al., 2004; Yehuda; 2002). In terms of those directly affected (i.e. direct exposure) or those indirectly affected (e.g., exposure via the media), it is apparent the line between direct and indirect becomes blurred (Galea & Resnick, 2005; Galea et al., 2003). Studies regarding the Oklahoma bombing evidenced elevated levels of stress and PTSD symptoms in individuals who had greater level of exposure and greater proximity to the site (North, 2001; North et al., 1999; North et al., 2004). Other studies have found PTSD symptoms in children who were indirectly exposed (Pfefferbaum, 2001; Pfefferbaum et al., 2000; Sprang, 2001). This was also the case with 9/11 (Neria et al., 2011). Studies that have investigated PTSD prevalence after 9/11 have produced mixed results (Neria et al., 2011). A large national longitudinal study (Silver et al., 2002, 2006) investigated acute stress reactions (ASR) (DSM-IV criteria B, C, D, and E) two weeks post 9/11 and PTSD using the PCL checklist (Weathers et al., 1993) one year after 9/11. They found individuals who were directly exposed had a 9.3% prevalence of ASR and an 11.2% prevalence of PTSD. Individuals who watched the events live on T.V. had a 12.8% prevalence of ASR and a 4.7% prevalence of PTSD. Individuals with no live exposure had a 10.4% prevalence of ASR and a 3.4% prevalence of PTSD. They found greater PTSD in those with ASR, direct exposure, prior mental or physical illnesses, prior traumas, and various demographics. Furthermore, they found trauma occurring after 9/11

was a significant predictor of PTSD even when all other predictors were controlled (Silver et al., 2006). Even though direct exposure increases the risk of PTSD, it is clear that trauma does not have to involve direct personal exposure – pretraumatic, peritraumatic, and posttraumatic factors play a large role in the development and persistence of PTSD or ASD. In the present study, two variables are included to measure "degree" of exposure (physical and social). The current data set has two variables that could indicate some degree of exposure (i.e., distance from the WTC on the morning of 9/11 and if an individual was physically injured, lost a relative, co-worker or acquaintance).

*Coping*

Coping strategies, resiliency, and culture can also have an effect on PTSD development and maintenance (Bonanno, 2004). In the case of terrorism, "style of information seeking" during stressful situations seems particularly relevant since many studies have found indirect effects of increased ASR and/or PTSD in individuals whose only exposure was media of the events (Schlenger et al., 2002; Schuster et al., 2001, Silver et al., 2002). Miller (1987) developed a coping scale (Miller Behavioral Style Scale) based on "style of information seeking" during periods of perceived stressful and/or threatening events. The MBSS attempts to identify individuals who seek out information (i.e., Monitors) and/or avoid information (i.e., Blunters). Monitors are considered to use an active coping style while Blunters are considered to use an avoidant coping style (Miró, 1997). The Monitor and Blunter subscales of the MBSS are independent constructs -- studies have generally found low correlations between the two constructs (Ben-zur, 2002; Keinan et al., 2003; Miller, 1987). Thus, an individual can be both a high "Monitor" and a high "Blunter" or any combination of the two coping styles. However, individuals tend to have a preferred mode of coping, which may be dependent on the type of perceived threat. A study (Keinan et al., 2003) on terrorism measured MBSS coping styles in 534 Israelis. As they expected, high "Monitors" were more likely to exhibit symptoms of PTSD after a terroristic attack however, the authors did not expect to find that high "Blunters" also manifested PTSD symptoms. They found the higher the score on "Monitoring," the more likely an individual preferred more diverse and more continuous T.V. coverage of the event. These individuals also scored

significantly higher on re-experiencing symptoms, nightmares, angry outbursts and total PTSD scores. Individuals who scored high on "Blunting" preferred being exposed to limited media coverage. They also scored significantly higher on post-exposure nightmares, re-experiencing symptoms, and total PTSD scores (Keinan et al., 2003). In the current proposed study, the MBSS is used to determine if "Monitoring" and/or "Blunting" coping styles are associated with increased ASR/PTSD-like (subclinical) symptoms.

One shortcoming of many studies of PTSD and specifically those involving 9/11 is obtaining immediate measurements of acute stress responses in those exposed and those indirectly exposed. Many researchers have stressed the importance of obtaining information about measuring immediate effects (North & Pfefferbaum, 2002; Schuster et al., 2001; Silver et al., 2005, 2006) but often it is not feasible and some consider it potentially unethical (Neria et al., 2011). Unfortunately, the nature of trauma can skew memory recall so studies investigating immediate responses months to years later are inherently limited by recall bias; many people deny reporting symptoms they actually reported close to the occurrence of the trauma (North et al., 1997; Silver et al., 2006). In the case of 9/11, only two studies (both nationally representative) obtained information during the month after 9/11(Neria et al., 2011). One study was discussed above (Silver et al., 2002, 2005, 2006) and the other was a random dial survey that occurred 3-5 days after 9/11. They asked 560 people who agreed to the interview five questions from the PCL (Schuster et al., 2001). Responders were asked to rate their symptom severity on a 5-point scale (1= not at all, 5 = extremely). They also asked how many hours of T.V. they watched on 9/11. If a person responded to one question of the five with a rating of four or five, they were considered to have a high stress response. They found that 44% reported at least one high stress response and this was significantly positively correlated with the number of hours viewing T.V. on 9/11. Forty-four respondents were less than 100 miles away from the WTC, and as with other studies, closer proximity resulted in higher stress responses. The Silver et al. (2002) study identified 2% having direct exposure with respect to planes, the Pentagon, and the WTC. Two people were on the phone with someone; three could hear or feel the attacks; one could see people evacuate, jump, or fall; two were within two blocks; and two were in the Pentagon or WTC. Fourteen knew

someone who lost property, three lost property, five knew someone close who was injured, eight knew a close person who died, and one person was injured in the attack.

**Current Investigation**

Clearly, research on immediate stress effects after 9/11 is limited; especially with respect to individuals who were in close proximity to the WTC. An archived data set collected in the immediate aftermath of 9/11 was used in the current study and was obtained by New York Mercy College researchers. It allows for a unique opportunity to assess acute stress reactions and stressful information coping styles 10 days to 30 days after 9/11 in individuals who attended or worked at a New York City metropolitan college. In the current study, the following variables were collected: 1) age 2) gender, 3) relationship status, 4) religious affiliation, 5) highest level of education, 6) living situation, 7) distance from the WTC at the time of the attack, 8) if the individual loss someone in the WTC attack, and 9) media exposure. Acute stress reactions were measured using the IES scale and the PCL scale. Stressful coping preferences were measured using the MBSS scale. A comprehensive review of PTSD and ASR following 9/11 in individuals within close proximity (Neria et al., 2011) indicates that immediate stress reactions, risk factors, and coping preferences were very limited. The purpose of this study is to add to the body of knowledge of public health psychological research regarding a NYC metropolitan college population in terms of demographics, physical proximity, social proximity, media exposure, "stressful information" coping styles and their relationship to ASR/PTSD-like (subclinical) symptoms and to determine the prevalence of ASR/PTSD-like (subclinical) symptoms in this population 10-30 days post 9/11. Reliabilities and exploratory factor analyses of validated measures are also presented.

*Goals of the Proposed Study*

1) To report physical proximity, social proximity, and media exposure about this sample in terms of frequency and percentages and when appropriate means and standard deviations. Evaluation of the archived data set demonstrated little variability. Therefore, this information is presented categorically.

2) To determine the mean and standard deviation of the IES, PCL, and MBSS (Monitoring and Blunting) in this sample, to report internal consistencies for the IES, PCL and to conduct exploratory factor analyses for the IES and PCL in this sample.
3) To determine if social proximity, physical proximity, media exposure, age, gender, race, and coping styles contribute to PTSD-like symptoms (subclinical) as measured by the IES and PCL as continuous variables.
4) To determine the prevalence of PTSD-like (subclinical) symptoms in this population using 1) recommended cutoff scores for the IES and PCL and 2) the DSM-IV criteria B, C and D for PTSD (i.e., a recommended alternative scoring method for the PCL) for the PCL. The use of both scoring methods is considered the best according to the VA National Center for PTSD (PTSD Checklist [PCL], 2012).

# CHAPTER 2. METHODS

## Overview

An archived data set, which was acquired by Dr. Barbara Melamed (former Professor at Mercy College), was used in the current study. Dr. Melamed was the lead researcher of the 9/11 study conducted at Mercy College. Mercy College originated in Catholicism, which was founded in 1950 by the Sisters of Mercy in Tarrytown, New York. In the 1970's, the college decided to become more diverse and announced it was non-sectarian, co-educational, and independent. It expanded by opening additional campuses across New York, including locations in NYC and the immediate NYC metropolitan area ("About Mercy," 2013).

NYC is composed of five boroughs (see Figure 1) covering 310 square miles with a population of approximately 8.23 million people. Manhattan is 23.7 square miles with a population of approximately 1.6 million people (see Table 1). The NYC metropolitan area covers 6,720 square miles with an approximate population of 19 million (see Figure 2). Mercy College currently has five campuses: Bronx, Dobbs Ferry, Manhattan, White Plains, and Yorktown. The current study surveyed three campus locations (see Figure 3). Two are located in NYC and one is located in the immediate NYC metropolitan area (i.e., Dobbs Ferry).

Table 1. NYC and New York State: Population and Size.

| New York City | | | | |
|---|---|---|---|---|
| **Jurisdiction** | | **Population** | **Land area** | |
| *Borough* | *County* | *July 2012 Estimates* | *Square miles* | *Square kilometers* |
| Manhattan | New York | 1,619,090 | 23 | 59 |
| The Bronx | Bronx | 1,408,473 | 42 | 109 |
| Brooklyn | Kings | 2,565,635 | 71 | 183 |
| Queens | Queens | 2,272,771 | 109 | 283 |
| Staten Island | Richmond | 470,728 | 58 | 151 |
| **City of New York** | | **8,336,697** | **303** | **786** |
| State of New York | | 19,570,261 | 47,214 | 122,284 |

*Source: United States Census Bureau 2012*

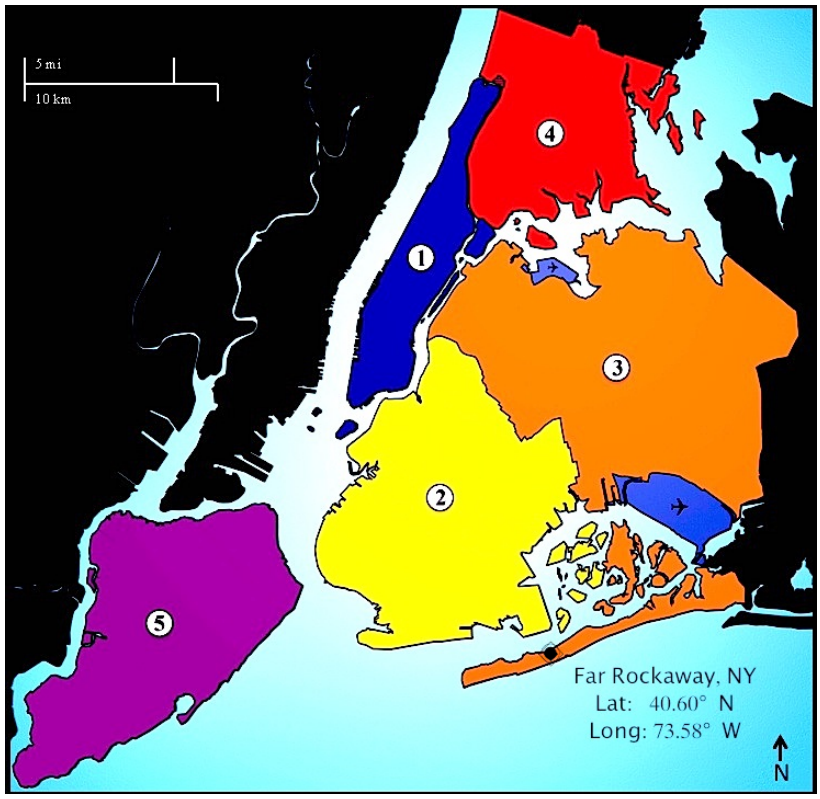


Figure 1. NYC: 1. Manhattan 2. Brooklyn 3. Queens 4. Bronx 5. Staten Island.

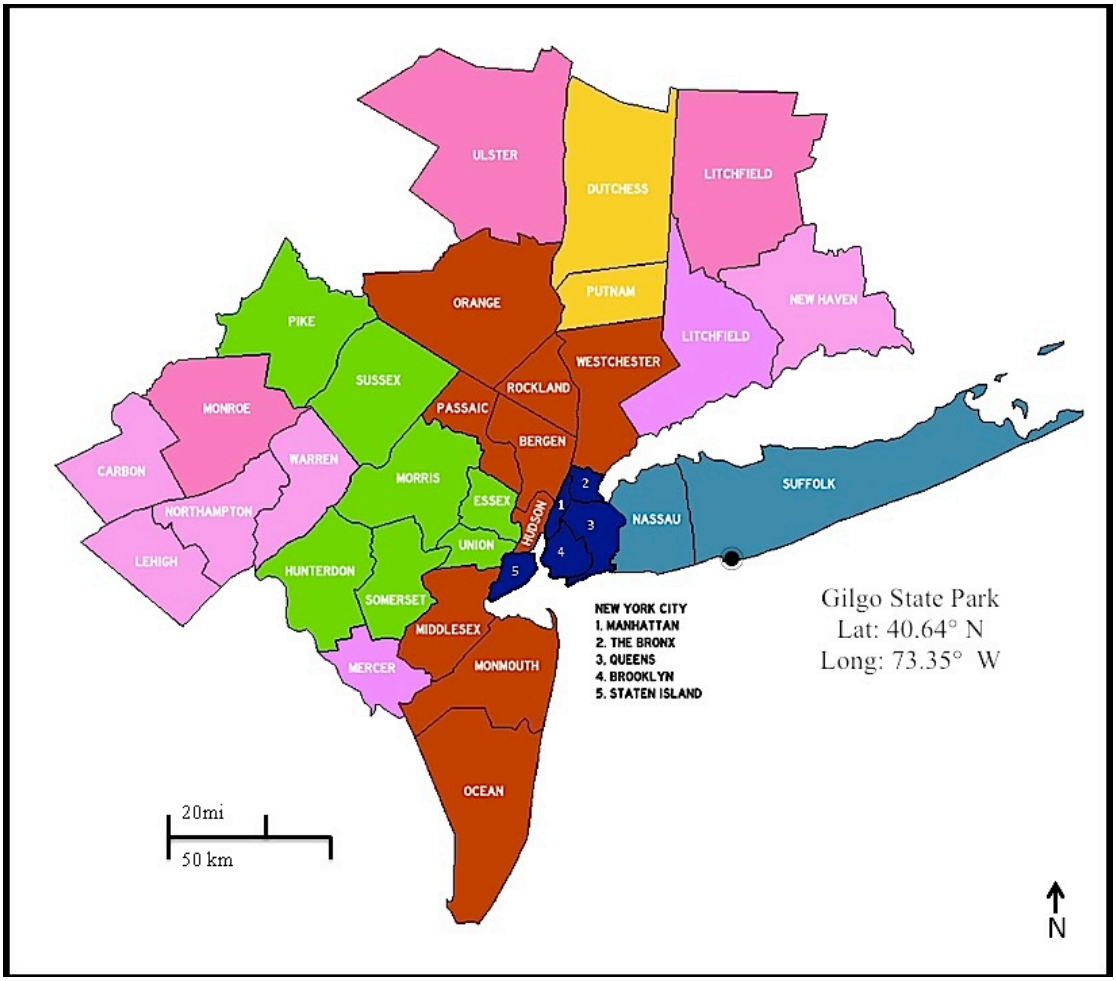


Figure 2. The NYC metropolitan area.

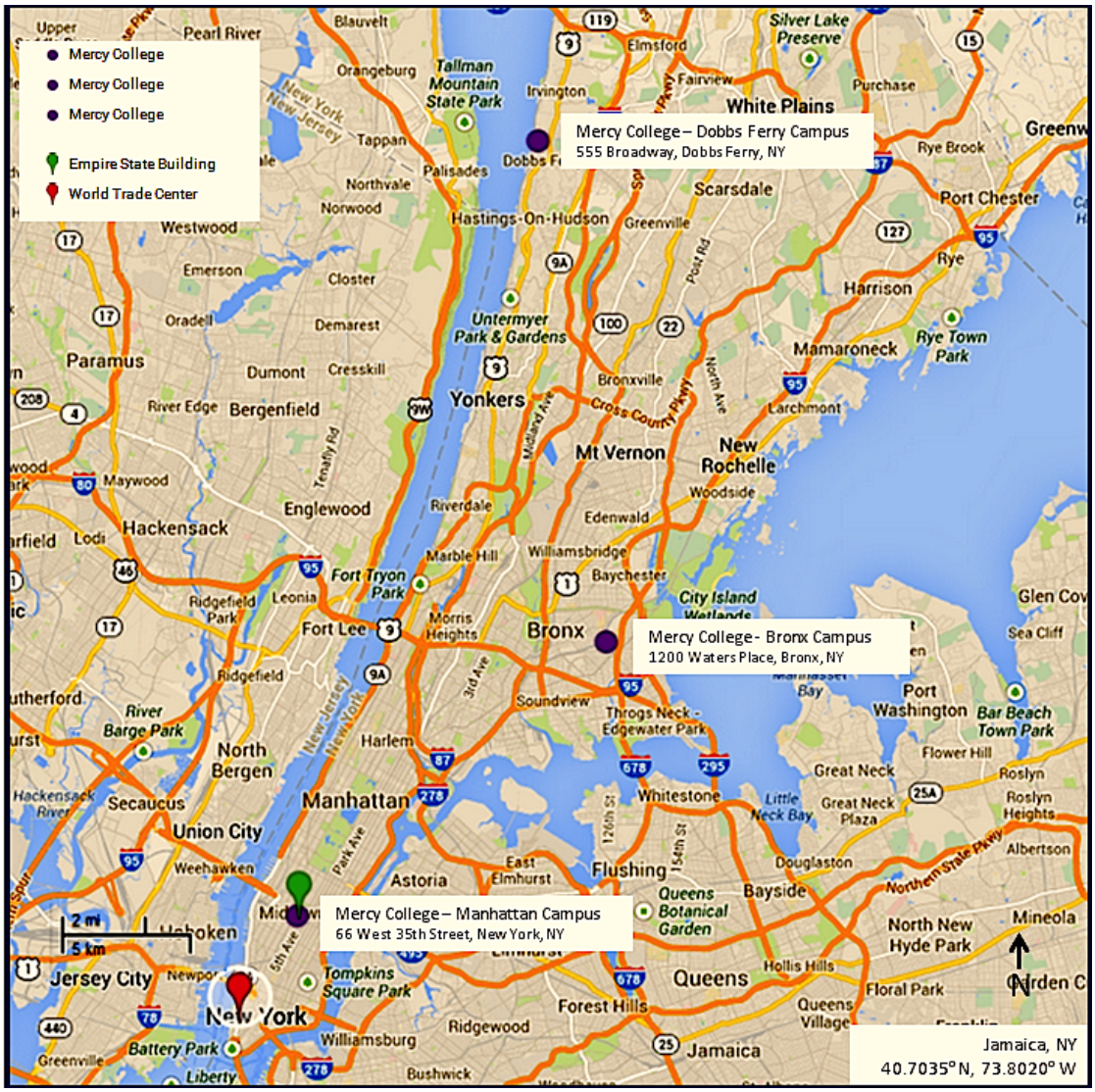


Figure 3. Mercy College Campuses: Bronx, Dobbs Ferry and Manhattan.

**Participants**

Ninety-nine Mercy College students, faculty, and staff participated in the study. Participants attended three possible campus locations (Bronx, Dobbs Ferry, or Manhattan). The participants appear to be fairly racially/ethnically diverse with approximately equal amounts identifying as black, Hispanic or white. Thirty (30.3%) identified as black, 24 (24.2%) identified as white, 33 (33.3%) identified as white-Hispanic, 11 (11.1%) identified as non-white Hispanic and one did not identify with any given choice. Seventy-two (72.7%) identified as female, 25 (25.3%) identified as male, and two (2.0%) did not identify as either. The age range for the sample was 17-58 years

old, with a mean age of 27.61 (S.D. = 10.58). Educational level ranged from MD/PhD to some high school. Five (5.1%) indicated their highest completion was a MD/PhD or equivalent, four (4.0%) indicated a Masters degree (Science or Art) or equivalent, five (5.1%) indicated some graduate school, 19 (19.2%) indicated a Bachelor's degree (Science or Art) or equivalent, 24 (24.2%) indicated either an Associates degree or some college, 36 (36.4%) indicated they were a high school graduate, and one (1.0%) indicated some high school (see Figure 6; Appendix G).

Five choices were given for religion. Fifty-one (51.5%) indicated Catholic, 23 (23.2%) indicated "Other," ten (10.1%) indicated Protestant, eight (8.1%) indicated none, four (4.0%) indicated Jewish, and three (3.0%) did not indicate any choice. Seventy-four (74.7%) indicated they were single, 18 (18.2%) indicated they were married, one indicated they were cohabitating, one (1.0%) indicated they were re-married, two (2.0%) indicated they were divorced, and three (3.0%) did not indicate a relationship status. Eighty-four (84.9%) indicated they lived with someone, 11 (11.1%) indicated they lived alone and four (4.0%) did not indicate. For a comparison of Mercy College students and the sample used in the current study (both fall 2001), please see Appendix F. Comparisons are only made to variables obtained from both the sample and Mercy College 2001 fall demographics. Sample demographics and Mercy College fall demographics are very similar suggesting the sample is representative of Mercy College for fall 2001.

## Procedure

### *Recruitment*

According to researchers at Mercy College, three campus locations were used for recruitment (i.e., the Bronx campus, the Dobbs Ferry campus, and the Manhattan campus). These specific campus sites were used as it was considered that individuals who attended these campuses were the most at risk to have been impacted by the events of 9/11 although recruitment focused heavily on the two NYC campuses. In order to obtain as many participants as possible, a large percentage of faculty at the three target campuses were asked to recruit participants. They were supplied with the surveys and instructed to follow IRB procedures. Recruitment of subjects occurred during September

2001 and October 2001. Administration occurred 10-30 days after 9/11. All three recruitment campuses are within 25 miles of the WTC (Personal communication with Dr. Melamed, June, 2013).

Researchers at Mercy College obtained expedited IRB approval prior to recruitment. Individuals who agreed to participate were informed of their rights as human subjects and other IRB procedures (see Appendix A. Note: IRB survey instructions are from the 2004 study as the instructions for the 2001 study are not available). After participants were informed of their IRB rights, paper surveys and pencils were administered to the participants. The survey was comprised of demographic, proximity, and media exposure questions (see Appendix B; Note: Survey questions are from the 2004 study. Only those contained in the 2001 survey are shown), the IES (see Appendix C), the PCL (see Appendix D), and the MBSS (see Appendix E).

## Measures

*Demographics, Physical Proximity, Social Proximity, and Media Exposure*

Questions selected for use in the study were determined based on whether they were to be used in analyses and/or if they were considered to be meaningful. For example, demographic questions that had a lot of missing values were not used (i.e., question 6, question 8 and question 9) and questions that had no variance were also omitted (i.e., Question 5) (see Appendix B). Questions used in the current study were age, gender, race/ethnicity, relationship status, religious orientation, highest level of education, marital status, living situation, how far individuals were from the site of WTC (i.e. physical proximity) (see Appendix B, question 13), if the person loss someone in the WTC attack (i.e., social exposure) (see Appendix B, question 15), and media exposure (e.g., whether they watched events live, watched multiple replays of the events, etc.) (see Appendix B, question 14). Research studies that investigated media effects from 9/11 found that watching events “live” and watching “multiple replays” of the events contributed to the development of PTSD (Ahern et al., 2002, 2004; Schlenger et al., 2002; Silver et al., 2002). To make the media question more meaningful and useful for the purpose of use in regression analyses, the question was divided into two questions. The first division was watching 9/11 “live” (yes or no). The second division was watching “multiple replays”

(yes or no). The intent of this division was to not have two predictors competing against each other in the same question, which was evidenced in prior 9/11 studies (Neria et al., 2011).

*Impact of Events Scale (IES)*

The IES scale was developed in 1979 (Horowitz, Wilmer, & Alvarez, 1979). It is composed of 15 questions (see Appendix C). Respondents are asked to rank each question on a 4-point scale that was given the following weights: 0 = not at all, 1 = rarely, 3= sometimes, and 5 = often. The measure takes approximately 5 minutes to complete. Score results can range from 0-75 with higher scores indicating more distress. Horowitz et al. (1979) suggested a cutoff score of 19 should warrant clinical concern. As mentioned earlier, trauma does not exist in a vacuum. Trauma is also dependent on the "response" by the person. Subjective experience and other aforementioned "personal" potential factors likely play a role in how a person handles trauma. Horowitz et al. (1979) recognized the interplay of trauma and the individual and designed the IES scale to measure subjective responses to trauma. Although it was developed prior to the introduction of PTSD in the DSM-III, it became one of the most widely used self-report scales for PTSD and other trauma research. The IES purports to measure two constructs (i.e., intrusion and avoidance) and it has been translated into multiple languages (Joseph, 2000, Sundin & Horowitz, 2002).

*Reliability*

Sundin and Horowitz (2002) reviewed 66 studies that investigated the psychometric properties of the IES. Forty were selected for their psychometric soundness and clinical relevance. They found the IES has internal consistency estimates in a range of populations. For intrusion, the mean was $\alpha$ = .86 (range = .72-.92) and for avoidance the mean was $\alpha$=.82 (range = .65-.90). Shalev (1992) used the IES scale to measure trauma after a terrorist attack in intervals of two days, six days and 14 months. He found internal consistency reliability to be .78, .73, and .88 respectively (intrusion and avoidance were grouped).

The IES's stability across time was examined in three studies (one week, six months, and one year). The test-retest reliability for intrusion was .87, .94, and .56

respectively. The test-retest reliability for avoidance (same studies) was .70, .89 and .74 respectively (Sundin & Horowitz, 2002).

*Validity*

Horowitz et al. (1979) postulated that symptoms of trauma fluctuate as a function of time and other events in a person's life. In their original study, they identified two constructs (intrusive and avoidant) that correlated $r = 0.41$. Using eleven studies that employed a two-factor model, Sundin and Horowitz (2002) found the mean correlation between intrusion and avoidance to be $r = .63$. Other factor analytic studies have found one construct (Hendrix et al., 1994; Weiss & Marmar, 1997) and some studies have found three constructs (e.g., also emotional numbing) (Joseph et al., 1994; Foa, Riggs, & Gershung, 1995; McDonald, 1997). Importantly, many researchers have found the correlation of constructs is dependent on the time of assessment (Sundin & Horowitz, 2002). Zilberg et al. (1982) found the correlation between intrusion and avoidance to be the lowest at the earliest assessment $r = .15$ but later assessments indicated the constructs became more associated $r = .78$, which likely relates to the process of coping with trauma (at least with this measure). It is also suggested that some questions measure both intrusion and avoidance. Overall, the ability of the IES scale to support evidence of construct validity is dependent on many factors and with PTSD criteria frequently changing, one advantage is that the IES scale has been used for over 30 years with different populations, different types of traumas, at different time points, making comparisons easier. In addition, despite limited construct validity evidence, the IES appears to be fairly predictive ($R^2 = .88$) of future PTSD (Joseph, 2000). The convergent validity of the IES compared with six other PTSD measures across populations showed correlations for intrusion (range $r = .19 – .75$) and avoidance (range $r = .20$-$.71$). Sundin and Horowitz (2002) speculate that the IES scale measures trauma information not captured by other instruments, which is likely true given that questions vary from measure to measure. It should be noted that the IES was developed for bereavement and to detect general distress, not PTSD (Joseph, 2000; Sundin & Horowitz, 2002). As already noted, Horowitz et al. (1979) indicated that a score of 19 or greater should indicate clinical concern. Compared with structural clinical interviews, Wohlfarth et al. (2003) found a cutoff score of 19 to be sensitive but when modified to 35 they found

specificity increased from 83% to 94%. Neal et al. (1994) also concluded the optimum cutoff score to be 35 when compared to structural clinical interviews – they found a score of 35 produced the best predictability ($R^2$ = .88) and the lowest misclassification (11.4%). In a study comparing stress clinic patients (SCP) with medical students (MS) reacting to a cadaver, the mean score for SCP males was 35.3 (S.D. = 22.6) and the mean score for SCP females was 42.1 (S.D. = 16.7). The mean score for MS males was 6.9 (S.D. = 6.8) and the mean score for MS females was 12.7 (S.D. = 10.8) (Horowitz et al., 1979).

*PTSD Checklist (PCL)*

The PCL (Weathers et al., 1993) is a self-report measure designed to assess PTSD symptoms in adults. It is composed of 17 questions and respondents are asked to rate each question using a 5-point scale (1 = not at all, 2 = a little bit, 3 = moderately, 4 = quite a bit, and 5 = extremely). It takes approximately 5 minutes to complete. Unlike the IES scale, the PCL checklist was developed specifically for PTSD. The PCL checklist attempts to measure PTSD DSM-IV Criterion B (re-experiencing, questions 1-5), Criterion C (avoidance/numbing, questions 6-12) and Criterion D (hyper-arousal, questions 13-17). Scores can range from 17-85 and cutoff recommendations range depending on population characteristics. According to the Veteran's Affair (VA) Center for PTSD ("PTSD Checklist [PCL]," 2012), suggested cutoff scores are based on estimated prevalence and/or setting. For the general population (estimated prevalence 15% or below), the cutoff score recommendation is 30-35 points; VA primary care (estimated prevalence 16 -39%) the recommended cutoff score is 36-44; and for VA or civilian mental health clinics (estimated prevalence 40% or above) the recommended cutoff score is 45-50. In a study of mixed trauma exposed college students ($n$ = 161), the PCL had a mean of 28.1 (S.D. = 10.8) (Adkins, Weathers, McDevitt-Murphy, Daniels, 2008) and in a non-clinical sample of college students ($n$ = 471), the mean was 29.12 (S.D. = 12.31) (Conybeare, Behar, Soloman, Newman, & Borkovec, 2012). The PCL checklist can also be scored using the DSM-IV criteria for B, C and D (a symptom is considered positive if severity is ranked as a 3, 4, or 5). Combining methods of scoring can also be used. The PCL has three versions (military, civilian and specific), which are essentially the same. The PCL military version modifies some questions to be specific about symptoms in relation to "military experience." The PCL civilian and specific

versions are the same questions except the questions do not specify the symptoms to a specific event (e.g., military experience). Instead, the instructions of the PCL civilian version ask that individuals identify a past trauma and then answer questions with respect to that trauma. The instructions of the PCL specific version ask that individuals answer questions with respect to a specific event (e.g., 9/11) ((“PTSD Checklist [PCL],” 2012). Researchers comparing the three versions have found no significant differences with instruction modifications in military populations (Riviere et al., 2011). The PCL checklist has also been translated into other languages (Calbari, 2010; Li, Costa-Requena, & Gil, 2010; Wang, Shi, Zhang, Wu, & Liu, 2010). The PCL (S) was used in the current study (“PTSD Checklist [PCL],” 2012).

*Reliability*

Most studies have found high test-retest reliability and internal consistency estimates for the PCL (Adkins et al., 2008). Weathers et al. (1993) original validation study found a test-retest correlation of $r = .96$ when the scale was re-administered between two and three days and they found the internal consistency to be $\alpha = .97$. Internal consistency for Criterion B, C and D were $\alpha = .93$, $\alpha = 0.93$, $\alpha = .92$, respectively. In a study of trauma exposed college students, the PCL test-retest reliability was $r = .87$ and internal consistency was $\alpha = .91$ (Adkins et al., 2008). A study using a non-clinical college sample reported a test-retest reliability of $r = .66$ and they reported internal consistency on both administrations ($\alpha = .94$, $\alpha = .92$ after two weeks) (Conybeare et al., 2012).

*Validity*

Most studies have found the PCL checklist to have convergent and discriminant validity support in both military (Keen et al., 2008; Weathers et al., 1993) and civilian samples (Adkins et al., 2008, Conybeare et al., 2012; Ruggiero et al., 2003). In civilian samples, the PCL has evidenced sensitivity (range .60-1.0) and specificity (range .76-.99). Sensitivity and specificity varied on the type of sample (e.g., type of trauma), estimated prevalence, and scoring methodology (Brewin, 2005).

Although the PCL checklist was designed to measure three underlying presumed constructs (i.e., re-experiencing, avoidance/numbing, and hyper-arousal), most studies have found 4-factor solutions in clinical populations with avoidance and numbing as

independent constructs (Asmundson, Stapleton, & Taylor, 2004; Conybeare et al., 2012) including in WTC disaster workers (Palmieri, Weather, Difede, & King, 2007). Some researchers have found support for one, two and three factors. In a non-clinical sample of college students, researchers found evidence for both one and two factor models (Conybeare et al., 2012).

*Miller Behavioral Style Scale (MBSS)*

The Miller Behavioral Style Scale (MBSS) was developed in 1985 (Miller, 1987) to try to identify "information" coping styles when dealing with stressful threatening situations (see Appendix E). It is a self-report measure composed of four "threatening" scenarios. Individuals are instructed to read each scenario and then select what they would do in each scenario from a predetermined set of eight choices per scenario. Individuals are asked to choose all that apply. Of the eight choices listed per scenario, four are considered "Monitoring" and four are considered "Blunting." The scale takes approximately five-ten minutes to complete. Monitoring and Blunting scores are summed separately. The score range for both dimensions is 0-16. In the original validation study, two experiments were conducted. In experiment one, the mean for Monitoring was 9.70 (S.D. = 2.63; $n = 30$; $\alpha = .79$) and the mean for Blunting was 5.57 (S.D. = 2.86; $n = 40$; $\alpha = .69$) In experiment two, the mean for Monitoring was 11.10 (S.D. = 2.46; $n = 40$, $\alpha = .75$) and the mean for Blunting was 4.55 (S.D. = 2.09; $n = 40$; $\alpha = .67$) (Miller, 1987).

*Reliability*

A study by Miller and Mischel (1986) administered the MBSS scale to 110 college students with a 4-month interval between testing. They found the test-retest reliability to be $r = .72$ for Monitoring and $r = .75$ for Blunting. Internal consistency for Monitoring was reported to be $\alpha. = 79$ and $\alpha = .75$ respectively and Blunting was reported to be $\alpha. = 69$ and $\alpha = .67$ respectively (Miller, 1987). Internal consistency for the total test has been reported to be $\alpha = .39$ (Muris, van Zuren, de Jong, de Beurs, & Hanewald, 1994) or not reported (Parker & Endler, 1992).

*Validity*

The scale attempts to measure two constructs: "Information seekers" (i.e., Monitors) and "distractors" (i.e., Blunters) (Miller, 1987). The constructs appear to be somewhat independent. Studies show negative and positive correlations between the

constructs $r$ = -0.41 (Miller, 1987) $r$ = -0.29 (Muris et al., 1994), $r$ = -0.10 (Keinan et al., 2003) $r$ = -0.03 (Ben-Zur, 2002) and $r$ = 0.42 (Miró, 1997). The scale has shown predictive validity such as whether an individual wants information prior to receiving an electrical shock (Miller, 1987), whether an individual wants prior information about a scheduled medical procedure (Parker & Endler, 1992) and whether an individual wants information (how much and what type) during a terrorist attack (Keinan et al., 2003). As mentioned previously, the MBSS also had predictive validity in terms of who would develop PTSD symptoms after a terrorist attack (Keinan et al., 2003).

**Statistical Analyses**

The entire sample was included given the constraints of the archived data set. Individuals who were missing variables were included for analyses that did require missing data values. For example, when calculating the mean of the PCL, an individual who did not identify their religious preference was included in the analysis. Missing data needed for analyses was analyzed to determine if the data were missing completely at random using "Little" Missing Completely at Random (LMCAR) SPSS test. After determining there were no significant differences using LMCAR ($\chi^2$ = 1533.08; $p$ = .70), Expectation-Maximum algorithm was used to calculate single imputation. Demographic data or other variables that were not appropriate for inputation were excluded. All calculations were conducted after single inputation (SPSS, 2012).

*Goals*

1) To report physical proximity, social proximity, and media exposure about this sample in terms of percentages and when appropriate means and standard deviations. Evaluation of the archived data set demonstrated little variability. Therefore, this information will be presented categorically.
2) To determine the mean and standard deviation of the IES, PCL, and MBSS in this sample, to report internal consistency for the IES and PCL, and to explore the underlying constructs (i.e., latent variables) of the IES and PCL in this sample (Hoyle, 1999). Exploratory factor analyses were conducted using SPSS extraction method Maximum likelihood to determine the "best-fit" model and factor structure in this sample (SPSS, 2012).

3) To determine if social proximity, physical proximity, media exposure, age, gender, race, and stress coping styles contribute to PTSD-like symptoms (subclinical) as measured by the IES or PCL as continuous variables.

    Eight multiple regressions were performed using five constant predictors per regression and one "novel" predictor per regression. The constant predictors in all regressions were gender, race (white-Hispanic or not white-Hispanic), Monitor coping style, Blunting coping style and age. The novel predictors were social proximity (lose someone or did not lose someone), physical proximity (in NYC or out of NYC), live media exposure (yes or no) and multiple replays (yes or no). For each regression, six predictors (i.e., the five constants and the one "novel") were used to determine if they predicted PTSD-like (subclinical) symptoms using the IES or PCL as continuous variables. The focus on white-Hispanic (Blanchard et al., 2004), social proximity, physical proximity and media exposure was based on 9/11 NYC literature (Neria et al., 2011).

    Gender, race, Monitor coping style, and Blunting coping style were used as predictors and moderators in the regressions to determine if there were interaction effects (i.e., to determine if subgroups emerged that might otherwise be masked). For social exposure, the predictor variable was losing someone you knew (i.e., immediate family, close relative, or acquaintance/co-worker). For interaction effects, only social exposure was modified to limit the interaction to losing a family member (i.e., immediate family or close relative). All continuous variables were mean centered (i.e., age, Monitoring, and Blunting). All other variables were dummy coded.

4) To determine the prevalence of PTSD-like (subclinical) symptoms in this population using a recommended cutoff score for the IES and PCL. A score of 35 or higher will be considered PTSD-like (subclinical) for the IES. Horowitz et al. (1979) said a score of 19 or higher should indicate clinical concern. A score of 35 or higher has demonstrated the greatest sensitivity and the lowest misclassification in clinical populations (Neal et al., 1994; Wohlfarth et al., 2003). Therefore, I created three subgroups for the IES: IES Group One (score = 0-18), IES Group Two (score = 19-34) and IES Group Three (score = 35+).

For the PCL, the VA National Center for PTSD recommends cutoff point scores based on estimated population prevalence. For population prevalence estimates that are 15% or below, a cutoff point of 30-35 is recommended (e.g., general population, civilian primary care, etc.). For population prevalence estimates that are 16%-39% (e.g., TBI clinics, pain clinics or VA primary care), the cutoff point is recommended to be 36-44. The VA National Center for PTSD recommends using the lower of a range for screening for PTSD and using the higher end of a range for aiding in diagnosis. The VA National Center for PTSD considers a score of 44+ to be at very high risk for PTSD and a score of 50+ to be diagnostic of PTSD. Therefore, I created six subgroups for the PCL: PCL Group One (score = 17-29), PCL Group Two (score = 30-35), PCL Group Three (score = 36-44), PCL Group Four (score = 45-49), PCL Group Five (44+) and PCL Group Six (50+). Most of the research using NYC "high risk individuals" used cutoff scores of 44 or 50 (Neria et al., 2011). Therefore, the last two groups are consistent with most of the research using NYC high-risk populations. However, the timing of the administration of the PCL in this sample will make comparisons difficult or not possible. Most studies that measured PTSD-like symptoms with the PCL administered the PCL after the required one-month Criterion established by the DSM-IV and most researchers did not get to populations until much later. Many longitudinal studies found PTSD symptoms lowered over time although there were exceptions (e.g., NYC retired fire fighters) (Neria et al., 2011) and over the last 10-14 years, the populations were highly variable. For example, PTSD increased earlier (i.e., the first few months) and then declined, again, with exceptions (Neria et al., 2011). Unfortunately, the time of administration of the PCL is unknown in this population but the range of 10-30 days is known. Whether there were differences in the number of people who were administered the survey over the 20 days is unknown. However, one interesting aspect about the archived data set is that the PCL is the only validated measure that a large percentage of the sample did not respond to any of the questions. This might be because the measure was initially included and then removed (perhaps because of time burden) or it could have been introduced later in the administration process.

Unfortunately, this information is also not known but the fact that 21% of the sample did not respond to any of the questions of the PCL compared to other validated measures leads to speculation that one of the above scenarios may have occurred.

The VA National Center for PTSD recommends combining scoring methods (cutoff scores and DSM-IV-TR criteria B, C, and D) for optimal specificity, although sensitivity is sacrificed. Therefore, individuals who scored 44 or higher and 50 or higher who also met DSM-IV-TR criteria B, C and D (American Psychiatric Association, 2000) will be noted. Again, these recommendations are based on the VA National Center for PTSD ("PTSD Checklist [PCL]," 2012).

# CHAPTER 3. RESULTS

## Results for Proposed Goal 1.

*Physical proximity.*

Sixty-four (64.7%) indicated they were not in the NYC area during the attack, 29 (29.3%) indicated they were in the NYC area during the attack (two individuals were fairly close indicating they were near the Empire State Building on 34th street), and six (6.1%) did not indicate their location.

*Social proximity.*

In terms of social proximity, one person indicated he/she was physically hurt by the attack (1.0%), three (3.0%) indicated they lost immediate family, five (5.1%) indicated they lost a close relative, 14 (14.1%) indicated they lost an acquaintance or co-worker, 69 (69.7%) indicated they did not lose anyone they knew, and seven (7.1%) did not respond.

*Media exposure.*

In terms of media exposure, 58 (58.6%) indicated they saw a replay of the events, 29 (29.3%) indicated they watched multiple replays of the events, six (6.1%) indicated they watched it "live" while it was occurring and six (6.1%) did not indicate.

For a descriptive view, please refer to Table 2 below. Table 2 shows the Cross-tabulations matrix between social and physical proximity and it also includes the type of media exposure individuals selected on the survey questionnaire.

Table 2. Cross-tabulations of social proximity and physical proximity.

| **Social Physical Media** | Social Physically Hurt | Social Lost Immediate Family | Social Lost Close Relative | Social Lost Acquaintance or Co-worker | **Total Physical Media** |
|---|---|---|---|---|---|
| In NYC **Media** | | 2% (*n* = 2) | 2% (*n* = 2)* | 4% (*n* = 4) | **8%** (*n* = 8) |
| | | R=2 | R=1 M=1 | R=2 M=2 | R=5 M=3 |
| Out of NYC **Media** | 1% (*n* = 1) | 1% (*n* = 1) | 3% (*n* = 3) | 10% (*n* = 10) | **15%** (*n* = 15) |
| | R=1 | R=1 | R=3 | L=1 R=7 M=1 DK=1 | L=1 R=12 M=1 DK=1 |
| **Total Social Media** | **1%** (*n* = 1) | **3%** (*n* = 3) | **5%** (*n* = 5) | **14%** (*n* = 14) | **23%** (*n* = 23) |
| | R=1 | R=3 | R=4 M=1 | L=1 R=9 M=3 DK=1 | L=1 R=17 M=4 DK=1 T=23 |

Note: * Indicates individual was near the Empire State Building (34th street). Type of media exposure is indicated with a L, R, M, or DK. L = watched the events "live." R = watched replay. M = watched multiple replays. DK = no response was given. T = Total. Numbers that follow media exposure labels indicate the number of people in that cell who chose that media response on the survey questionnaire.

**Results for Proposed Goal 2: The IES and the PCL.**

*The IES.*

The mean of the IES was 27.33 (S.D. = 11.54, $n = 99$, $\alpha = .86$). The IES purports to measure two constructs (i.e., intrusion and avoidance) (Horowitz et al., 1979). The mean for purported intrusive items (i.e., items 1, 4, 5, 6, 9, 11 and 14) was 14.13 (S.D. = 6.03, $n = 99$, $\alpha = .79$). The mean for purported avoidant items (i.e., items, 2, 3, 7, 8, 10, 12, 13, and 15) was 13.18 (S.D. = 6.92, $n = 99$, $\alpha = .80$). The correlation between purported intrusion questions and avoidant questions was $r = .59$. After conducting an exploratory factor analysis of the IES 15-item questionnaire, reliabilities were conducted for "latent variables" in the study sample population ($n = 99$). The first factor, which is very similar to the purported "intrusive" factor (i.e., items 1, 4, 5, 6, 7, 9, 11, 12 and 14), had a mean of 17.70 (S.D. 7.53, $n = 9$ items, $\alpha = .82$). The second factor, which is very similar to the purported "avoidance" factor (i.e., items, 2, 3, 8, 10, 13, and 15), had a mean of 9.61 (S.D. 5.70, $n = 6$ items, $\alpha = .80$) (see Appendix F for IES reliability information, Tables 15-19).

*Exploratory Factor Analysis of the IES.*

Using SPSS Exploratory Factor Analysis with Maximum Likelihood, rotation method Promax with Kaiser Normalization, the rotation converged in three iterations revealing a two-factor solution as the "best fit" for the IES (15 items; $n = 99$). The Promax rotation method yielded three eigenvalues greater than one. The first factor was substantially higher than the second factor but the third factor was only marginally higher than that for proximal factors (eigenvalues for the first five items were 5.21, 1.82, 1.13, .98, and .89, respectively). Examination of the scree plot clearly supported a two-factor solution (see Figure 4). The first factor accounted for 37.72 % of the total variance (i.e., items 1, 4, 5, 6, 7, 9, 11, 12, and 14). The second factor accounted for 12.14% of the total variance (i.e., items 2, 3, 8, 10, 13 and 15). All of the IES intrusion items loaded on factor one (as well as item 7, "I felt as if it hadn't happened or it wasn't real" and item 12, "I was aware that I still had a lot of feelings about it but didn't deal with them"). All of the avoidance items (except item 7 and item 12) loaded on the second factor. The mean for factor one (i.e., items 1, 4, 5, 6, 7, 9, 11, 12, and 14) in this sample was 17.7 (S.D. = 7.53, $n = 99$, $\alpha = .82$). The mean for factor two (i.e., items 2, 3, 8, 10, 13 and 15) was 9.61 (S.D. = 9.61, $n = 99$, $\alpha = .80$). The correlation between the two factors was $r = .51$. (see Appendix F for IES EFA information, Tables 20-23).

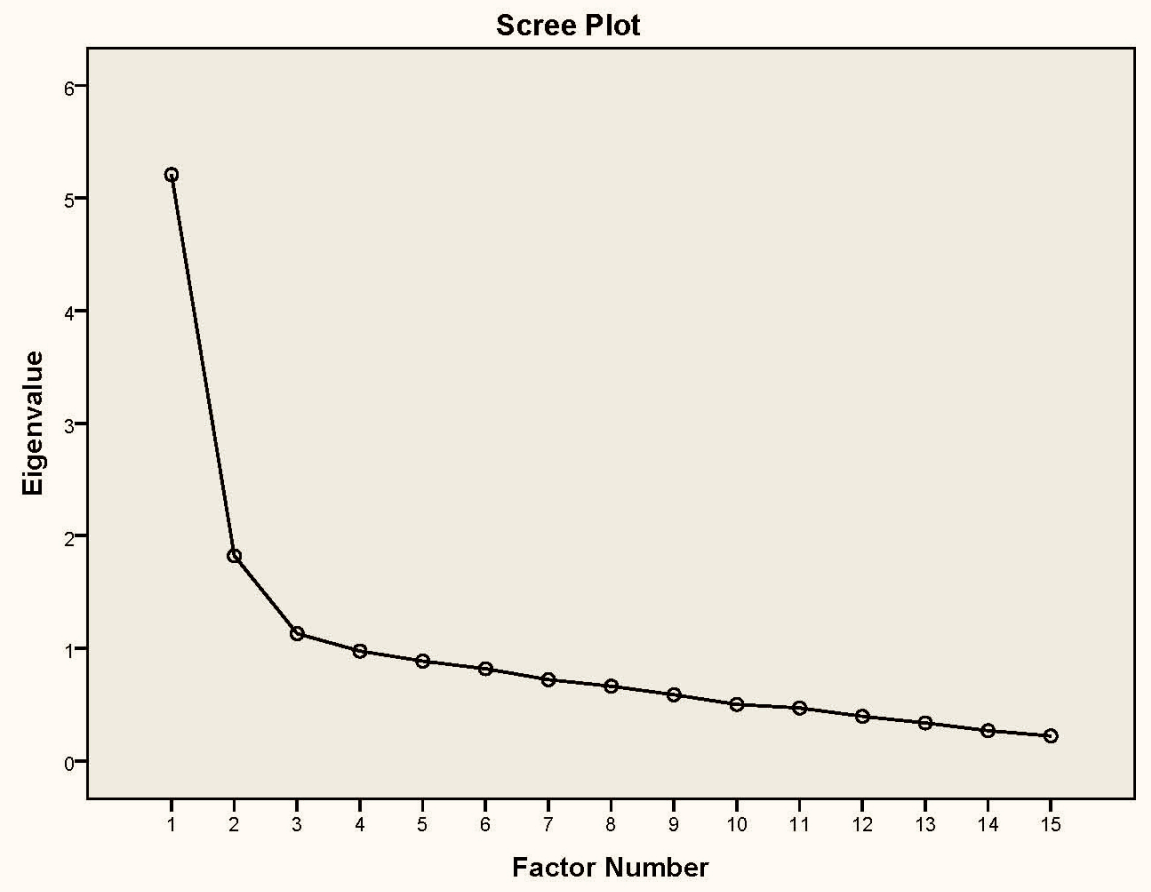


Figure 4. EFA: IES scree plot for the sample ($n$ = 99).

*The PCL.*

The mean of the PCL was 33.59 (S.D. = 13.67, $n$ = 99, $\alpha$ = .92). The PCL purports to measure three factors (i.e., criteria B, C, and D). The mean of "re-experiencing" questions (items 1-5; Criterion B) was 10.64 (S.D = 4.24, $n$ = 5 items, $\alpha$ = .76). The mean for avoidance (items 6-12; Criterion C) was 13.61 (S.D = 6.56, $n$ = 7 items, $\alpha$ = .86). The mean of hyper-arousal questions (items 11-17; Criterion D) was 9.91 (S.D. = 4.79, $n$ = 5 items, $\alpha$ = .83). The correlations between Criterion B, C, and D were $r$ = .71, $r$ = .68 and $r$ = .79 respectively (see Table 3 and see Appendix F for PCL reliability information, Tables 34-40).

Table 3. Correlations for the PCL DSM-IV-TR criteria B, C and D.

| PCL Matrix | Criterion B | Criterion C | Criterion D |
|---|---|---|---|
| Criterion B | 1.0 | .708** | .681** |
| Sig. (2-tailed) | | .000 | .000 |
| N | 99 | 99 | 99 |
| Criterion C | .708** | 1.0 | .792** |
| Sig. (2-tailed) | .000 | | .000 |
| N | 99 | 99 | 99 |
| Criterion D | .681** | .792** | 1.0 |
| Sig. (2-tailed) | .000 | .000 | |
| N | 99 | 99 | 99 |

Note: The matrix shows the correlation of each DSM-IV-TR Criterion (B, C and D) to each other.

*Exploratory Factor Analysis of the PCL.*

Using SPSS Exploratory Factor Analysis with Maximum Likelihood, one factor was extracted from four iterations revealing a one-factor solution as the "best fit" for the PCL (17 items; $n = 99$). Because one factor was extracted no rotation was used. Factor 1 had an eigenvalue of 7.82, which accounted for 46.01 percent of the total variance. Two other eigenvalues were greater than one. The first factor was substantially higher than the second factor and the third factor. The eigenvalues for the second and third factor were only marginally higher than that for proximal factors (eigenvalues for the first five items were 7.82, 1.43, 1.20, .96, and .93). Examination of the scree plot clearly supported a one-factor solution (i.e. the first factor looks like the upper part of an arm and the second factor looks like an elbow that initiates a horizontal plane for all subsequent factors) (see Figure 5). To be comprehensive, a second factor and third factor solution were conducted using Promax with Maximum likelihood and both models encountered one or more communalities greater than one during iterations, supporting the one-factor solution for the PCL in this sample ($n = 99$). Internal consistency was $\alpha = .92$ (see Appendix F for PCL EFA information, Tables 41-43).

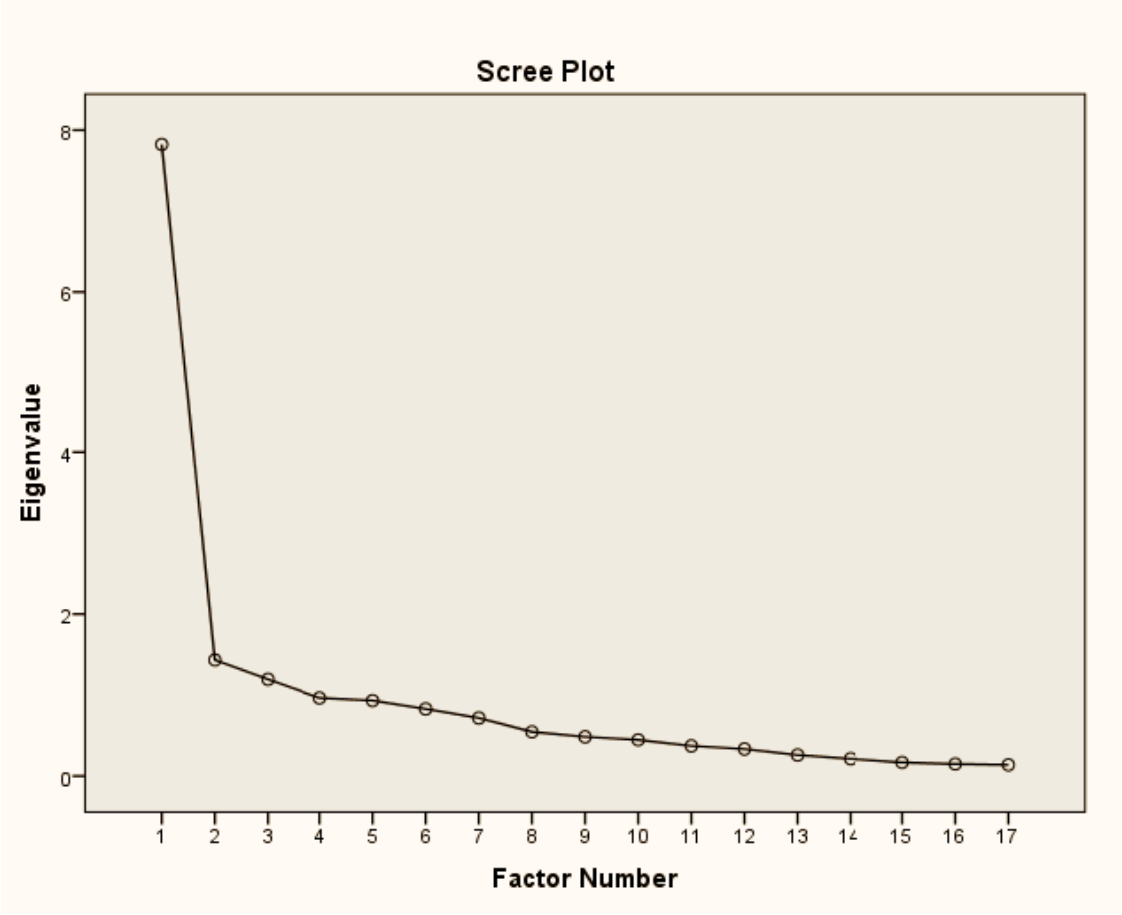


Figure 5. PCL Exploratory Factor Analysis: scree plot for the sample ($n$ = 99).

*The MBSS.*

The mean, standard deviation and internal consistencies for Monitoring and Blunting were calculated using total scores for each of the four scenarios (the data set did not have individual item scores for each scenario). The MBSS Monitoring mean was 8.35 (S.D. = 3.29, $n$ = 99, $\alpha$ = .61, $N$ = 4). The MBSS Blunting mean was 3.73 (S.D. = 2.12, $n$ = 99, $\alpha$ = .39, $N$ = 4). The correlation between Monitoring and Blunting was $r$ = .57 (see Appendix F for MBSS reliability information, Tables 30-33).

**Results of Proposed Goal 3: Multiple regressions with the IES and the PCL.**

Eight multiple regression analyses were conducted to determine if six predictors predicted acute stress reactions as measured by the IES or PCL as continuous variables (four regressions used the IES as the dependent variable and four used the PCL as the dependent variable). Five predictors were in all regressions (i.e., gender, race [white-Hispanic or not], Monitoring coping style, Blunting coping style and age). The additional

predictors were used in two regressions (i.e., when the dependent variable was the IES and when the dependent variable was the PCL). The additional predictors were social proximity (loss of someone you knew), physical proximity (in NYC or not in NYC), live media (yes or no) or watching multiple media replays. Each regression included four moderators (gender, race, Monitoring coping style, and Blunting coping style) with a novel predictor (e.g., social proximity, physical proximity, etc.). For the social proximity regression, the interaction effect with the moderators was defined as losing an immediate family member or a close relative.

*Social proximity and the PCL.*

Social proximity (losing someone the individual knew) was the novel predictor with the five constant predictors (i.e., gender, race [white-Hispanic or not], Monitoring coping style, Blunting coping style and age) using the PCL as a continuous dependent variable. The moderators were gender, white-Hispanic, Monitoring coping style, and Blunting coping style although for interaction purposes, social proximity included individuals who only lost close relatives. There was a main effect for white-Hispanic, $p = .010$ (B = 9.081, S.E. = 3.440, Beta = .303, $t = 2.640$) (see Table 4). No other main effects or interactions were found. For Model 2, $R^2 = .124$, Adjusted $R^2 = .016$, and the Standard Error of Estimate = 14.113.

Table 4. Constant predictors and social proximity with the PCL as the DV.

| Model 2 | Unstandardized Coefficients | | Standardized Coefficients | *t* | Sig |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Constant | 28.740 | 3.272 | | 8.784 | .000 |
| Lost Someone | 3.586 | 3.987 | .1081 | .900 | .371 |
| Gender | 1.722 | 3.464 | .055 | .497 | .621 |
| White-Hispanic | 9.081 | 3.440 | .303 | 2.640 | .010 |
| Monitoring | .456 | .478 | .107 | .955 | .342 |
| Blunting | -.078 | .790 | -.012 | -.098 | 9.22 |
| Age | -.168 | .149 | -.124 | -1.121 | 2.65 |
| Lost Family X Gender | 9.631 | 11.122 | .139 | .866 | .389 |
| Lost Family X Monitoring | -.239 | 1.828 | -.018 | -.131 | .896 |
| Lost Family X Blunting | .666 | 1.933 | .047 | .345 | .731 |
| Lost Family X White-Hispanic | -.2391 | 11.769 | -.030 | -.203 | .840 |

Note: Lost someone = 1, Lost no one = 0; Female = 1, Male = 0; White-Hispanic = 1, Everyone else = 0; Age, Monitoring and Blunting were mean centered. For interactions Lost family = 1, Lost co-worker, acquaintance or no one = 0. Overall Model 2 tests: $F(10, 81) = 1.149$, $p = .010$, $R^2 = .124$.

*Social proximity and the IES.*

Social proximity (losing someone the individual knew) was the novel predictor with the five constant predictors (i.e., gender, race [white-Hispanic or not], Monitoring coping style, Blunting coping style and age) using the IES as a continuous dependent variable. The moderators were gender, white-Hispanic, Monitoring coping style, and Blunting coping style although for interaction purposes, social proximity included individuals who only lost close relatives. There was a main effect for Monitoring coping style, $p = .000$ (B = 1.473, S.E. = 3.57, Beta = .431, $t = 4.127$) and there was a main effect for age, $p = .037$ (B = -.237, S.E. = .112, Beta = -.218, $t = -2.118$) (see Table 5). No other main effects or interactions were found. For Model 2, $R^2 = .234$, Adjusted $R^2 = .140$, and the Standard Error of Estimate = 10.548.

Table 5. Constant predictors and social proximity with the IES as the DV.

| Model 2 | Unstandardized Coefficients | | Standardized Coefficients | t | Sig |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Constant | 26.407 | 2.455 | | 10.798 | .000 |
| Lost Someone | -.090 | 2.980 | -.003 | -.030 | .976 |
| Gender | .572 | 2.589 | .023 | .221 | .826 |
| White-Hispanic | 1.417 | 2.571 | .059 | .551 | .583 |
| Monitoring | 1.473 | .357 | .431 | 4.127 | .000 |
| Blunting | .651 | .591 | .124 | 1.103 | .273 |
| Age | -.237 | .112 | -.218 | -2.118 | .037 |
| Lost Family X Gender | 8.834 | 8.313 | .159 | 1.063 | 2.91 |
| Lost Family X Monitoring | -.574 | 1.366 | -.054 | -.420 | .675 |
| Lost Family X Blunting | .529 | 1.445 | .046 | .366 | .715 |
| Lost Family X White-Hispanic | -.477 | 8.797 | -.007 | -.051 | .960 |

Note: Lost someone = 1, Lost no one = 0; Female = 1, Male = 0; White-Hispanic = 1, Everyone else = 0; Age, Monitoring, and Blunting were mean centered. For interactions Lost family = 1, Lost co-worker, acquaintance or no one = 0. Overall Model 2 tests: $F(10, 81) = 2.478$, Monitoring $p = .000$, age $p = .037$, $R^2 = .124$.

*Physical proximity and the PCL.*

Physical proximity (in NYC or out of NYC) was the novel predictor with the five constant predictors (i.e., gender, race [white-Hispanic or not], Monitoring coping style, Blunting coping style and age) using the PCL as a continuous dependent variable. The moderators were gender, white-Hispanic, Monitoring coping style, and Blunting coping style. No main effects or interactions were found although white-Hispanic was close ( $p = .075$) for a main effect. For Model 2, $R^2 = .090$ and Adjusted $R^2 = -.021$, and the Standard Error of Estimate = 14.256

*Physical proximity and the IES.*

Physical proximity (in NYC or out of NYC) was the novel predictor with the five constant predictors (i.e., gender, race [white-Hispanic or not], Monitoring coping style, Blunting coping style and age) using the IES as a continuous dependent variable. The moderators were gender, white-Hispanic, Monitoring coping style, and Blunting coping style. There was a main effect for Monitoring coping style $p = .000$ (B = 1.794, S.E. = .423, Beta = .514, $t = 4.241$) (see Table 6). No other main effects or interactions were found although being in NYC was close to having a main effect ( $p = .076$) and there was

a close interaction effect between being female and being in NYC ( $p$ = .068). For Model 2, $R^2$ = .276, Adjusted $R^2$ = .188, and the Standard Error of Estimate = 10.523.

Table 6. Constant predictors and physical proximity with the IES as the DV.

| Model 2 | Unstandardized Coefficients | | Standardized Coefficients | $t$ | Sig |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Constant | 29.642 | 2.765 | | 10.721 | .000 |
| In NYC | -8.60 | 4.825 | -.346 | -1.799 | .076 |
| Gender | -2.485 | 3.019 | -.096 | -.823 | .413 |
| White-Hispanic | -.608 | 3.122 | -.025 | -.195 | .846 |
| Monitoring | 1.794 | .423 | .514 | 4.241 | .000 |
| Blunting | .325 | .607 | .060 | .536 | .593 |
| Age | -.144 | .117 | -.127 | -1.227 | .233 |
| NYC X Gender | 10.167 | 5.493 | .366 | 1.851 | .068 |
| NYC X White-Hispanic | 4.501 | 5.140 | .134 | .876 | .384 |
| NYC X Monitoring | -1.081 | .723 | -.174 | -1.408 | .163 |
| NYC X Blunting | 1.617 | 1.193 | .150 | 1.355 | 1.79 |

Note: In NYC = 1, Out of NYC = 0; Female = 1, Male = 0; White-Hispanic = 1, Everyone else = 0; Age, Monitoring, and Blunting were mean centered. Overall Model 2 tests: $F(10, 82) = 3.126$, Monitoring $p$ = .000, $R^2$ = .276.

*Live media and the PCL.*

Watching "live" media (i.e., watching the events as they were occurring on T.V.) was the novel predictor with the five constant predictors (i.e., gender, race [white-Hispanic or not], Monitoring coping style, Blunting coping style and age) using the PCL as a continuous dependent variable. The moderators were gender, white-Hispanic, Monitoring coping style, and Blunting coping style. There was a main effect for white-Hispanic, $p$ = .006 (B = 9.153, S.E. = 3.261, Beta = .305, $t$ = 2.807) (see Table 7). No other main effects or interactions were found. For Model 2, $R^2$ = .137 and Adjusted $R^2$ = .032, and the Standard Error of Estimate = 13.974.

Table 7. Constant predictors and live media with the PCL as the DV.

| Model 2 | Unstandardized Coefficients | | Standardized Coefficients | *t* | Sig |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Constant | 30.707 | 3.087 | | 9.947 | .000 |
| Live Media | -3.937 | 27.431 | -.068 | -.144 | .886 |
| Gender | .831 | 3.384 | .026 | .246 | .807 |
| White-Hispanic | 9.153 | 3.261 | .305 | 2.807 | .006 |
| Monitoring | .206 | .458 | .049 | .449 | .654 |
| Blunting | .192 | .704 | .029 | .272 | .786 |
| Age | -.236 | .151 | -.172 | -1.563 | .122 |
| Live Media X Gender | 23.961 | 24.115 | .344 | .994 | .323 |
| Live Media X Blunting | -6.844 | 4.980 | -.220 | -1.347 | .173 |
| Live Media X Monitoring | .592 | 3.830 | .035 | .154 | .878 |
| Live Media X White-Hispanic | .579 | 21.372 | .004 | .027 | .978 |

Note: Live media = 1, Other = 0; Female = 1, Male = 0; White-Hispanic = 1, Everyone else = 0; Age, Monitoring, and Blunting were mean centered. Overall Model 2 tests: $F(10, 82) = 1.301$, White-Hispanic $p = .006$, $R^2 = .137$.

*Live Media and the IES.*

Watching "live media" (i.e., watching the events as they occurred on T.V.) was the novel predictor with the five constant predictors (i.e., gender, race [white-Hispanic or not], Monitoring coping style, Blunting coping style and age) using the IES as a continuous dependent variable. The moderators were gender, white-Hispanic, Monitoring coping style, and Blunting coping style. There was a main effect for Monitoring coping style, $p = .000$ (B = 1.428, S.E. = .359, Beta = .412, $t = 3.973$) (see Table 8). No other main effects or interactions were found although there was a close main effect for age $p = .086$. For Model 2, $R^2 = .212$ and Adjusted $R^2 = .116$, and the Standard Error of Estimate = 10.960.

Table 8. Constant predictors and live media with the IES as the DV.

| Model 2 | Unstandardized Coefficients | | Standardized Coefficients | *t* | Sig |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Constant | 26.572 | 2.421 | | 10.975 | .000 |
| Live Media | -9.188 | 21.514 | -.195 | -.427 | .670 |
| Gender | .559 | 2.654 | .022 | .211 | .834 |
| White-Hispanic | 1.898 | 2.558 | .077 | .742 | .460 |
| Monitoring | 1.428 | .359 | .412 | 3.973 | .000 |
| Blunting | .616 | .552 | .114 | 1.115 | .268 |
| Age | -.206 | .118 | -.183 | -1.739 | .086 |
| Live Media X Gender | 11.450 | 18.913 | 200 | .605 | .547 |
| Live Media X Blunting | -.693 | 3.905 | -.027 | -.177 | .860 |
| Live Media X Monitoring | -1.983 | 3.004 | -.142 | -.660 | .511 |
| Live Media X White-Hispanic | -7.896 | 16.761 | -.070 | -.471 | .639 |

Note: Live media = 1, Other = 0; Female = 1, Male = 0; White-Hispanic = 1, Everyone else = 0; Age, Monitoring, and Blunting were mean centered. Overall Model 2 tests: $F(10, 82) = 2.208$, Monitoring $p = .000$, $R^2 = .212$.

*Multiple replays and the PCL.*

Watching "multiple replays" (i.e., watching the events on T.V multiple times) was the novel predictor with the five constant predictors (i.e., gender, race [white-Hispanic or not], Monitoring coping style, Blunting coping style and age) using the PCL as a continuous dependent variable. The moderators were gender, white-Hispanic, Monitoring coping style, and Blunting coping style. There was a main effect for white-Hispanic $p = .029$ (B = 8.410, S.E. = 3.773, Beta = .279, $t = 2.229$) (see Table 9). No other main effects or interactions were found. For Model 2, $R^2 = .130$ and Adjusted $R^2 = .025$, and the Standard Error of Estimate = 14.056.

Table 9. Constant predictors and multiple replays with the PCL as the DV.

| Model 2 | Unstandardized Coefficients | | Standardized Coefficients | *t* | Sig |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Constant | 30.764 | 3.555 | | 8.653 | .000 |
| Multiple Replays | -3.913 | 6.690 | -.128 | -.585 | .560 |
| Gender | 3.074 | 3.922 | .097 | .784 | .435 |
| White-Hispanic | 8.410 | 3.773 | .279 | 2.229 | .029 |
| Monitoring | .083 | .562 | .020 | .148 | .882 |
| Blunting | .230 | .808 | .035 | .284 | .777 |
| Age | -.167 | .148 | -.122 | -1.126 | .263 |
| Replays X Blunting | -1.059 | 1.704 | -.085 | -.622 | .536 |
| Replays X Monitoring | .986 | .958 | .140 | 1.029 | .306 |
| Replays X White-Hispanic | -4.589 | 7.583 | -.090 | -.605 | .547 |
| Replays X Gender | -.602 | 7.583 | -.018 | -.080 | .936 |

Note: Multiple replays = 1, Other = 0; Female = 1, Male = 0; White-Hispanic = 1, Everyone else = 0; Age, Monitoring, and Blunting were mean centered. Overall Model 2 tests: $F(10, 83) = 1.242$, White-Hispanic $p = .029$, $R^2 = .130$.

*Multiple replays and the IES.*

Watching "multiple replays" (i.e., watching the events on T.V multiple times) was the novel predictor with the five constant predictors (i.e., gender, race [white-Hispanic or not], Monitoring coping style, Blunting coping style and age) using the IES as a continuous dependent variable. The moderators were gender, white-Hispanic, Monitoring coping style, and Blunting coping style. There was a main effect for Monitoring coping style, $p = .002$ (B = 1.397, S.E. = .433, Beta = .405, $t = 3.226$) (see Table 10). No other main effects or interactions were found although there was a close main effect for age $p = .089$. For Model 2, $R^2 = .224$ and Adjusted $R^2 = .130$, and the Standard Error of Estimate = 10.823.

Table 10. Constant predictors and multiple replays with the IES as the DV.

| Model 2 | Unstandardized Coefficients | | Standardized Coefficients | *t* | Sig |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Constant | 26.588 | 2.737 | | 9.713 | .000 |
| Multiple Replays | -1.451 | 5.152 | -.058 | -.282 | .779 |
| Gender | .293 | 3.020 | .011 | .097 | .923 |
| White-Hispanic | 1.591 | 2.905 | .065 | .548 | .585 |
| Monitoring | 1.397 | .433 | .405 | 3.226 | .002 |
| Blunting | .995 | .623 | .185 | 1.598 | .114 |
| Age | -.196 | .114 | -.175 | -1.722 | .089 |
| Replays X Blunting | -1.948 | 1.312 | -.191 | -1.484 | .141 |
| Replays X Monitoring | .233 | .738 | .041 | .316 | .753 |
| Replays X White-Hispanic | -3.633 | 5.839 | -.088 | -.622 | 5.36 |
| Replays X Gender | 4.253 | 5.791 | .153 | .734 | .465 |

Note: Multiple replays = 1, Other = 0; Female = 1, Male = 0; White-Hispanic = 1, Everyone else = 0; Age, Monitoring, and Blunting were mean centered. Overall Model 2 tests: $F(10, 83) = 2.389$, Monitoring $p = .002$, $R^2 = .224$.

An overview of the significant predictors using the IES and the PCL can be seen in Table 11 and Table 12 respectively.

Table 11. Significant predictors with the IES as the DV: Monitoring and Age.

| IES ($n = 99$) | Social Proximity | Physical Proximity | Live Media Exposure | Multiple Replays |
|---|---|---|---|---|
| Monitoring | $p = .000$ | $p = .000$ | $p = .000$ | $p = .002$ |
| Age | $p = .037$ | NS | NS | NS |

Note: The main constant predictors in each model were age, gender, race, Monitoring coping style and Blunting coping style.

Table 12. Significant predictors with the PCL as the DV: White-Hispanic.

| PCL ($n = 99$) | Social Proximity | Physical Proximity | Live Media Exposure | Multiple Replays |
|---|---|---|---|---|
| White Hispanic ($n$=33) | $p = .010$ | NS | $p = .006$ | $p = .029$ |

Note: The main constant predictors in each model were age, gender, race, Monitoring coping style and Blunting coping style.

**Results of Proposed Goal 4.**

*Total scores of the IES.*

In this population (*n* = 99), 23.2% (*n* = 23) participants scored below 19; 50.5% (*n* = 50) participants scored between 19 and 34; and 26.3% (*n* = 26) participants scored 35 or higher.

Table 13. Mercy College scores on the IES.

| IES | IES Score: 0-18 | IES Score: 19-34 | IES Score 35+ |
|---|---|---|---|
| N | 23 | 50 | 26 |
| Percent | 23.2% | 50.5% | 26.3% |
| S.D. | 5.95 | 4.69 | 3.98 |
| Median | 9.0 | 28.0 | 40.5 |

Note: Range of sample: 0-47; Maximum score possible = 60. A score of 19+ indicates clinical concern is warranted. A score of 35+ indicates probable PTSD.

*Total Scores of the PCL and DSM-IV-TR Criteria.*

In this population (*n* = 99), 51.5% (n = 51) scored in Group one (G1), 9.1% (*n* = 9) scored in Group two (G2), 9.1% (*n* = 9) scored in Group three (G3), 12.1% (*n* = 12) scored in Group four (G4), 32.3% (*n* = 32) scored in Group five (G5), and 18.2% (*n* = 18) scored in Group six (G6). Using the DSM-IV-TR (i.e., criteria B, C and D), for G1 (*n* = 51) : 19.2% (*n* = 19) met Criterion B, 0.0% (*n* = 0) met Criterion C, 2.0% (*n* = 2) met Criterion D and 0.0% met all criteria. For G2 (*n* = 9): 8.1% (*n* = 8) met Criterion B, 0.0% (*n* = 0) met Criterion C, 2.0% (*n* = 2) met Criterion D and 0.0% met all criteria. For G3 (*n* = 9): 9.1% (*n* = 9) met Criterion B, 5.1% (*n* = 5) met Criterion C, 6.1% (*n* = 6) met Criterion D and 2.0% met all criteria. For G4 (*n* = 12): 10.1% (*n* = 10) met Criterion B, 11.1% (*n* = 11) met Criterion C, 12.1% (*n* = 12) met Criterion D and 10.1% (*n* = 10) met all criteria. For G5 (*n* = 32): 30.3% (*n* = 30) met Criterion B, 30.3% (*n* = 30) met Criterion C, 31.3% (*n* = 31) met Criterion D and 27.3% (n = 27) met all criteria. For G6 (*n* = 18): 18.2% (*n* = 18) met Criterion B, 17.2% (*n* = 17) met Criterion C, 18.2% (*n* = 6) met Criterion D and 17.2% (*n* = 17) met all criteria (see Table 14).

Table 14. Total scores of Groups 1- 6 and DSV-IV-TR criteria for the PCL.

| PCL | | Statistics | | | | | DSM-IV-TR Criteria | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Group | *n* | Mean | S.D. | Range | Mode | Median | B | C | D | Met All |
| G1: 17-29 | 51 | 22.31 | 3.94 | 17-29 | 19 | 23.0 | 19 | 0 | 2 | 0 (*n* = 51) |
| G2: 30-35 | 9 | 32.89 | 1.69 | 30-35 | 33 | 33.0 | 8 | 0 | 2 | 0 (*n* = 9) |
| G3: 36-44 | 9 | 41.44 | 2.30 | 38-44 | 39 | 42.0 | 9 | 5 | 6 | 2 (*n* = 9) |
| G4: 45-49 | 12 | 46.58 | 1.38 | 45-49 | 46 | 46.0 | 10 | 11 | 12 | 10 (*n* =12) |
| G5: 44+ | 32 | 51.94 | 6.40 | 44-69 | 46 | 50.5 | 30 | 30 | 31 | 27 (*n* =32) |
| G6: 50+ | 18 | 56.39 | 4.98 | 50-69 | 57 | 57.0 | 18 | 17 | 18 | 17 (*n* = 18) |

Note: A score of 30-35 indicates possible PTSD in settings with estimated PTSD prevalence 15% or below; a score of 36-44 indicates possible PTSD in settings with estimated PTSD prevalence of 16%-40%; a score of 45-50 indicates possible PTSD in settings with estimated PTSD prevalence of 40% or higher; a score of 44 or 50 or higher is considered presumptive diagnostic PTSD for civilian and military populations respectively. Combining score cutoff recommendations with DSM-IV-TR criteria is suggested for maximum sensitivity and specificity. (“PCL Handout,” 2012)

# CHAPTER 4. DISCUSSION

The purpose of this study was to assess some of the immediate psychological effects of 9/11 in individuals who attended a NYC metropolitan college 10-30 days after 9/11. General demographic and proximity questions to 9/11 events were assessed; four widely used validated instruments were also included in the survey. Overall, Mercy College statistics of 2001 were compared to the sample to determine if the sample was representative of Mercy College. Three questions were used to assess physical, social, and media exposure. Based on literature from 9/11 and prior PTSD research four goals were proposed. First: to report physical, social, and media exposure in this sample. Second: to determine if the overall mean, standard deviation, internal consistency and exploratory factor analyses produced similar findings based on similar populations, prior PTSD studies, and studies conducted on residents or commuters in NYC. Third: to determine if social proximity, physical proximity, media exposure, age, gender, race, and coping styles contribute to PTSD-like symptoms (subclinical) as measured by the IES and PCL -- eight regressions analyses were performed using media exposure and proximity questions to determine if subgroups emerged with five constant predictors (i.e., age, race, Monitoring coping style, Blunting coping style and gender) using the IES and PCL as continuous dependent variables. Finally, cutoff scores were calculated for the IES and PCL. For the PCL, DSM-IV-TR criteria were used to determine if individuals had subclinical PTSD-like (subclinical) symptoms or cutoff scores that might indicate risk for future PTSD. I start with proximity and media exposure results. I then address the instruments previously validated (i.e., IES, PCL, MBSS) compared to my results in terms of reliability and validity. I then address social proximity, physical proximity and media exposure in conjunction with five main predictors (age, race, Monitoring coping style, Blunting coping style and gender) on the IES and PCL as dependent variables. Recommended cutoff scores for the IES and PCL are discussed for various populations and compared to the results I obtained in this sample. I also incorporate DSM-IV-TR criteria PCL scoring for maximum sensitivity and specificity and compare results to cutoff recommendations in this sample. Limitations of the study are addressed.

**Discussion of Proposed Goal 1**

To report physical proximity, social proximity, and media exposure about this sample in terms of frequency and percentages and when appropriate means and standard deviations. Evaluation of the archived data set demonstrated little variability. Therefore, this information is presented categorically.

*Physical proximity*

In terms of physical proximity, most people were outside the NYC area but a large percentage was in the area (29.3%). Exact locations are not known but two individuals were close indicating they were around the Empire State Building (34th street). One person said he/she was physically hurt by the attack but was outside NYC during the attack. How the individual was injured is unknown but some possibilities are being a responder, commuter, resident, or present during the various outcomes of the attack such as buildings collapsing or smoke, chemical and debris related air quality effects (estimated 2,500 contaminants) that persisted for an extended period of time. ("Health effects arising from the September 11 attacks," 2013). Therefore, the sample includes a range in terms of physical proximity to the WTC but it is unknown if this range is representative of the proportion of NYC residents who were within the vicinity of the WTC.

*Social proximity.*

In terms of social effects, 22 (22.2%) of participants lost someone they knew at the time of the administration of this survey. At whatever time point they took the survey, three (3.0%) knew they lost an immediate family member, 5.1% knew they lost a close relative and 14.1% knew they lost a co-worker or acquaintance. Therefore, this sample includes individuals who may still have been grieving the loss of a loved one or still did not know if they had lost loved ones – the fact that seven (7.1%) left this question unmarked leaves room for speculation. Unfortunately, the construction of the social proximity question had limitations (See Appendix B, item 15). It did not offer important viable choices. For example, you could have lost a close friend or a significant other but no response was provided for these options. If this is the case, it is unclear how individuals would respond to this question. In addition, although the instruction for the

question says mark all that apply, the archived data set did not provide for multiple response allocations. It is possible that more than one of these conditions could have been marked but without the original surveys, this remains an unknown. In addition, individuals could have lost multiple co-workers, multiple close family members, etc. but neither the data set or the question provided a mechanism to communicate this information. Furthermore, the actual confirmation of loss was probably not easily discernable given the time period of survey administration. The biggest predictor of PTSD across 9/11 studies in the New York City area was exposure – particularly and consistently survivors (i.e., individuals who loss significant others) and/or victims of the attacks were strong predictors of PTSD compared to other members in the community (Neria et al., 2011). Again, without knowing the significance of individuals' loss in this sample, it is hard to speculate their risk. We do know the sample is fairly representative of the Mercy College population so response rates to the survey do not indicate a response bias that is overtly obvious. However, an 8.1% loss of close family out of a sample of 99 with 7.1% of individuals not indicating a response is questionable. If we just consider NYC (i.e., Brooklyn, Bronx, Manhattan, Staten Island and Queens) (see Figure 1 and Table 1) that would imply that at least 8.1% of that population lost a close relative if these results were generalizable. The Census Bureau indicates that NYC has a population of a little over 8.3 million. Estimated deaths from 9/11 (not just the WTC) are estimated to be at most 3,000. If 8.1% of NYC lost a close family member, the number of deaths should be substantially higher. Assuming no one shared common close relatives, the estimated death of 8.1% of close family members would be about 675,273. If ten shared a close relative, the number of deaths should be about 33,764. If one hundred shared a close relative, the estimate is about 6,753. Thus, it is unlikely this sample is representative of NYC. It is also possible that the three campuses targeted for the survey are not representative of NYC (at least in terms of number of close relatives who died from 9/11). The acquaintance/co-worker loss question is too broad to even speculate (see Appendix B question 15), however, 14% seems to be similar to other research reported although many studies also focused on individuals who knew people who suffered property damage, job loss, dislocation, injuries, etc. (Galea & Resnick, 2005, Neria et al., 2011; Schlenger et al., 2002; Silver et al., 2002, 2006).

*Media exposure.*

Based on the results, most individuals indicated that they watched a replay of the events (58.6%), six (6.1%) watched the events while they were occurring on T.V., 29 (29.3%) watched multiple replays of the events and six (6.1%) did not indicate. The media question has limitations (see Appendix B, item 14). It is possible that more than one condition could have applied. It's possible that individuals marked they saw "a" replay but really saw more than one. In addition, two choices in the media question (i.e., watching events on T.V. while they were occurring "live" or watching multiple replays of the events) included in the same question were shown to be important separate predictors of PTSD in studies investigating the psychological effects of 9/11 and media (Ahern et al., 2002; Ahern, Galea, Resnick, & Vlahov, 2004; Baschnagel et al., 2009; Bernstein et al., 2007; Blanchard et al., 2004; Galea et al., 2003; Schlenger et al., 2002; Silver et al., 2002; 2005; 2006). Some studies investigated the effects of live viewing and the number of hours of viewing (Silver et al., 2002) while other studies asked about contents viewed (e.g., people jumping) (Schlenger et al., 2002). Silver et al. (2002) in their national study found that 60% *(n* = 520) of their sample reported watching the events "live." Again, because of design limitations of the question and the differences between other study designs, this question is too limited to draw any conclusions, much less compare to other studies that investigated media effects. Please see Table 2 for the relationship between physical proximity, social proximity and media exposure in this sample.

**Discussion of Proposed Goal 2.**

To determine the mean and standard deviation of the IES, PCL, and MBSS (Monitoring and Blunting) in this sample, to report internal consistencies for the IES, PCL and to conduct exploratory factor analyses for the IES and PCL in this sample.

*The IES.*

Horowitz et al. (1979) reported the same internal consistency ($\alpha = .86$) for the total 15-item scale as I found in this sample. Horowitz's sample was 66 people who sought treatment for a serious life-threatening event at a University of California stress treatment center. Approximately half of their sample sought treatment for bereavement while the other half sought treatment for accidents, violence or illness associated events.

They also reported similar internal consistencies for intrusion and avoidance subscales of $\alpha$ = .78, .82, respectively. This sample was $\alpha$ = .82 and .80 respectively. However, in a review of 11 studies by Sundin and Horowitz (2002), they found internal consistency estimates in a range of study populations. They found the mean estimate for intrusion was $\alpha$ = .86 (range = .72-.92) and the mean estimate for avoidance was $\alpha$ = .82 (range = .65-.90). The results in the current study are close to the means they found however, it is clear that the internal consistency of the IES is not consistent over time. Shalev (1992) who used the IES two days, six days, and 14 months after a terrorist attack found combined (i.e., intrusion and avoidance) internal consistency to be $\alpha$ = .78, .73 and .88 respectively (Joseph, 2000). In a non-clinical sample, Thatcher and Kerkorian (2005) found combined internal consistency to be $\alpha$ = .91, intrusion to be $\alpha$ = .89 and avoidance to be $\alpha$ = .85. In the current sample, combined internal consistency was $\alpha$ = .86, which was the mean estimate of the 11 studies Sundin and Horowitz (2002) reviewed. Internal consistency for the intrusive and avoidant items in this sample was $\alpha$ = .82 and $\alpha$ = .80 respectively. Internal consistency seems to vary across studies, which could be due to different types of trauma, times of administrations, population characteristics, etc. Overall, the reliability estimates found in this study suggests that the IES for this sample does not include problematic measurement error.

The correlation between intrusion and avoidance has reported variability. Horowitz et al. (1979), in their initial study, found the correlation between intrusion and avoidance to be $r$ = .41. A review of eleven studies (Sundin & Horowitz, 2002) found the mean correlation to be $r$ = .63. Zilberg (1982) found the correlation between intrusion and avoidance items to be lowest at the earliest assessment ($r$ = .15) but found the two constructs became more correlated over time (last assessment $r$ = .78). In the current study, the correlation between intrusion and avoidant items was $r$ = .68, which is similar to the average previously found by Sundin and Horowitz (2002) in their review of the IES. Therefore, the IES in the present study yielded support for construct validity.

Joseph (2000), who reviewed the IES's reliability and validity made some interesting points. First, he thought the IES should be used because it has been used consistently across many trauma domains and for over twenty years. He also noted that Horowitz designed the measure based on observations of traumatized individuals rather

than designing the instrument to meet DSM criteria, which at the time of the development of the IES, PTSD was not even a DSM disorder. He further stated that the revised edition (i.e., the IES-R), which added questions to incorporate hyper-arousal still kept the old IES intrusion and avoidance scale intact so comparisons with older studies could still be made. He also stated that designing an instrument for DSM criteria was not ideal since so much debate about what PTSD actually constitutes is ongoing and that further DSM criteria in the future is likely to occur. His speculation was correct -- the DSM-5 criteria for PTSD have been modified (American Psychiatric Association, 2013). Aside from the above, he mentioned various factor analyses resulted in mixed results. He noted that in traumatized populations, factor analyses have revealed two, three and four factors. He discussed the various observations based on items and factor loadings but one thing he mentioned that I found interesting was the observation of conscious versus unconscious responses. While Joseph was referring to these in terms of avoidance, I reviewed the scale and marked items that were conscious responses and items that were not conscious responses irrespective if they were intrusive or avoidance. There were two questions I found ambiguous (i.e., items 7 and 15 in Appendix B; although I could see both as being unconscious). What I found was all the items that I marked as unconscious all loaded on factor 1 and all the items I marked as conscious loaded on factor two in my factor analysis. Interestingly, also regarding items 7 and 15, I felt they could measure symptoms of ASD. Item 7 ("I felt it hadn't happened or wasn't real") and item 15 ("My feelings about it were kind of numb") both seem to tap aspects of derealization, detachment, or dissociation. Item 7 loaded strongly on Factor 1 (although it is considered an avoidance item) and item 15 loaded on Factor 2 (this item is considered avoidance but many factor analyses have found a 4$^{th}$ Factor, which most term "emotional numbing" (Asmundson et al., 2004; Conybeare et al., 2012; Joseph, 2000). It should be noted that item 7 loaded strongly on Factor one while item 15 was very weak (i.e., .73 difference). Joseph (2000) clearly demonstrates the pros and cons of the IES. Despite limitations, he states the IES has immense value in the study of PTSD and recommends continued use of the instrument because it has moderate to high correlations with other PTSD measures (e.g., Bryant & Harvey, 1996; Burgess, & Pattison, 1992; Foa et al., 1993; Joseph, 2000; Joseph et al., 1996) and has been significantly predictive of future PTSD (e.g., Creamer,

1992; Joseph, Yule & Williams, 1994, 1995; Joseph et al., 1996; McFarlane, 1992a, 1992b; Perry, Difede, Musngi, Frances, and Jacobsberg, 1992; Shalev, 1992). In fact, he suggests that the IES should be considered as an independent predictor as opposed to a dependent variable based on numerous studies. However, with respect to 9/11, I found no studies that used the IES except in the D.C. area (Grieger, Fullerton, & Ursano, 2003, 2004). Although there has been predictive validity with the IES and future PTSD (Creamer, 1992; Joseph, 2000; Joseph, Yule & Williams, 1994, 1995; Joseph et al., 1996; McFarlane, 1992a, 1992b; Perry, Difede, Musngi, Frances, and Jacobsberg, 1992; Shalev, 1992), results from the IES total scores in this study should be viewed with caution.

*The MBSS*

Consistent with Miller (1987), I found the mean for Monitoring to be higher than the mean for Blunting. In her two experiments she found the mean for Monitoring was 9.70 while the mean for Blunting was 5.57 with respect to receiving a shock. For her cognitive challenge she found the mean for Monitoring to be 11.10 and the mean for Blunting to be 4.55. In my sample, the mean for Monitoring was 8.35 and the mean for Blunting was 3.73. Although I did not have single item scores to conduct a meaningful internal consistency, I did have total scores for teach of the four scenarios for both Monitoring and Blunting. The internal consistency for the four scenarios for Monitoring was $\alpha = .61$ and for Blunting $\alpha = .39$. Despite these limitations, it is interesting to note that Monitoring has higher internal consistency than Blunting, which is consistent with prior research (Keinan et al., 2003). Although prior research has found the correlation between Monitoring and Blunting to range from $r = -.41$ to $r = .42$ (Miro, 1997) in my sample I found the correlation between total scores to be much higher $r = .57$. It is unclear why these correlations have such variability. To my knowledge, the correlation I found is the highest reported and these results clearly bring into question whether these constructs are independent.

*The PCL*

The mean of the scores of the PCL in this sample was 33.59 (S.D. = 13.67, $n = 99$, $\alpha = .92$). Blanchard et al. (2004) focused on university college students in three locations

after 9/11. The universities they sampled were: Albany, New York (*n* = 507); Augusta, Georgia (*n* = 336); and Fargo, North Dakota (*n* = 526). They administered the PCL in the first six to ten weeks after 9/11. PCL means for males and females at Albany were 27.4 (S.D. = 10.2) and 30.0 (S.D. = 11.3) respectively. PCL means for males and females at Augusta were 23.7 (S.D. = 9.2) and 27.2 (S.D. = 8.1) respectively. PCL means for males and females at Fargo were 22.5 (S.D. = 7.3), and 24.4 (S.D. = 8.1) respectively. The mean total (males and females) for Albany was 28.6 (S.D. = 10.8). They then focused on just New York (NY) and looked at students who had physical proximity (i.e., location of permanent home) on 5 levels to the epicenter (i.e., the WTC in NYC) breaking proximity into five levels with each level representing further degrees from the WTC (i.e., Manhattan was considered level one, the next surrounding counties were considered level two, etc.). The five levels were: 1) NYC, 2) Nassau, Westchester, and Rockland, 3) Suffolk, Orange, and Putnam, 4) Dutchess, Ulster, and Sullivan and 5) all other NY counties. In my study, only one campus location was out of NYC (i.e., Dobbs Ferry located in Westchester [level 2]). The means and standard deviations (total for both sexes) for NYC (level 1) and Nassau, Westchester, and Rockland (level 2) were 29.2 (S.D. 10.8; *n* = 96) and 31.1 (S.D.11.7; *n* = 124) respectively. NYC (level 1) and Nassau, Westchester, and Rockland (level 2) were significantly higher than other counties in the state on the PCL (*t* [486] = 3.35, p = 0.010) (Blanchard et al., 2004). Compared to Blanchard et al. (2004), the mean on the PCL in this study was higher (33.59, S.D. = 13.67, *n* = 99). It is interesting to note that they found higher scores on the PCL in level one and level 2 but not other NY county levels. They also found gender differences (i.e., females scored significantly higher on the PCL than men) in their NY and Georgia campus samples but not their North Dakota sample. No evidence was found for gender differences in this sample. This may be due to the limited sample size and/or sample demographic differences. Unfortunately, no comparison can be directly made because of differences in time of administration of the survey. However, what we can gather from this study is that what they term “physical” proximity and what I term as “social” proximity showed increased levels of PTSD-like (subclinical) in their NY sample and in my sample compared to other parts of NY and the country, despite differences in the time of administration of the PCL.

In terms of validity of the PCL and Factor structures, I found similar results to what Conybeare et al. (2012) found in their non-clinical sample of college students. Because Mercy College was not considered "high risk" relative to areas south of Canal Street in NYC, this makes for a somewhat suitable comparison of the validity of the PCL in a similar population. It is interesting to note that even though Conybeare et al. (2012) said non-clinical, they actually had a higher mean than results found in a mixed-trauma college sample (i.e., Adkins et al., 2008). Conybeare et al. (2012) found evidence for both a one-Factor and two-Factor model. If you look at their eigenvalues, I'm not sure why they assumed one or two Factors with the exception that their Factor analysis had one additional Factor that had an eigenvalue greater than 1.0 (i.e., the first five values were 8.26, 1.26, .95, .86, and .74). I found evidence for a one-Factor model with similar eigenvalues. The scree plot was clearly indicative of a one-Factor solution (even though I had an eigenvalue above 1.0 for the second Factor). Why I found a one-Factor solution could be because the measurement was administered so close to 9/11 or because not many individuals evidenced classic PTSD symptom clusters (i.e., DSM-IV-TR criteria). Because the mean of the PCL in the current sample is actually fairly high according to the VA National Center for PTSD (PCL-C, 2012), we can assume (especially when taking in consideration the mean on the IES and the sheer severity of the events of 9/11) that a significant portion of this population was likely traumatized/distressed at the time of the survey administration, which was also evidenced in other populations on a national level shortly after 9/11 and in NYC residents shortly after the one month DSM-IV-TR Criterion (Neria et al., 2011). Therefore, the results based on the PCL can be deemed to reflect trauma symptoms. However, because this is a cross-sectional study, it is unknown if this sample would have met PTSD criteria at a later time point and if another Factor analysis would have resulted in different factors being found at a different point in time. Further research and better methodology in this area is clearly warranted.

**Discussion of proposed goal 3.**

To determine if social proximity, physical proximity, media exposure, age, gender, race, and coping styles contribute to PTSD-like symptoms (subclinical) as measured by the IES and PCL as continuous variables.

Overall, I found general consistency across the eight regressions. Two main predictors were almost always significant (i.e., white-Hispanic on the PCL and Monitoring coping style on the IES). There was also a main effect for younger age on the social proximity regression and higher scores on the IES. In the regressions, I mentioned how different predictors were added/subtracted, which I used to look for subgroups, however, I found no significant interaction effects. White-Hispanic was significant in all regressions using the PCL as the dependent variable with the exception of physical proximity although it was close ( $p = .076$). Monitoring was without question a consistent predictor for higher scores across all IES regressions. The finding that white-Hispanic scored significantly higher on the PCL is consistent with the literature across studies on 9/11 in NYC (for a review of NYC studies see Neria, DiGrande & Adams, 2011). While there are mixed results on age, many NYC studies found younger age to be a significant predictor. Also, lower educational achievement and lower socio-economic status were also significant predictors in NYC populations. The high percentage of Hispanics in NYC evidencing ASD, ASR, or PTSD-like symptoms could be contributed to other risk factors such as lower educational achievement and lower socio-economic status. Unfortunately, income was not measured in the current sample so the possible confounding effects of this variable could not be ruled out. Additional risk factors may be more pronounced in individuals who are younger. Also, more than one third of my sample had achieved a BA/BS or higher (14% had advanced degrees or some graduate school). Higher educational achievement is usually associated with increased age and is also considered a protective factor against PTSD. Protective factors such as higher educational achievement are likely inversely correlated with PTSD risk factors (e.g., lower socio-economic status).

The finding that Monitoring was associated with PTSD-like symptoms (subclinical) after a terrorist attack is consistent with Keinan et al. (2003). They investigated Monitors and Blunters after a terrorist attack in Israel. With numerous 9/11 studies indicating that increased television viewing of 9/11 events was correlated with ASD, ASR and PTSD-like symptoms, individuals who prefer to “monitor” threatening events (e.g., increased media viewing) could account for the increased scores on the IES in this sample. While no overt effects of media were seen in this sample, the media

question was poorly designed. Predictors of PTSD-like symptoms in other studies had greater sample sizes and included more specific information regarding media viewed. One important predictor was watching events live. In my sample, only 6.1% ($n$ = 6) indicated they watched events live while they were occurring on T.V. compared to 60% ($n$ = 520) found by Silver et al., (2002) in their national sample. Also, only 29.3% ($n$ = 29) indicated they saw multiple replays of the events. Increased hours of viewing 9/11 events on T.V. was positively associated with increased PTSD-like symptoms (Neria et al., 2011). Whether Monitor coping behavior was associated with increased viewing of televised 9/11 events and hence, increased symptoms of PTSD-like symptoms of the IES remains unknown. Unfortunately, I did not find other studies that used the MBSS in association with a terrorist event or community disasters to compare these outcomes. Voss, Muller and Schermelleh-Engel (2006) (who introduced a similar scale as the MBSS but added stressful events that a person has control over) noted that individuals who used Blunting coping strategies in uncontrollable adverse events faired better than those who used Monitoring coping strategies. They claim this is because Blunters can reduce stress by using distractive techniques or re-evaluation. However, they also note that the reverse is true for situations where a person has control in adverse situations. It is possible that 9/11 events were viewed largely as uncontrollable. This may account for the high scores on the IES by individuals who used Monitoring coping strategies.

It is unclear why white-Hispanic was not associated with higher scores on the IES and why individuals who scored high on Monitoring did not evidence increased scores on the PCL. It's possible that despite the modest to high correlation of the IES and PCL, the difference in test designs could have played a factor. Also, because 21% of the sample had completely missing PCL data, it is possible this could be related to what time in the 10-30 days individuals took the PCL and could therefore influence score outcomes. Unfortunately, that information is not known. The significant effect found for younger age and higher scores on the IES (i.e., the social proximity IES regression) is unknown Although younger age was close to significant in other IES regressions as well but not the PCL. It's possible if the sample were larger, these effects may have been more pronounced or possibly diminished. In NYC community samples after 9/11, studies found age as a predictor of PTSD-like (subclinical) symptoms but they varied from

younger age (i.e., Adams and Boscarino, 2006; Schlenger et al., 2002) to older age (Neria et al., 2011). I found individuals in this sample who were younger in age evidenced more PTSD-like (subclinical) symptoms on the IES when social proximity was the extra predictor in the regression. However, my sample had an average age of 27.6 years, which is higher than most college samples that I have found investigating PTSD-like symptoms (e.g., Adkins et al., 2008; Blanchard et al., 2002; Conybeare et al., 2012). It is interesting to note that of the 18 individuals who scored 50 or higher on the PCL, 14 (77.7%) were below the mean age of the sample. Perhaps looking at these measurements differently would have revealed more information. However, for the purpose of this dissertation, limitations encountered were too great to account for the variance observed in this population.

**Discussion of proposed goal 4.**

To determine the prevalence of PTSD-like (subclinical) symptoms in this population using 1) recommended cutoff scores for the IES and PCL and 2) the DSM-IV-TR criteria B, C and D for PTSD (i.e., a recommended alternative scoring method for the PCL) for the PCL. The use of both scoring methods is considered best (VA National Center for PTSD) ("PTSD Checklist [PCL]", 2012).

*The IES*

According to Horowitz et al (1977), a score of 19 or higher should indicate clinical concern although the scale was not designed to measure PTSD per se but became one of the largest used tools to aid in PTSD diagnosis. Other researchers who focused specifically on PTSD found a score of 35 or higher to be the optimum cutoff score resulting in the best sensitivity with the lowest misclassification (Joseph, 2000; Sundin & Horowitz, 2002). As mentioned earlier, Joseph (2000) said the IES has excellent PTSD predictive power of future PTSD and should be used as an independent variable rather than a dependent variable. Based on these general recommendations, the results I found in this sample seem to be fairly high with 76 (76.8%) scoring 19 or higher and 26 (26.3%) scoring 35 or higher. Unfortunately, I do not have repeated measures of the IES or know the time post-9/11 the IES was administered to ascertain if these values declined over time, increased, or remained similar. Assuming the IES has predictive validity for

future PTSD (Joseph, 2000), these results are concerning. Unfortunately, no other studies in NYC used the IES in their studies to determine if this sample is different from other samples in NYC (even with the administration occurring 10-30 days after 9/11). However, the moderate correlation of the IES with the PCL and other PTSD measures (range.77-.90) (Sundin & Horowitz, 2002) would indicate this sample is scoring high on this measure. Again, because of limitations with the sample size, data set (e.g., time of administration), lack of other studies that used the IES shortly after 9/11 and the lack of follow-up, it is difficult to know if individuals would continue to score in this range at a later point. However, it is known that a large percentage of people (22.2%) who participated in the study lost someone they knew, which could also account for the high scores seen in this sample. Losing someone you knew and being Hispanic were consistent predictors of PTSD in NYC studies (Neria et al., 2011). In addition, even though the measurement specifically asked about 9/11, it is unknown if individuals were distressed about other things, had pre-existing conditions (e.g., prior mental illness, financial issues, etc.) that made them more vulnerable to the effects of 9/11 including pre-existing PTSD.

*The PCL*

Similar to the IES, a large percentage scored high on the PCL. Using the lowest cutoff point (population estimates of 15% or less), 48 (48.5%) would be considered at risk for PTSD. If the moderate cutoff score (36-44; population estimates of 16-39%) were used, 39 (39.4%) would be considered at risk for PTSD. If the high-risk cutoff score (45-50; population estimates of 40% or higher) were used, 30 (30.3%) would be considered at risk for PTSD. Most NYC studies that focused on high-risk populations (e.g., NYC fire fighters, WTC survivors, etc.) used a cutoff of either 44 or 50. Others used these cutoff scores and DSM-IV-TR criteria B, C and D (Neria et al., 2011). While a clinical interview such as the Clinical-Administered PTSD scale (CAPS) (Blake, Weathers, Nagy, Kaloupek, Klauminizer, Charney, & Keane, 1995) is considered the best method to assess PTSD (North & Pfefferbaum, 2002), a score of 50 is considered a presumptive diagnostic of PTSD for military populations while 44 is considered a presumptive diagnostic for civilian populations (“PCL-C,” 2013). Combining DSM-IV-TR diagnostic criteria with these cutoff scores is considered the best method if clinical interviews are not possible. Because the PCL was administered 10-30 days after 9/11, the results should be

interpreted with caution. However, symptom clusters should be seen if a person were to be diagnosed after the one-month period. Again, the DSM-IV-TR states these symptoms must be present for a month. However, it is also possible that events after 9/11 (i.e. post-trauma predictors) could push someone to develop PTSD who may not be evidencing symptoms during this period or it is also possible that post-trauma events may prevent its development. Also, the need for the presence of one month indicates that PTSD symptoms may be present for a short period and then dissipate. Unfortunately, I do not have follow-up data on this sample nor can I compare the scores and clusters based on the date the survey was administered since this data were not provided in the data set.

When looking at DSM-IV-TR PTSD criteria, 28 (28.3%) met Criterion B, Criterion C and Criterion D. Criterion B requires one re-experiencing symptom; Criterion C requires three avoidant/numbing symptoms; and Criterion D requires two symptoms that are referred to as hyper-vigilance. In this sample (of the individuals who met DSM-IV-TR criteria B, C and D on the PCL) two individuals were in the range of 36-44, nine were in the range 45-49, and 17 scored 50 or higher. It is interesting to note that if we were to compare scoring techniques (i.e., score of 44 or higher versus the DSM-IV-TR criteria, only five people did not meet both. One person met all of the DSM-IV-TR criteria but scored a 43, while one person who scored a 50 did not meet Criterion C, indicating the lack of clear correspondence between PCL scores and DSM-IV-TR criteria for PTSD. Criterion C is often referred to as the rate-limiting step (Silver et al., 2002), which was the case with the person who scored 50. But if we look at individuals who scored between 45 and 50, this does not appear to be the case. It is interesting to note that Criterion B appeared to be the rate limiting step in this score range, which is unexpected since only one of five questions is needed to be a rated a three or higher yet they still scored in the 45-49 range. However, for individuals who scored 44 or below the rate-limiting step of Criterion C seems more apparent. Unfortunately, all studies completed in the first month of 9/11 used very different methods (i.e., Schuster et al., 2001 and Silver et al., 2002). First, both studies were national studies. Silver et al. (2002) focused on Acute Stress Disorder where most questions are designed to detect dissociation and Schuster et al. (2001) asked five PCL questions (questions that 50% of victims from the Oklahoma City bombing answered a three or higher two months after the Oklahoma City

bombing). They conducted their study three to five days after 9/11 and if a person answered a four or five on just one question they were considered to have a high stress response. They do not discuss the total results (i.e., what percent answered more than one, etc.) but reported 44% answered a four or higher on one of the five questions. A fairly close comparison for this study is Blanchard et al. (2004). They had psychology students who were in two classes (Introduction to Psychology and Abnormal Psychology) who attended Albany University and two other universities in Georgia and North Dakota 6-10 weeks after 9/11. They had them answer retrospectively on the Acute Stress Disorder Scale (ASDS) (i.e., answer this questionnaire for how you felt during the first two weeks after 9/11). They also had them complete the PCL with respect to 9/11 and asked them to answer on how they felt for the last month. They then looked at students whose permanent residences were in NYC and four other levels (e.g., level two were counties surrounding NYC, level 3 were counties surrounding the second level and so on). Albany students scored significantly higher on both the ASD scale and the PCL compared to the university students in Georgia and North Dakota. They used a cutoff score of 40 and the DSM-IV-TR scoring method (Criteria B, C and D). A score of 40 or higher they argued indicated subjective distress for Criterion F. The mean score for the PCL was 33.59 in this my sample while the mean score for Albany students was 28.6. They found 28% met ASD criteria and 11.3% met criteria for PTSD at Albany University. Individuals with permanent residences in NYC, ASDS and PCL means were 43.2 and 29.2 respectively. In level two ASDS and PCL means were 45.3 and 31.1 respectively. Both levels were significantly higher than all other New York state levels. Level one and level two groups likely accounted for a lot of their findings. This is consistent with other terror PTSD research with respect to proximity being a risk factor for PTSD (Neria, DiGrande & Adams, 2011). It is interesting to note that their retrospective ASDS scale had a positive predictive power (accurately predicted PTSD or true positive) of .33 and a negative predictive power (accurately predicted no PTSD or true negative) of .99.

With the recent publication of the DSM-5 (American Psychiatric Society, 2013), the presence of 9 symptoms (regardless of clusters) constitutes ASD. I reviewed the sample data for individuals who scored a three or higher on PCL questions. Thirty-one (31.3%) individuals marked nine or more questions as a three or higher, which is very

similar to results using the cutoff criteria of 44 (although the new DSM-5 requires the presence of at least nine, I did not include anyone who marked two or lower).

Several researchers have concluded that the DSM-IV-TR ASD requirements were too constrictive (Bryant, Creamer, O'Donnell, Silove, and McFarlane, 2008; Dalgleish et al., 2008; Harvey and Bryant, 1998; Kassam-Adams and Winston, 2004) and that ASD may represent a unique type of PTSD. The focus on dissociation also misses a lot of individuals who will develop PTSD. Bryant (2013) noted that good predictors were lacking and discussed the importance of therapy for individuals with various acute stress reactions or ASD, the complexity of the course of PTSD and its various manifestations across time. He also highlighted four trajectories for PTSD development or the lack of development stating:

> Several studies have noted four major trajectories following traumatic experiences: (a) resilient class with few PTSD symptoms, (b) recovery class with initial distress then gradual remission over time, (c) delayed reaction class with initially low symptom levels but increasing symptoms over time, and (d) chronic distress with consistently high PTSD levels. These trajectories have been documented in survivors of traumatic injury, severe acute respiratory syndrome (SARS) infection, women diagnosed with breast cancer, and military personnel deployed to the Middle East. These complex and often fluctuating courses of posttraumatic adjustment represent a marked challenge for any attempt to use acute symptoms as a marker for trauma survivors who will develop chronic PTSD: for a review, see Bonanno and Mancini, 2012 (Bryant, 2013, p. 2).

**Limitations**

This study using archived data has serious limitations. The data set did not have information regarding which participants were students, faculty, or staff. It did not include the date that participants were administered the survey. It did not have information regarding which participants attended which campus or if they attended more than one. It did not include where participants resided or worked.

I did not have control of the design, questions, measures, or procedures so I do not know very important information that comes with being the person responsible for all of the elements that go with conducting research. An archived data set has inherent

limitations because of these factors and more. A lot of data were missing and did not match questions on the questionnaire. Not having the actual raw data (i.e., surveys) hindered figuring out many very important variables that did not make it to the data set (e.g., dates of administration, total scores rather than single scores, responses that included more than one option, or perhaps even additional information offered by a person because of design limitations). The current data may have potential valuable information for researchers interested in data points under the constraints outlined above, however, all results should be interpreted with caution because of the plethora of limitations with the measures that I have mentioned throughout the paper. These data were generated from an opportunistic terrorist situation, which inherently poses threats to conducting sound research (e.g., because of the unpredictability in occurrences and locations). Future research in trauma should be prepared with methodological strategies to maximize information obtained and strategies to eliminate as much error as possible. While replication is important in science, it is not often that comparable opportunities will present themselves. Trauma researchers must move forward to overcome these inherent challenges. A quote by Samuel Beckett seems applicable. "Try again, fail again. Fail better."

**Conclusion**

In my study I found that this population scored fairly high on two stress measures. I found using multiple regression analyses that white-Hispanics scored significantly higher on the PCL (three of four regressions), indicating higher distress. The particular risk factors that are indicated by this proxy ethnicity variable are unknown. However, we know that this population was particularly vulnerable to the events of 9/11 in NYC. I also found individuals scored higher on the IES who used a Monitoring coping style (i.e., four of four regressions) and in individuals who were younger (i.e., one of four regressions). Higher scores seemed to match fairly well across measures and scoring methods (e.g., the DSM scoring method). I also found that a large percentage of the sample (22%) knew someone who died from the events of 9/11 (i.e., immediate family, a close relative, an acquaintance or a co-worker). Just based on the number of individuals who lost someone they knew on 9/11, the high scores on stress measures do not seem unwarranted. Loss of life was just one of many possibilities that could have inflicted harm in this population.

There are likely numerous other factors not measured in the current study that potentially put this population at greater risk compared to other populations in the NYC region surveyed. Clearly, better methods and replication is vital to untangling the complexity of trauma. There is a growing consensus that trauma research needs greater attention and greater methodological approaches. It is my hope that some of these data have been preserved despite limitations.

The immense amount of research on 9/11 has evidenced the complexity of trauma research well. All situations are unique. Exceptions to the rule are the norm. There are likely many reasons for this but they offer insight to where current theory does not stand footing. Data should not be absconded to "fit" where it clearly does not nor should it be ignored. While challenging, it is clear that trauma does not exist in a vacuum. Working from a predetermined mindset carries risks (e.g., cognitive biases). While it may be important to keep current theory in mind, it is probably more important to think outside of the current dogma. If we can learn anything from 9/11, it is that our understanding of trauma is seriously lacking. More comprehensive studies with better methodologies are clearly warranted.

APPENDICES

## Appendix A: Approximate Consent Form



Informed Consent for Participants in Mercy College Research
Project: Adaptation to Stressful Events

You are being asked to participate in a study being conducted to obtain information related to understanding of the feelings experienced by Mercy College students and employees in reaction to recent events of the memorial of the 9/11 tragedy and the reaction to the Hurricanes. This study is being conducted by Dr. Melamed; the director of the Masters Psychology and the Marriage and Family Therapy programs at Mercy College.

As part of this study you will be asked to complete a few brief questionnaires that should take about 15-20 minutes. There are no right and wrong answers. There are no known risks to you from participating in this study. As the participants in this study you will not directly benefit although you will contribute to our understanding of how we deal with stress. Research has been shown that expressing your feelings often helps in reducing your own anxiety.

If you are interested in also participating in future re-administrations please give your preferred contact information. The surveys can be re-administered via the internet if you choose. You may choose to anonymously fill in the current questionnaires. We appreciate your thoughtfulness in volunteering. Information about stress resilience is important to psychology and to your fellow humans. You will not be identified in any publication or presentation of the study findings as only group results will be reported. All documents from this study will be kept confidential in a locked file cabinet in the office of Dr. Melamed, the Mercy College faculty mentor for this project and shredded after the data has been disseminated in appropriate format.

Your decision whether or not to participate will not affect your current or future relations with Mercy College. If you decide to participate, you are free to withdraw at any time without affecting this relationship. You may also choose not to answer questions on the questionnaires. The researcher also may choose to withdraw you from this study if it is in your best interest

You are encouraged to ask any questions regarding the research to Dr. Melamed, who may be reached at 914-674-7345. If you wish to find out the results of this study you may call the Behavioral Science Department (Dr. Melamed 914-674-7345) about three months after participation. The Institutional Review Board (IRB) of Mercy College has approved recruitment of participants for this research. If you have questions regarding this review process or your rights as a research participant please contact Kathleen Golisz, the IRB chairperson, at 914-674-7814 or mcirb#@mercy.edu.

SIGNED AGREEMENT

I understand that;
(a) My signature indicates that I voluntarily agree to be a part of this research study.
(b) By signing this form I do not waive any legal rights.
(c) I will receive a copy of this form.

Signature of Subject_____ Date_____

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By providing contact information and signing the section below, you are consenting to be contacted periodically to see if you are interested in participating in follow up surveys on the same topic. At the time of the follow up surveys you will have the opportunity to decide if you wish to participate.

Please Print Your Full Name in capital letters _____

Signature of Subject_____ Date_____

Street Address:_____

City_____ State_____ Zip code_____

Preferred Email_____

Phone Number(area code) ( )-_____

*To help use match your previous data to the follow up data we ask that you create a code using your year of birth and the last 4 digits of your home phone number. If you are consenting to follow up surveys please place this number at the top of your surveys.*

CODE # Year of birth 1/9/__/___ -last four digits of home phone # __/__/__/__

**Appendix B: Survey**

1. Age in years ____

____2. Gender_____

1. Male 2. Female

____3. Race _____

1. Black
2. White
3. Hispanic
4. Asian American
5. Native American
6. Non- White/Hispanic
7. Other

____4. Relationship Status

1- Single
2- Married
3- Cohabiting
4- Divorced
5- Separated
6- Remarried

____5. Sexual Orientation

1- Heterosexual
2- Bisexual
3- Homosexual

____6. Number of Children(include step-children if they resided with you._____

____7. What is your current religious identification?

1- Catholic
2- Protestant {which sect? _____}
3- Jewish
4- Other {which one? _____}
5- None

____8. What is your employment status?

0- Not working
1- Working part-time
2- Working full- time (More than 30 hours a week)
3- On disability
4- Student

Follow Up CODE: #_____
(8 numbers please: Year of birth_____4 last digits of phone _____)
Enter only if you consent to receive follow up surveys

____ 9. Are you a US Citizen? If not please indicate number of years you have been living in the United Sates.

1- Yes
2- No If so, please indicate number of years you have been living in the United States.
Number of years____

____10. What is your Job? {If unemployed what was your last Job?}

0- Unemployed Specify: _____
1- Professional (i.e., Physician, Lawyer, Psychologist, Social Worker, Nurse, Accountant, Architect, Engineer, Teacher)
2- White- Collar (i.e., clerk, secretary, salesperson, middle manager, salesperson)
3- Blue- Collar (i.e., technician, laborer, mechanic, food service worker, child care worker
4- Student
5- Homemaker (and/ or full-time care giver to a child)

____11. What is your highest educational degree? {What was the last grade you completed in school?}

1- MD, PhD or equivalent
2- MA/MS or equivalent
3- Some graduate School
4- BA/BS or equivalent
5- AA or some college
6- High School Graduate
7- Some High School
8- Grammar School (eighth grade or less)

____12. With whom do you live? Circle the one which best specifies your situation today.

0- Alone
1- Spouse/ partner
2- Children
3- Spouse/ Partner and children
4- Parents or relatives
5- Parents or relatives and children
6- Parents/ Relatives and children
7- Roommate(s) How many?_____

____13. How far were you from the cite of WTC disaster?

0- Ground zero (at WTC vicinity)
1- Less than 5 miles
2- Empire State building area
3- > 5 miles
4- > 10 miles
5- Out of the NYC area

____14. Were you in sight of the WTC

0- Was there when it happened
1- Viewed on TV as it happened
2- Viewed replay
3- Watched several replays (more than once/day)

**Follow Up CODE: #_____**
**(8 numbers please: Year of birth_____4 last digits of phone _____)**
**Enter only if you consent to receive follow up surveys**

15. Did you lose someone in the World Trade Center Disaster? (Circle all that apply).
    0- I was hurt physically by the disaster
    1- Family, immediate
    2- Close Relative
    3- Acquaintance/ co- worker
    4- Didn't know anyone personally

## Appendix C: IES

Follow Up CODE: #_____
(8 numbers please: Year of birth_____4 last digits of phone _____)
Enter only if you consent to receive follow up surveys

Below is a list of comments made by people after stressful life events. Please check each item indicating how frequently these comments were true for you DURING THE PAST SEVEN DAYS. If they did not occur during that time, please mark the "not at all column".

Please think of the following event while filling out the questionnaire: **During the World Trade Center Crisis.** 9/11

| | Not at All | Rarely | Sometimes | Often |
|---|---|---|---|---|
| 1. I thought about it when I didn't mean to | | | | |
| 2. I avoided letting myself get upset when I thought about it or was reminded of it. | | | | |
| 3. I tried to remove it from my memory. | | | | |
| 4. I had trouble falling asleep or staying asleep. | | | | |
| 5. I had waves of strong feelings about it. | | | | |
| 6. I had dreams about it. | | | | |
| 7. I felt as if it hadn't happened or wasn't real. | | | | |
| 8. I tried not to talk about it. | | | | |
| 9. Pictures about it popped into my mind. | | | | |
| 10.I stayed away from reminders of it. | | | | |
| 11. Other things kept making me think about it. | | | | |
| 12. I was aware that I still had a lot of feelings about it, but didn't deal with them. | | | | |
| 13.I tried not to think about it. | | | | |
| 14. Any reminder brought back feelings about it. | | | | |
| 15. My feelings about it were kind of numb. | | | | |

**Appendix D: The PCL**

## PTSD CheckList – Version (PCL-S)

Below is a list of problems and complaints that people sometimes have in response to stressful life experiences. Please answer the following questions with respect to 9/11. Put an "X" in the box to indicate how much you have been bothered by that problem *in the last month*.

| No. | Response | Not at all (1) | A little bit (2) | Moderately (3) | Quite a bit (4) | Extremely (5) |
|---|---|---|---|---|---|---|
| **1.** | Repeated, disturbing *memories, thoughts, or images* of a stressful experience from the past? | | | | | |
| **2.** | Repeated, disturbing *dreams* of a stressful experience from the past? | | | | | |
| **3.** | Suddenly *acting* or *feeling* as if a stressful experience *were happening* again (as if you were reliving it)? | | | | | |
| **4.** | Feeling *very upset* when *something reminded* you of a stressful experience from the past? | | | | | |
| **5.** | Having *physical reactions* (e.g., heart pounding, trouble breathing, or sweating) when *something reminded* you of a stressful experience from the past? | | | | | |
| **6.** | Avoid *thinking about* or *talking about* a stressful experience from the past or avoid *having feelings* related to it? | | | | | |
| **7.** | Avoid *activities* or *situations* because they *remind you* of a stressful experience from the past? | | | | | |
| **8.** | Trouble *remembering important parts* of a stressful experience from the past? | | | | | |
| **9.** | Loss of *interest in things that you used to enjoy?* | | | | | |
| **10.** | Feeling *distant* or *cut* off from other people? | | | | | |
| **11.** | Feeling *emotionally numb* or being unable to have loving feelings for those close to you? | | | | | |
| **12.** | Feeling as if your *future* will somehow be *cut short*? | | | | | |
| **13.** | Trouble *falling* or *staying asleep*? | | | | | |
| **14.** | Feeling *irritable* or having *angry outbursts*? | | | | | |
| **15.** | Having *difficulty concentrating*? | | | | | |
| **16.** | Being *"super alert"* or watchful on guard? | | | | | |
| **171 17.** | Feeling *jumpy* or easily startled? | | | | | |

## Appendix E: The MBSS

**The Miller Behavioral Style Scale**

**Note.** Developed by Suzanne M. Miller (1987). *Journal of Personality and Social Psychology*, vol. 52, P. 345-353. Question # 2 was modified for the WTC attack that occurred on September 11, 2001.

Next are four scenarios followed by statements describing what you might do in each situation. You can pick as many or as few statements as you like.

1.Vividly imagine that you are afraid of the dentist and have to get some dental work done. Which of the following do you do? Check all the statements that apply to you.

1.(M) I would ask the dentist exactly what work was going to be done.

2.(B) I would take a tranquillizer or have a drink before going.

3.(B) I would try to think about pleasant memories.

4.(M) I would want the dentist to tell me when I would feel pain.

5.(B) I would try to sleep.

6.(M) I would watch all the dentist's movements and listen for the sound of the drill.

7.(M) I would watch the flow of water from my mouth to see if it contained blood.

8.(B) I would do mental puzzles in my mind.

2.After the 911 attack on the WTC. Check all that apply to you.

1.(B) I would sit by myself and have as many daydreams as possible and fantasies as I could.

2.(M) I would stay alert and try to keep myself from falling asleep.

3.(M) I would exchange 911 WTC stories with other people.

4.(M) If there was a radio present, I would stay near it and listen to bulletins about what the police were doing.

5.(B) I smoked or used alcohol more than usual.

6.(M) I would watch every moment of my captors and keep an eye on their weapons.

7.(B) I would try to sleep as much as possible.

8.(B) I would think about how nice it's going to be when I get home.

9.(M) I would make sure I knew where every possible exit was.

3.Vividly imagine that due to a large drop in sales, it is rumored that several people in your department at work will be laid off. Your supervisor has turned in an evaluation of your work for the past year. The decision about lay-offs has been made and will be announced in several days. Check all the statements that apply to you.

1.(M) I would talk to my fellow workers to see if they knew anything about what the supervisor's evaluation of me.

2.(M) I would review a list of duties for my present job and try to figure out if I had fulfilled them all.

3.(B) I would go to the movies to take my mind off of things.

4.(M) I would try to remember any arguments or disagreements I might have had that would have resulted in the supervisor having a lower opinion of me.

5.(B) I would push all thoughts of being laid off out of my mind.

6.(B) I would tell my spouse that I would rather not discuss my chances of being laid off.

7.(M) I would try to think which employees in my department the supervisor might have thought had done the worst job.

8.(B) I would continue doing my work as if nothing special was happening.

4.Vividly imagine that you are on an airplane, thirty minutes from your destination, when the plane unexpectedly goes into a deep dive and then suddenly levels off. After a short time, the pilot announces that nothing is wrong, although the rest of the ride may be rough. You, however, are not convinced that all is well. Check all statements that might apply to you.

1.(M) I would carefully read the information provided about safety features in the plane and make sure I knew where the emergency exits were.

2.(B) I would make small talk with the passenger beside me.

3.(B) I would watch the end of the movie, even if I had seen it before.

4.(M) I would call the flight attendant and ask what exactly the problem was.

5.(B) I would order a drink from the flight attendant or take a tranquilizer.

6.(M) I would listen carefully to the engines for unusual noises and would watch the crew to see if their behavior was out of the ordinary.

7.(M) I would talk to the passenger beside me about what might be wrong.

8.(B) I would settle down and read a book or magazine or write a letter.

## Appendix F: Statistical Tables

*IES Reliability*

Table 15. IES Total Item Statistics.

| IES Item | Mean | Standard Deviation Extraction | N |
|---|---|---|---|
| IES 1 | 2.89 | 1.761 | 99 |
| IES 2 | 1.95 | 1.320 | 99 |
| IES 3 | 1.48 | 1.358 | 99 |
| IES 4 | 1.15 | 1.358 | 99 |
| IES 5 | 2.49 | 1.063 | 99 |
| IES 6 | 1.00 | 1.286 | 99 |
| IES 7 | 2.04 | 1.289 | 99 |
| IES 8 | 1.42 | 1.363 | 99 |
| IES 9 | 2.27 | 1.168 | 99 |
| IES 10 | 1.39 | 1.316 | 99 |
| IES 11 | 2.23 | 1.177 | 99 |
| IES 12 | 1.53 | 1.312 | 99 |
| IES 13 | 1.69 | 1.314 | 99 |
| IES 14 | 2.16 | 1.283 | 99 |
| IES 15 | 1.62 | 1.353 | 99 |

Table 16. IES “Theoretical” Intrusion Item Statistics.

| IES Item | Mean | Std. Deviation | N |
|---|---|---|---|
| IES 1 | 2.88 | 1.751 | 99 |
| IES 4 | 1.13 | 1.330 | 99 |
| IES 5 | 2.43 | 1.071 | 99 |
| IES 6 | 1.02 | 1.309 | 99 |
| IES 9 | 2.28 | 1.178 | 99 |
| IES 11 | 2.22 | 1.174 | 99 |
| IES 14 | 2.16 | 1.283 | 99 |

Table 17. IES "Theoretical" Intrusion Item-Total Statistics.

| IES Item | Scale Mean if Item | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|
| IES 1 | 11.25 | 25.864 | .417 | .780 |
| IES 4 | 13.00 | 27.000 | .549 | .740 |
| IES 5 | 11.70 | 28.887 | .550 | .745 |
| IES 6 | 13.11 | 28.998 | .401 | .770 |
| IES 9 | 11.85 | 28.477 | .516 | .748 |
| IES 11 | 11.91 | 28.757 | .494 | .752 |
| IES 14 | 11.97 | 25.928 | .672 | .716 |

Table 18. IES "Theoretical" Avoidance Item Statistics.

| IES Item | Mean | Std. Deviation | N |
|---|---|---|---|
| IES 2 | 1.949 | 1.3200 | 99 |
| IES 3 | 1.515 | 1.3804 | 99 |
| IES 7 | 2.033 | 1.2928 | 99 |
| IES 8 | 1.434 | 1.3714 | 99 |
| IES 10 | 1.404 | 1.3319 | 99 |
| IES 12 | 1.535 | 1.3195 | 99 |
| IES 13 | 1.687 | 1.3143 | 99 |
| IES 15 | 1.616 | 1.3531 | 99 |

Table 19. IES "Theoretical" Avoidance Item-Total Statistics.

| IES Item | Scale Mean if | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|
| IES 2 | 11.225 | 38.319 | .476 | .785 |
| IES 3 | 11.660 | 35.778 | .615 | .763 |
| IES 7 | 11.141 | 41.633 | .272 | .814 |
| IES 8 | 11.740 | 36.929 | .542 | .775 |
| IES 10 | 11.771 | 35.893 | .638 | .760 |
| IES 12 | 11.639 | 37.600 | .526 | .778 |
| IES 13 | 11.488 | 36.558 | .601 | .766 |
| IES 15 | 11.559 | 38.637 | .439 | .791 |

*IES Exploratory Factor Analysis*

Table 20. EFA IES Total Communalities.

| Item | Initial Total Communalities |
|---|---|
| IES 1 | .301 |
| IES 2 | .341 |
| IES 3 | .454 |
| IES 4 | .472 |
| IES 5 | .438 |
| IES 6 | .331 |
| IES 7 | .384 |
| IES 8 | .481 |
| IES 9 | .367 |
| IES 10 | .542 |
| IES 11 | .585 |
| IES 12 | .414 |
| IES 13 | .569 |
| IES 14 | .579 |
| IES 15 | .299 |

Note: Extraction Method: Maximum Likelihood.

Table 21. EFA IES Total Variance Explained.

| IES Factors and Loadings | | Initial Eigenvalues | | Rotation Sums of Squared Loadings [a] |
|---|---|---|---|---|
| Factor | Total | % of Variance | Cumulative % | Total |
| 1 | 5.208 | 34.717 | 34.717 | 4.001 |
| 2 | 1.82 | 12.144 | 46.861 | 3.582 |
| 3 | 1.13 | 7.534 | 54.396 | |
| 4 | .975 | 6.499 | 60.895 | |
| 5 | .886 | 5.905 | 66.800 | |
| 6 | .818 | 5.454 | 72.254 | |
| 7 | .721 | 4.810 | 77.064 | |
| 8 | .663 | 4.420 | 81.484 | |
| 9 | .587 | 3.913 | 85.397 | |
| 10 | .501 | 3.341 | 88.738 | |
| 11 | .469 | 3.129 | 91.867 | |
| 12 | .395 | 2.632 | 94.498 | |
| 13 | .336 | 2.243 | 96.742 | |
| 14 | .268 | 1.786 | 98.528 | |
| 15 | .221 | 1.472 | 100.000 | |

Note: Extraction Method: Maximum Likelihood. [a] When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Table 22. EFA IES Pattern Matrix [a].

| IES Pattern Matrix | | |
|---|---|---|
| IES Item | Factor 1 | Factor 2 |
| IES 1 | .448 | .026 |
| IES 2 | .138 | .433 |
| IES 3 | .164 | .525 |
| IES 4 | .534 | .096 |
| IES 5 | .695 | -.106 |
| IES 6 | .302 | .169 |
| IES 7 | .619 | -.100 |
| IES 8 | -.238 | .851 |
| IES 9 | .474 | .156 |
| IES 10 | .101 | .708 |
| IES 11 | .715 | -.014 |
| IES 12 | .398 | .305 |
| IES 13 | -.071 | .785 |
| IES 14 | .796 | -.023 |
| IES 15 | .248 | .321 |

Note: Extraction Method: Maximum Likelihood. Rotation Method: Promax with Kaiser Normalization. [a] Rotation converged in 3 iterations.

Table 23. EFA IES Structure Matrix.

| IES Structure Matrix | | |
|---|---|---|
| IES Item | Factor 1 | Factor 2 |
| IES 1 | .462 | .254 |
| IES 2 | .358 | .503 |
| IES 3 | .430 | .608 |
| IES 4 | .582 | .367 |
| IES 5 | .641 | .246 |
| IES 6 | .388 | .322 |
| IES 7 | .568 | .215 |
| IES 8 | .194 | .730 |
| IES 9 | .553 | .396 |
| IES 10 | .460 | .759 |
| IES 11 | .708 | .349 |
| IES 12 | .553 | .507 |
| IES 13 | .328 | .749 |
| IES 14 | .784 | .381 |
| IES 15 | .411 | .446 |

Note: Extraction Method: Maximum Likelihood. Rotation Method: Promax with Kaiser Normalization.

*IES reliability for Mercy College based on EFA.*

Table 24. Mercy College IES "Intrusion" Item Statistics (IES EFA).

| IES Item | Mean | Std. Deviation | N |
|---|---|---|---|
| IES 1 | 2.879 | 1.7512 | 99 |
| IES 4 | 1.131 | 1.3298 | 99 |
| IES 5 | 2.434 | 1.0706 | 99 |
| IES 6 | 1.020 | 1.3091 | 99 |
| IES 7 | 2.033 | 1.2928 | 99 |
| IES 9 | 2.283 | 1.1784 | 99 |
| IES 11 | 2.222 | 1.1742 | 99 |
| IES 12 | 1.535 | 1.3195 | 99 |
| IES 14 | 2.162 | 1.2834 | 99 |

Table 25. Mercy College IES "Intrusion" Item-Total Statistics (IES EFA).

| IES Item | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|---|
| IES 1 | 14.821 | 43.567 | 0.436 | 0.235 | 0.816 |
| IES 4 | 16.569 | 44.625 | 0.581 | 0.425 | 0.791 |
| IES 5 | 15.266 | 47.528 | 0.545 | 0.369 | 0.797 |
| IES 6 | 16.680 | 47.910 | 0.391 | 0.306 | 0.813 |
| IES 7 | 15.667 | 45.898 | 0.522 | 0.361 | 0.798 |
| IES 9 | 15.417 | 46.964 | 0.518 | 0.321 | 0.799 |
| IES 11 | 15.478 | 46.174 | 0.574 | 0.547 | 0.793 |
| IES 12 | 16.165 | 46.076 | 0.497 | 0.337 | 0.801 |
| IES 14 | 15.538 | 43.765 | 0.665 | 0.565 | 0.781 |

Table 26. Mercy College IES "Intrusion" Inter-item Correlation Matrix (IES EFA).

| IES Item | IES 1 | IES 4 | IES 5 | IES 6 | IES 7 | IES 9 | IES 11 | IES 12 | IES 14 |
|---|---|---|---|---|---|---|---|---|---|
| IES 1 | 1.000 | 0.305 | 0.301 | 0.201 | 0.389 | 0.289 | 0.271 | 0.192 | 0.367 |
| IES 4 | 0.305 | 1.000 | 0.361 | 0.503 | 0.354 | 0.321 | 0.301 | 0.431 | 0.424 |
| IES 5 | 0.301 | 0.361 | 1.000 | 0.212 | 0.375 | 0.452 | 0.409 | 0.238 | 0.513 |
| IES 6 | 0.201 | 0.503 | 0.212 | 1.000 | 0.136 | 0.327 | 0.123 | 0.283 | 0.296 |
| IES 7 | 0.389 | 0.354 | 0.375 | 0.136 | 1.000 | 0.311 | 0.481 | 0.322 | 0.349 |
| IES 9 | 0.289 | 0.321 | 0.452 | 0.327 | 0.311 | 1.000 | 0.293 | 0.295 | 0.442 |
| IES 11 | 0.271 | 0.301 | 0.409 | 0.123 | 0.481 | 0.293 | 1.000 | 0.476 | 0.646 |
| IES 12 | 0.192 | 0.431 | 0.238 | 0.283 | 0.322 | 0.295 | 0.476 | 1.000 | 0.400 |
| IES 14 | 0.367 | 0.424 | 0.513 | 0.296 | 0.349 | 0.442 | 0.646 | 0.400 | 1.000 |

Table 27. Mercy College IES "Avoidance" Item Statistics (IES EFA).

| IES Item | Mean | Std. Deviation | N |
|---|---|---|---|
| IES 2 | 1.95 | 1.320 | 99 |
| IES 3 | 1.52 | 1.380 | 99 |
| IES 8 | 1.43 | 1.371 | 99 |
| IES 10 | 1.40 | 1.332 | 99 |
| IES 13 | 1.69 | 1.314 | 99 |
| IES 15 | 1.62 | 1.353 | 99 |

Table 28. Mercy College IES "Avoidance" Item-Total Statistics (IES EFA).

| IES Item | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|---|
| IES 2 | 7.66 | 24.697 | 0.461 | 0.257 | 0.788 |
| IES 3 | 8.09 | 22.757 | 0.594 | 0.383 | 0.758 |
| IES 8 | 8.17 | 22.899 | 0.587 | 0.391 | 0.760 |
| IES 10 | 8.20 | 22.510 | 0.649 | 0.475 | 0.745 |
| IES 13 | 7.92 | 22.769 | 0.637 | 0.497 | 0.749 |
| IES 15 | 7.99 | 25.173 | 0.404 | 0.224 | 0.802 |

Table 29. Mercy College IES "Avoidance" Inter-item Correlation Matrix (IES EFA).

| IES Item | IES 2 | IES 3 | IES 8 | IES 10 | IES 13 | IES 15 |
|---|---|---|---|---|---|---|
| IES 2 | 1.000 | 0.457 | 0.339 | 0.325 | 0.379 | 0.195 |
| IES 3 | 0.457 | 1.000 | 0.366 | 0.441 | 0.467 | 0.391 |
| IES 8 | 0.339 | 0.366 | 1.000 | 0.529 | 0.557 | 0.311 |
| IES 10 | 0.325 | 0.441 | 0.529 | 1.000 | 0.615 | 0.376 |
| IES 13 | 0.379 | 0.467 | 0.557 | 0.615 | 1.000 | 0.230 |
| IES 15 | 0.195 | 0.391 | 0.311 | 0.376 | 0.230 | 1.000 |

*MBSS Reliability*

Table 30. MBSS Monitoring Item Statistics.

| Scenario | Mean | Std. Deviation | N |
|---|---|---|---|
| Monitoring 1 | 2.08 | 1.240 | 99 |
| Monitoring 2 | 1.73 | 1.038 | 99 |
| Monitoring 3 | 1.96 | 1.384 | 99 |
| Monitoring 4 | 2.59 | 1.169 | 99 |

Table 31. MBSS Monitoring Item-Total Statistics.

| Scenario | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|
| Monitoring 1 | 6.27 | 6.629 | .425 | .513 |
| Monitoring 2 | 6.63 | 8.454 | .223 | .644 |
| Monitoring 3 | 6.39 | 5.689 | .496 | .450 |
| Monitoring 4 | 5.77 | 6.887 | .428 | .513 |

Table 32. MBSS Blunting Item Statistics.

| Scenario | Mean | Std. Deviation | N |
|---|---|---|---|
| Blunting 1 | 0.96 | 0.979 | 99 |
| Blunting 2 | 0.75 | 0.837 | 99 |
| Blunting 3 | 1.16 | 0.829 | 99 |
| Blunting 4 | 0.88 | 0.926 | 99 |

Table 33. MBSS Blunting Item-Total Statistics.

| Scenario | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|
| Blunting | 2.77 | 2.792 | .238 | .293 |
| Blunting | 2.98 | 2.938 | .309 | .222 |
| Blunting | 2.57 | 3.269 | .190 | .345 |
| Blunting | 2.87 | 3.258 | .123 | .420 |

*PCL Reliability*

Table 34. PCL Reliability Total Item Statistics.

| PCL Item | Mean | Standard Deviation Extraction | N |
|---|---|---|---|
| PCL 1 | 2.39 | 1.176 | 99 |
| PCL 2 | 1.86 | 1.152 | 99 |
| PCL 3 | 1.95 | 1.073 | 99 |
| PCL 4 | 2.29 | 1.247 | 99 |
| PCL 5 | 1.99 | 1.147 | 99 |
| PCL 6 | 2.04 | 1.340 | 99 |
| PCL 7 | 1.83 | 1.134 | 99 |
| PCL 8 | 1.90 | 1.156 | 99 |
| PCL 9 | 1.49 | 0.850 | 99 |
| PCL 10 | 2.04 | 1.384 | 99 |
| PCL 11 | 2.21 | 1.372 | 99 |
| PCL 12 | 1.80 | 1.229 | 99 |
| PCL 13 | 1.92 | 1.140 | 99 |
| PCL 14 | 1.90 | 1.216 | 99 |
| PCL 15 | 2.36 | 1.501 | 99 |
| PCL 16 | 1.95 | 1.190 | 99 |
| PCL 17 | 1.66 | 1.080 | 99 |

Table 35. Re-experience (Criterion B) Theoretical Item Statistics (Items 1-5).

| PCL tem | Mean | Std. Deviation | N |
|---|---|---|---|
| PCL 1 | 2.30 | 1.165 | 99 |
| PCL 2 | 1.93 | 1.180 | 99 |
| PCL 3 | 1.88 | 1.033 | 99 |
| PCL 4 | 2.41 | 1.325 | 99 |
| PCL 5 | 2.11 | 1.236 | 99 |

Table 36. Re-experience (Criterion B) Theoretical Item-Total Statistics (Items 1-5).

| PCL Item | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|
| PCL 1 | 8.33 | 12.531 | .498 | .722 |
| PCL 2 | 8.71 | 11.883 | .579 | .693 |
| PCL 3 | 8.76 | 12.532 | .600 | .692 |
| PCL 4 | 8.22 | 12.052 | .455 | .742 |
| PCL 5 | 8.53 | 12.068 | .511 | .718 |

Table 37. PCL Avoidance (Criterion C) Theoretical Item Statistics (Items 6-12).

| PCL Item | Mean | Std. Deviation | N |
|---|---|---|---|
| PCL 6 | 2.15 | 1.410 | 99 |
| PCL 7 | 1.75 | 1.082 | 99 |
| PCL 8 | 1.99 | 1.266 | 99 |
| PCL 9 | 1.69 | 1.066 | 99 |
| PCL 10 | 1.90 | 1.258 | 99 |
| PCL 11 | 2.15 | 1.373 | 99 |
| PCL 12 | 1.98 | 1.400 | 99 |

Table 38. PCL Avoidance (Criterion C) Theoretical Item-Total Statistics (Items 6-12).

| PCL Item | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|
| PCL 6 | 11.45 | 30.067 | .713 | .828 |
| PCL 7 | 11.86 | 34.306 | .600 | .845 |
| PCL 8 | 11.62 | 31.851 | .674 | .834 |
| PCL 9 | 11.92 | 32.973 | .733 | .829 |
| PCL 10 | 11.71 | 32.658 | .615 | .842 |
| PCL 11 | 11.45 | 33.985 | .450 | .867 |
| PCL 12 | 11.63 | 30.869 | .659 | .836 |

Table 39. Hyper-Arousal (Criterion D) Theoretical Item Statistics (Items 13-17).

| PCL Item | Mean | Std. Deviation | N |
|---|---|---|---|
| PCL 13 | 1.97 | 1.216 | 99 |
| PCL 14 | 1.90 | 1.156 | 99 |
| PCL 15 | 2.21 | 1.335 | 99 |
| PCL 16 | 2.14 | 1.385 | 99 |
| PCL 17 | 1.69 | 1.131 | 99 |

Table 40. Hyper-Arousal (Criterion D) Theoretical Item-Total Statistics (Items 13-17).

| PCL Item | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|
| PCL 13 | 7.94 | 15.486 | .620 | .790 |
| PCL 14 | 8.01 | 15.092 | .720 | .763 |
| PCL 15 | 7.70 | 14.683 | .629 | .787 |
| PCL 16 | 7.77 | 14.017 | .671 | .774 |
| PCL 17 | 8.22 | 17.215 | .470 | .829 |

*PCL Exploratory Factor Analysis.*

Table 41. EFA PCL Communalities.

| PCL Item | Initial | Extraction |
|---|---|---|
| PCL 1 | .541 | .282 |
| PCL 2 | .525 | .443 |
| PCL 3 | .556 | .292 |
| PCL 4 | .589 | .168 |
| PCL 5 | .631 | .477 |
| PCL 6 | .687 | .491 |
| PCL 7 | .600 | .361 |
| PCL 8 | .667 | .499 |
| PCL 9 | .677 | .515 |
| PCL 10 | .737 | .582 |
| PCL 11 | .540 | .259 |
| PCL 12 | .678 | .600 |
| PCL 13 | .656 | .469 |
| PCL 14 | .672 | .599 |
| PCL 15 | .642 | .400 |
| PCL 16 | .653 | .417 |
| PCL 17 | .600 | .411 |

Note: Extraction Method: Maximum Likelihood

Table 42. EFA PCL Total Variance Explained.

| | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|
| Factor | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 7.822 | 46.014 | 46.014 | 7.266 | 42.744 | 42.744 |
| 2 | 1.434 | 8.435 | 54.449 | | | |
| 3 | 1.195 | 7.030 | 61.479 | | | |
| 4 | .963 | 5.667 | 67.146 | | | |
| 5 | .932 | 5.482 | 72.628 | | | |
| 6 | .829 | 4.874 | 77.502 | | | |
| 7 | .716 | 4.213 | 81.715 | | | |
| 8 | .545 | 3.207 | 84.922 | | | |
| 9 | .484 | 2.849 | 87.771 | | | |
| 10 | .446 | 2.625 | 90.396 | | | |
| 11 | .372 | 2.187 | 92.583 | | | |
| 12 | .333 | 1.961 | 94.545 | | | |
| 13 | .260 | 1.528 | 96.073 | | | |
| 14 | .213 | 1.252 | 97.326 | | | |
| 15 | .168 | .987 | 98.313 | | | |
| 16 | .148 | .872 | 99.185 | | | |
| 17 | .139 | .815 | 100.000 | | | |

Extraction Method: Maximum Likelihood.

Table 43. EFA PCL Factor Matrix[a].

| PCL Item | Factor 1 |
|---|---|
| PCL 1 | .531 |
| PCL 2 | .665 |
| PCL 3 | .540 |
| PCL 4 | .410 |
| PCL 5 | .691 |
| PCL 6 | .701 |
| PCL 7 | .601 |
| PCL 8 | .706 |
| PCL 9 | .717 |
| PCL 10 | .763 |
| PCL 11 | .510 |
| PCL 12 | .775 |
| PCL 13 | .685 |
| PCL 14 | .774 |
| PCL 15 | .633 |
| PCL 16 | .646 |
| PCL 17 | .641 |

Note: Extraction Method: Maximum Likelihood[a]. One factor extracted. Four iterations required.

**Appendix G: Mercy College Demographics Fall 2001**

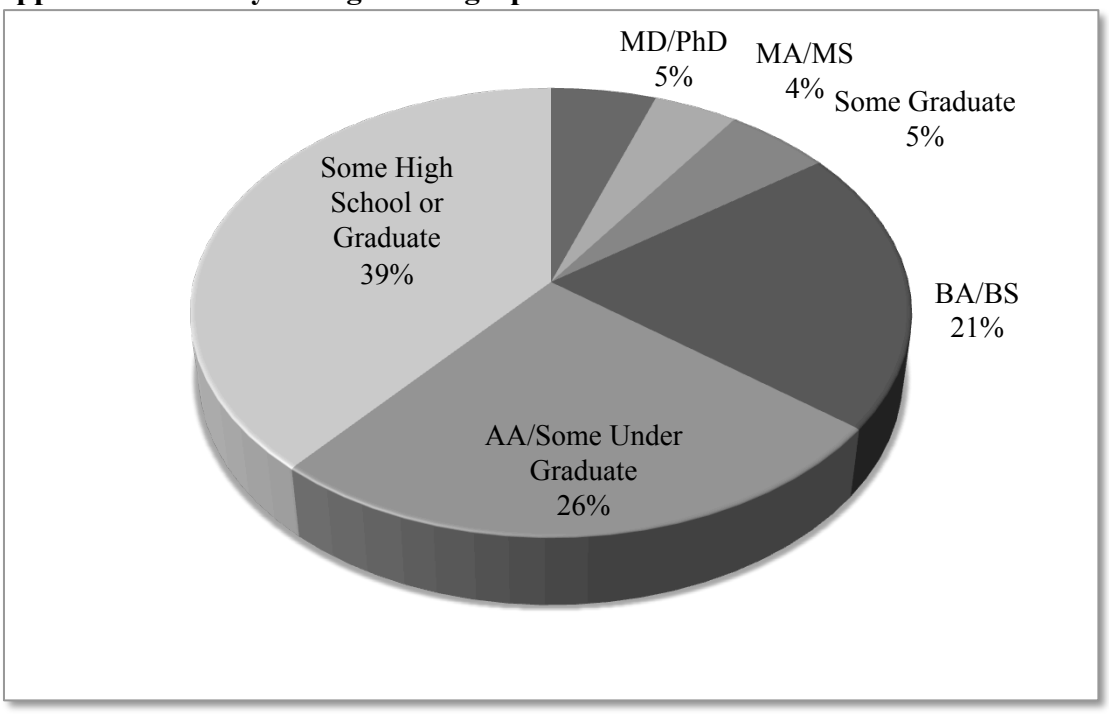


FIGURE 6. BRONX, DOBBS FERRY AND MANHATTAN CAMPUSES: HIGHEST LEVEL OF EDUCATION ACHIEVED.

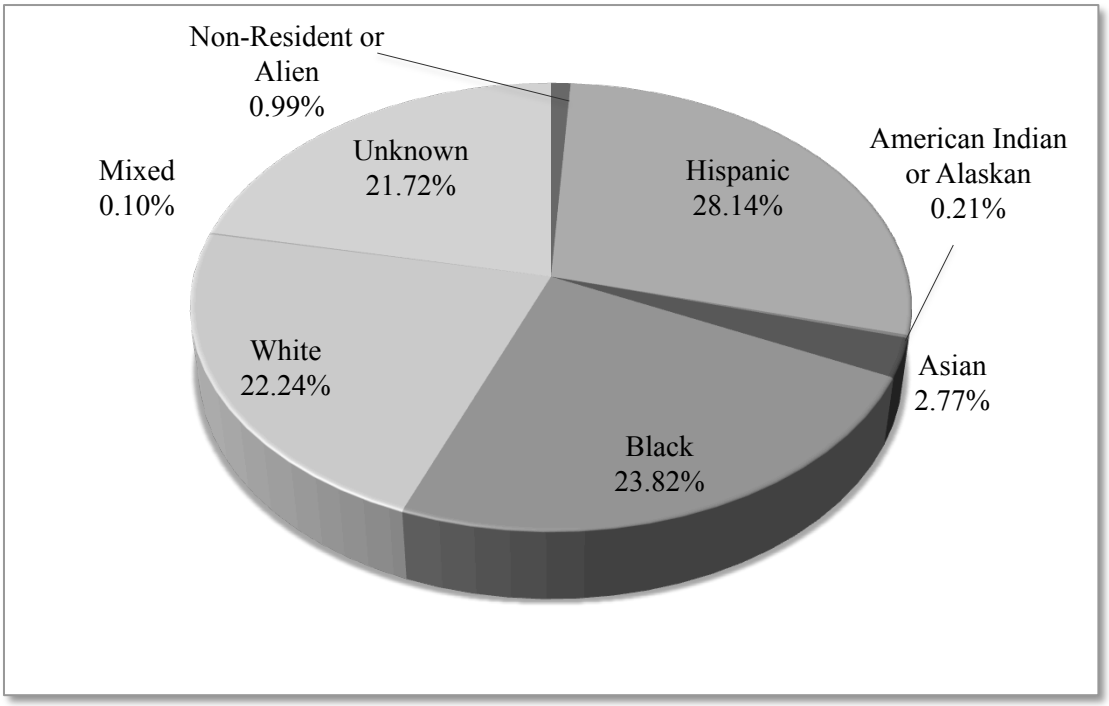


FIGURE 7. BRONX, DOBBS FERRY AND MANHATTAN MERCY COLLEGE CAMPUSES 2001: RACE AND ETHNICITY.

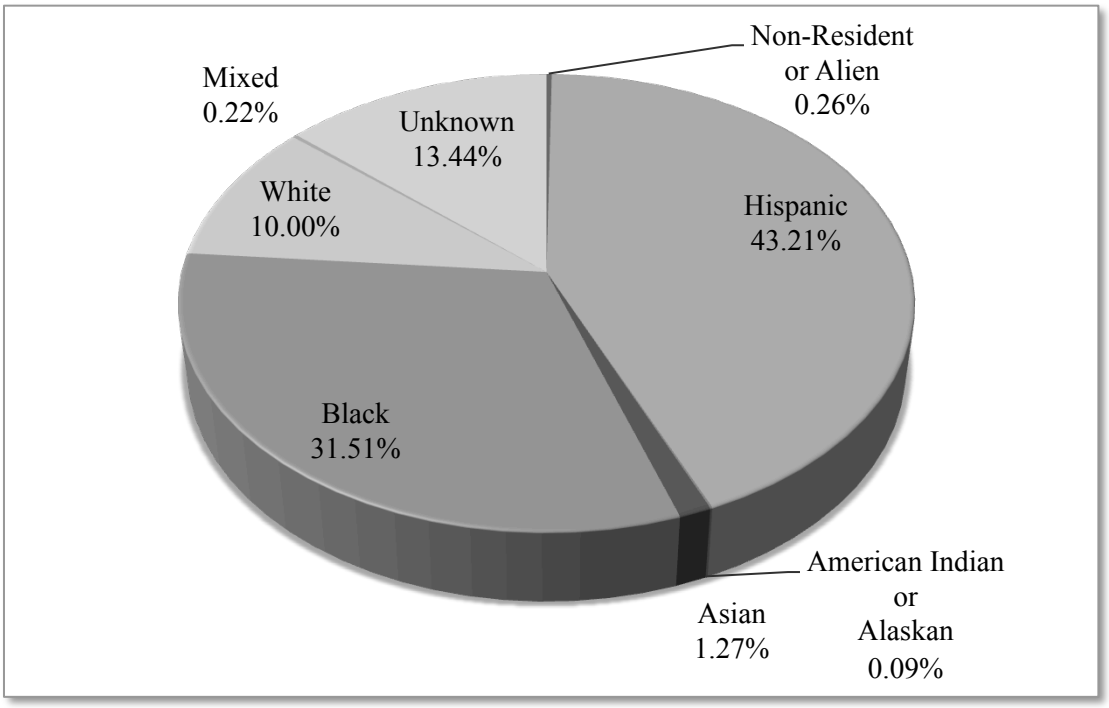


FIGURE 8. BRONX MERCY COLLEGE CAMPUS 2001: RACE AND ETHNICITY.

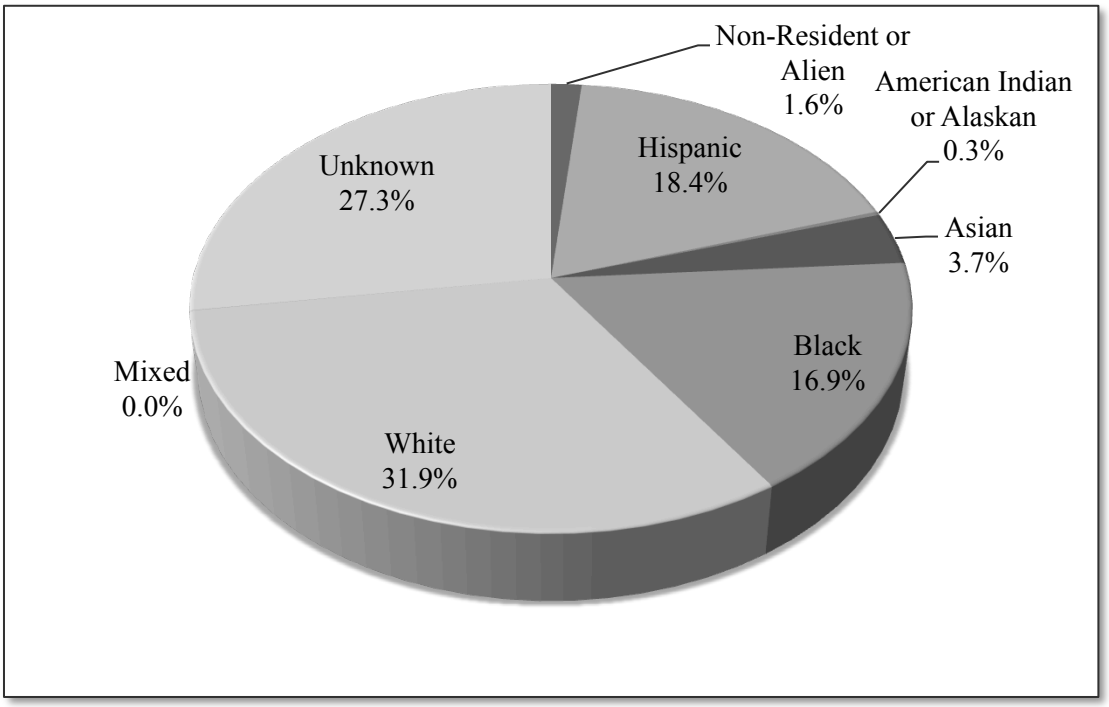


FIGURE 9. DOBBS FERRY MERCY COLLEGE CAMPUS 2001: RACE AND ETHNICITY.

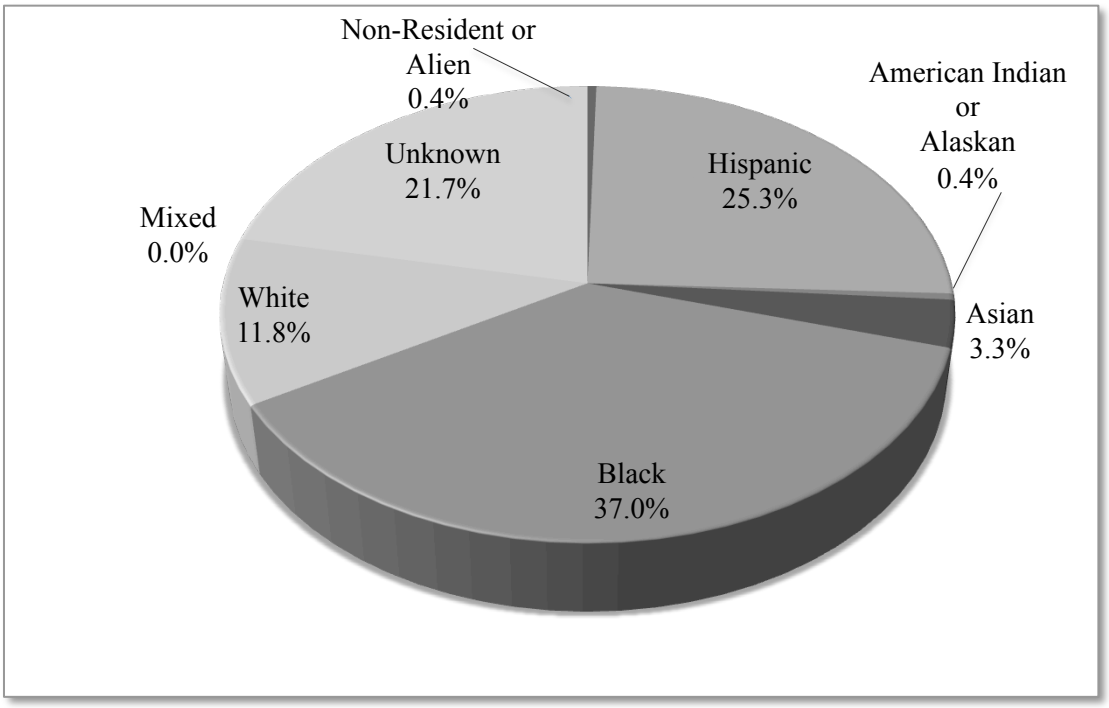


FIGURE 10. MANHATTAN CAMPUS MERCY COLLEGE 2001: RACE AND ETHNICITY.

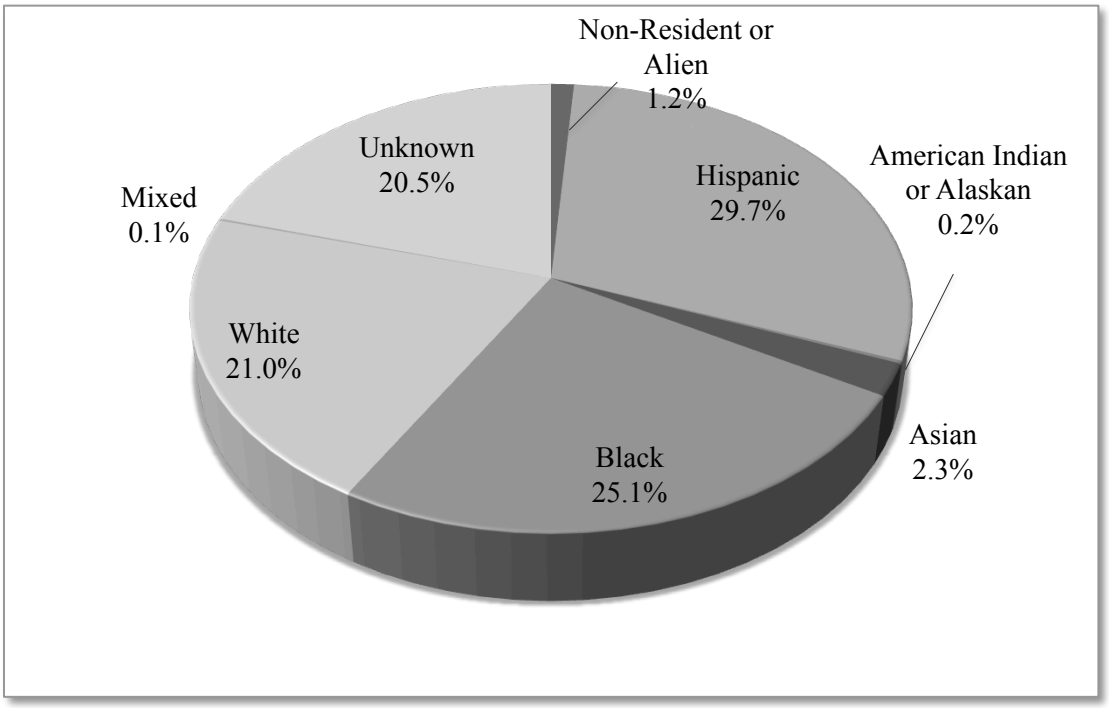


FIGURE 11. BRONX, DOBBS FERRY AND MANHATTAN MERCY COLLEGE CAMPUSES 2001: FEMALE, RACE, AND ETHNICITY.

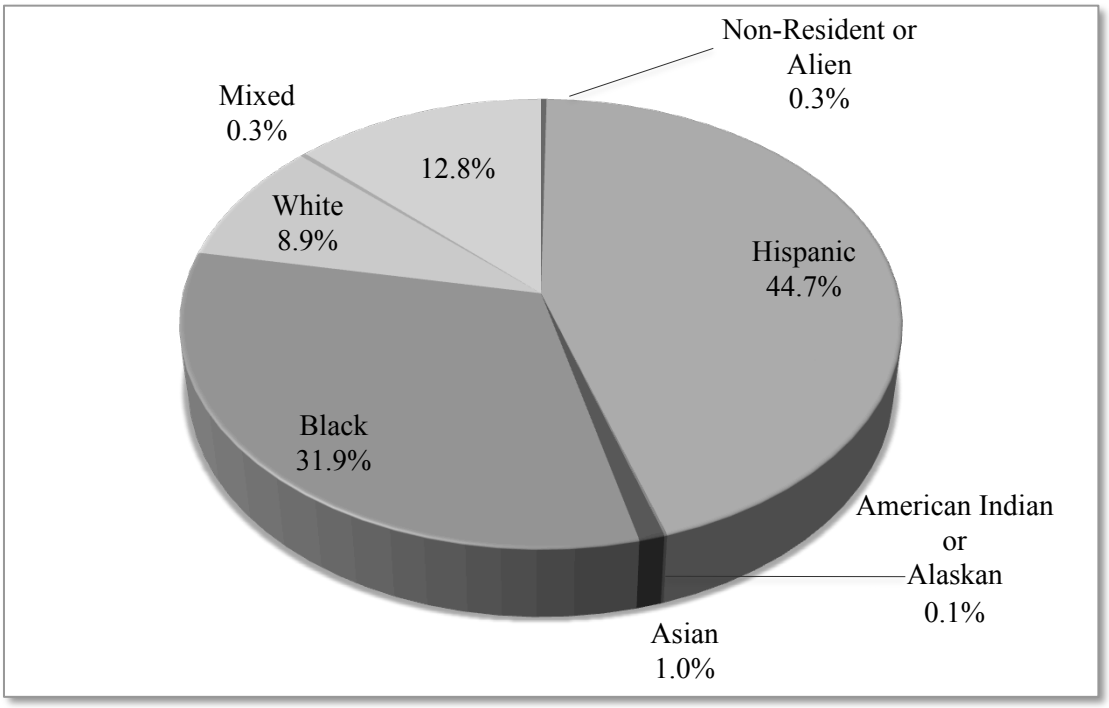


FIGURE 12. BRONX CAMPUS MERCY COLLEGE 2001: FEMALE, RACE, AND ETHNICITY.

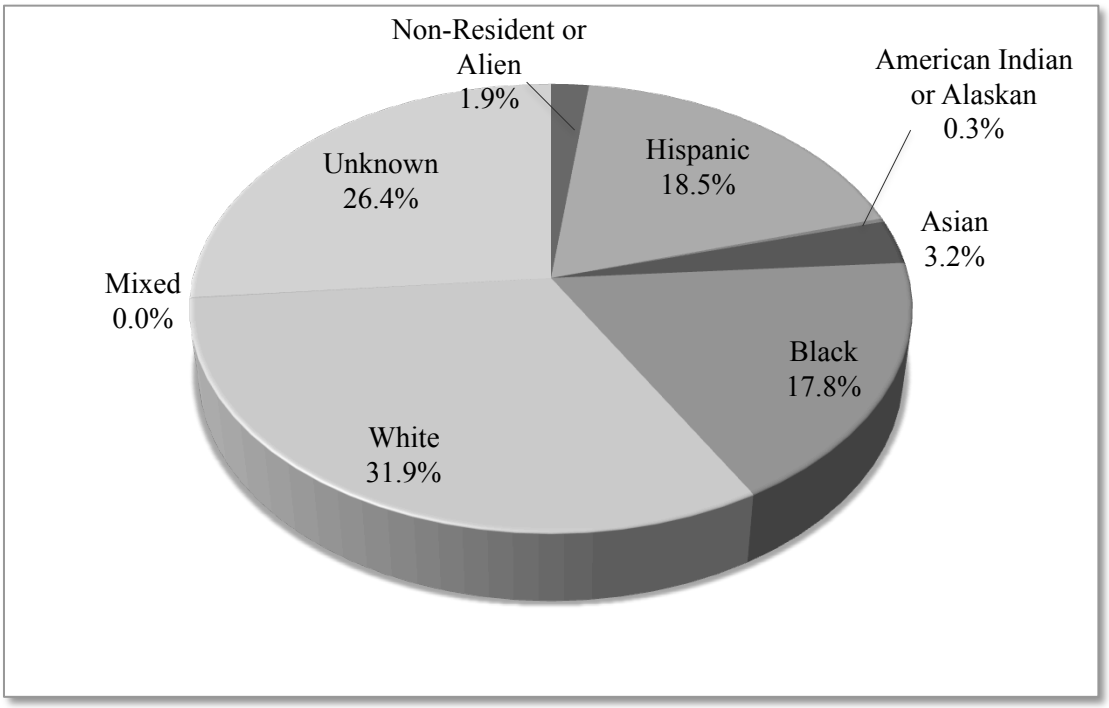


FIGURE 13. DOBBS FERRY MERCY COLLEGE CAMPUS 2001: FEMALE, RACE, AND ETHNICITY.

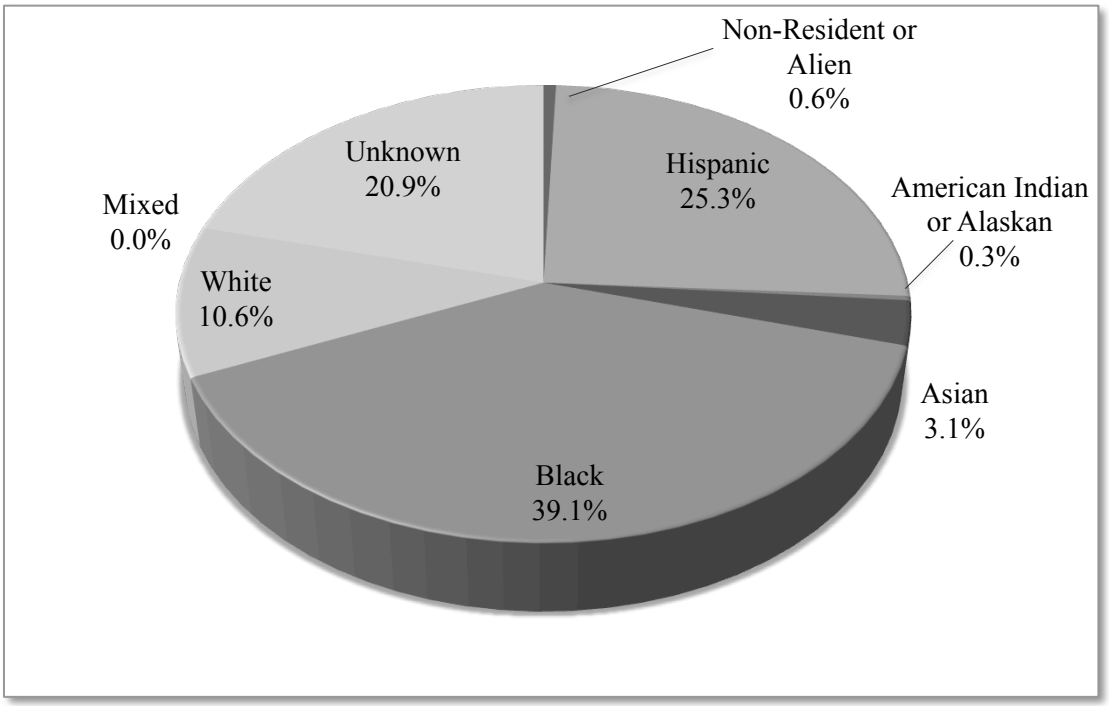


FIGURE 14. MANHATTAN CAMPUS MERCY COLLEGE 2001: FEMALE, RACE, AND ETHNICITY.

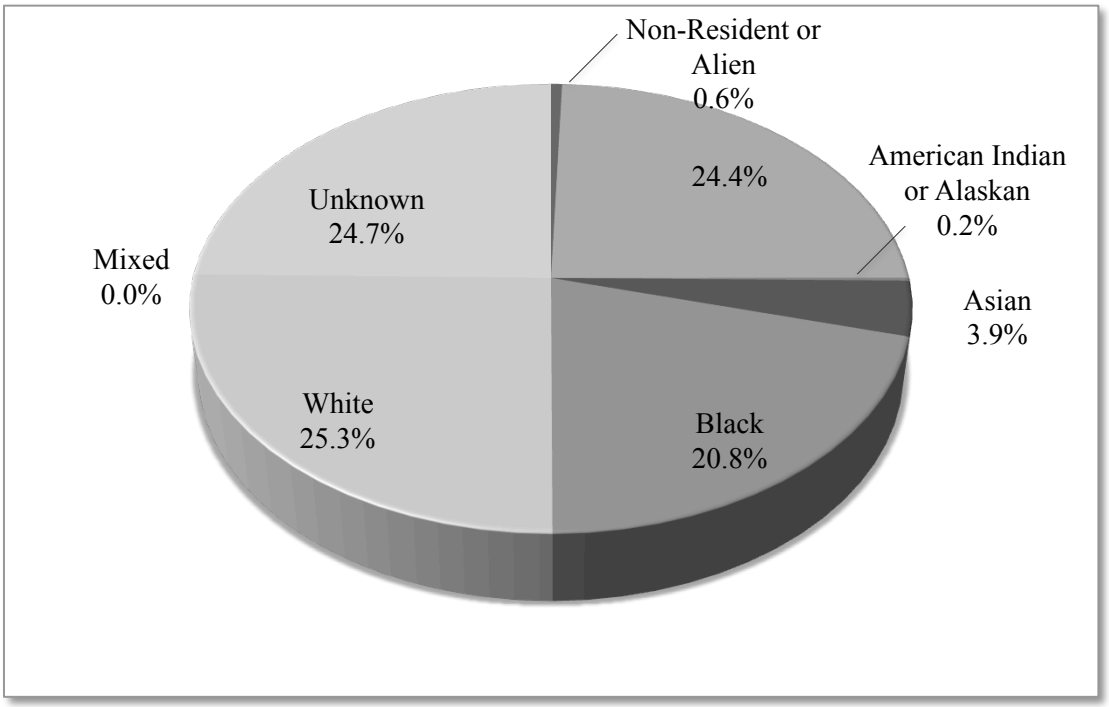


FIGURE 15. BRONX, DOBBS FERRY AND MANHATTAN MERCY COLLEGE 2001: MALE, RACE, AND ETHNICITY.

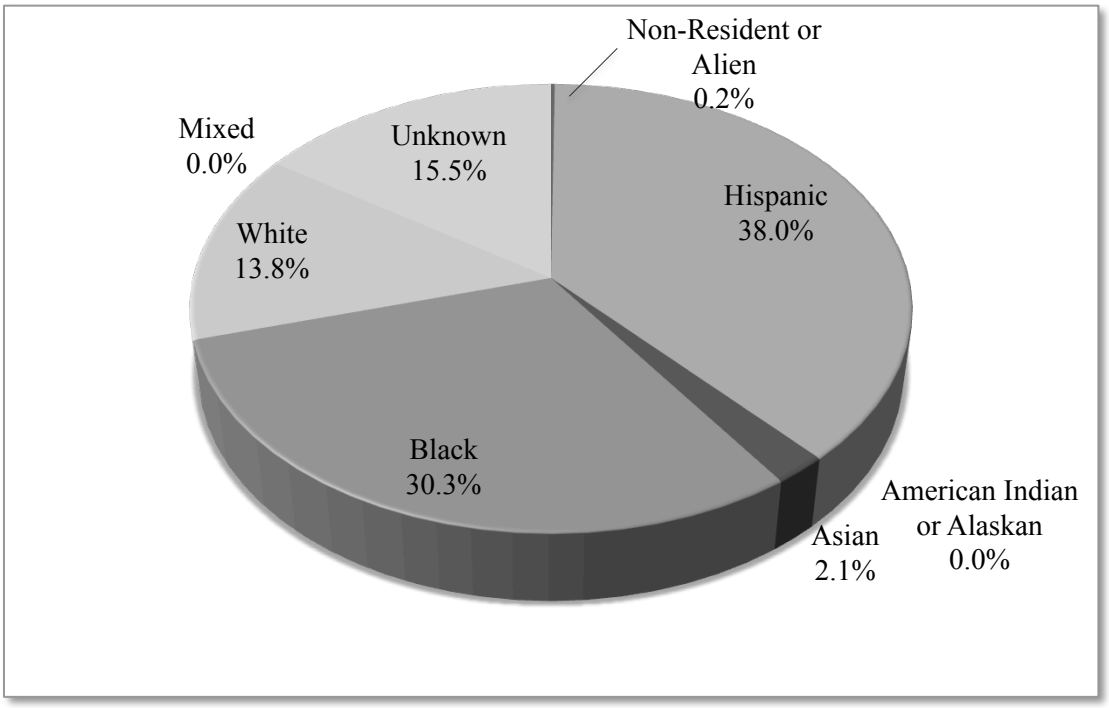


FIGURE 16. BRONX MERCY COLLEGE CAMPUS 2001: MALE, RACE, AND ETHNICITY.

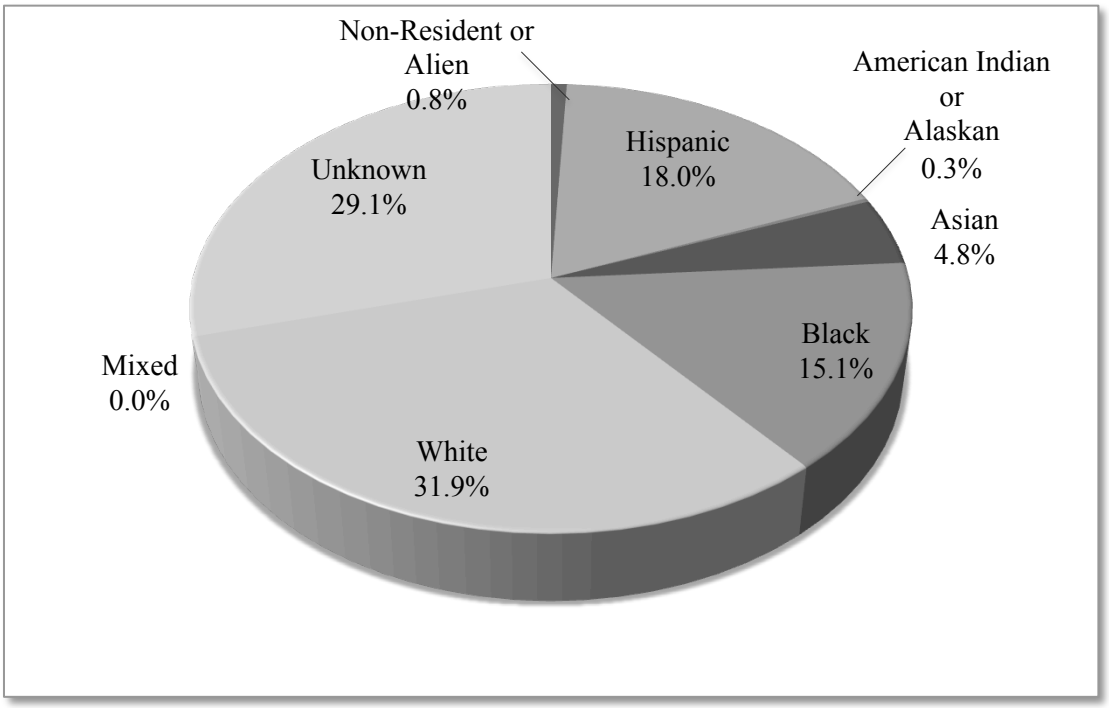


FIGURE 17. DOBBS FERRY MERCY COLLEGE CAMPUS 2001: MALE, RACE, AND ETHNICITY.

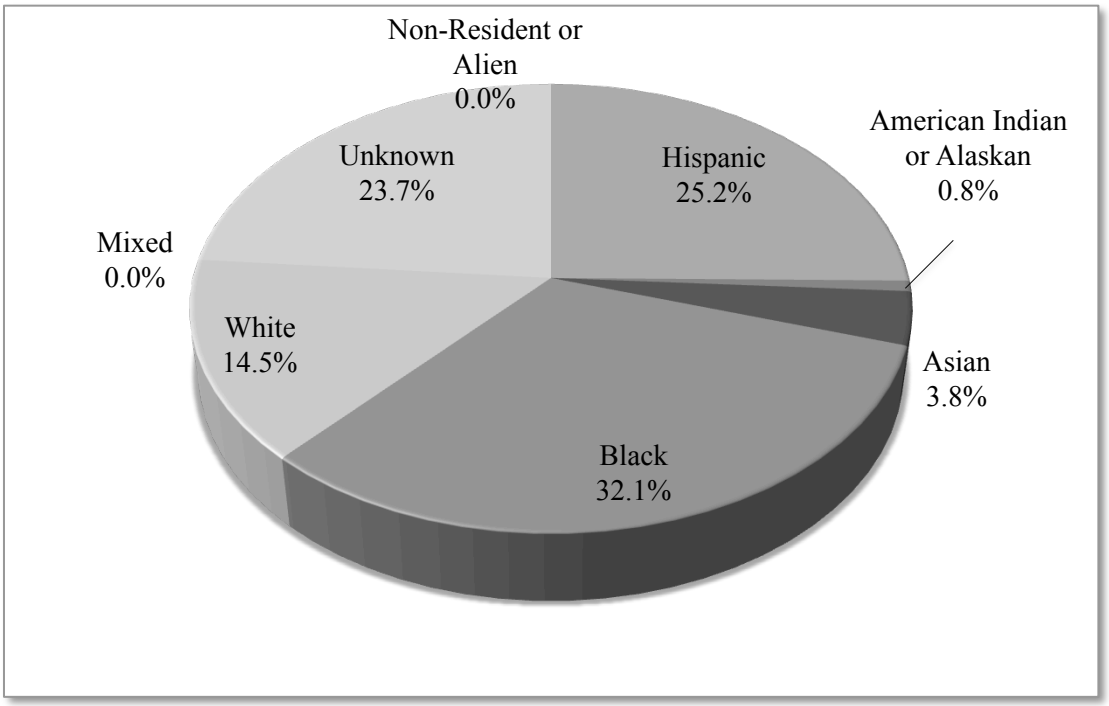


FIGURE 18. MANHATTAN MERCY COLLEGE CAMPUS 2001: MALE, RACE, AND ETHNICITY.

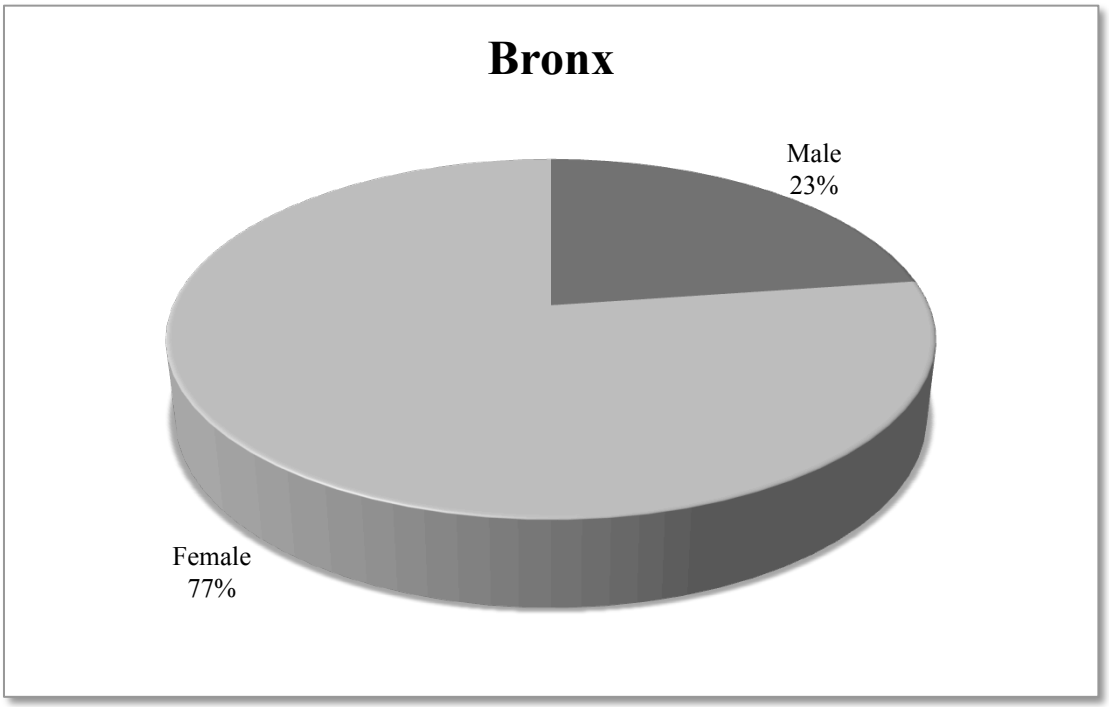


FIGURE 19. BRONX MERCY COLLEGE CAMPUS 2001: GENDER DISTRIBUTION.

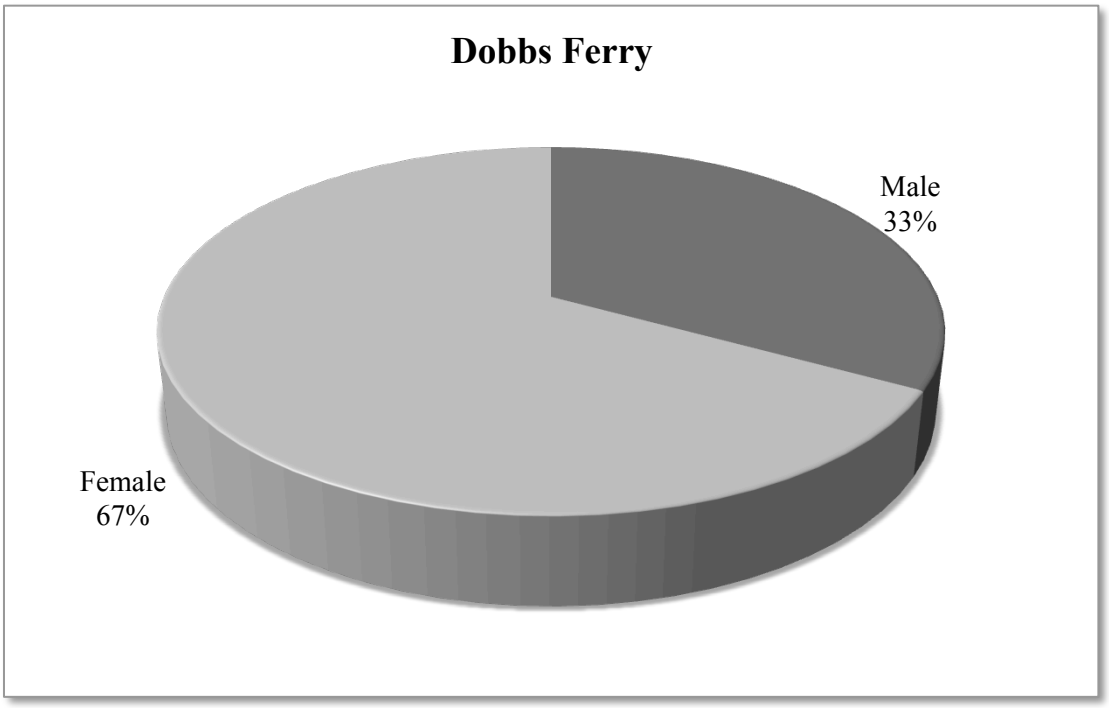


FIGURE 20. DOBBS FERRY MERCY COLLEGE CAMPUS 2001: GENDER DISTRIBUTION.

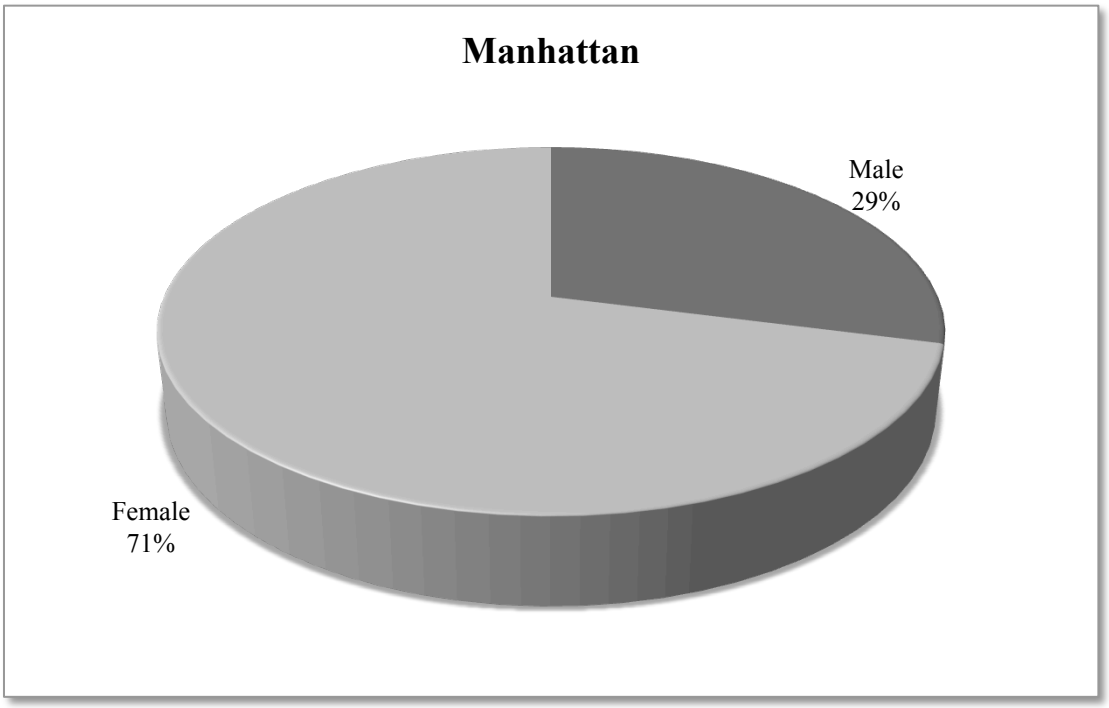


FIGURE 21. MANHATTAN MERCY COLLEGE CAMPUS 2001: GENDER DISTRIBUTION.

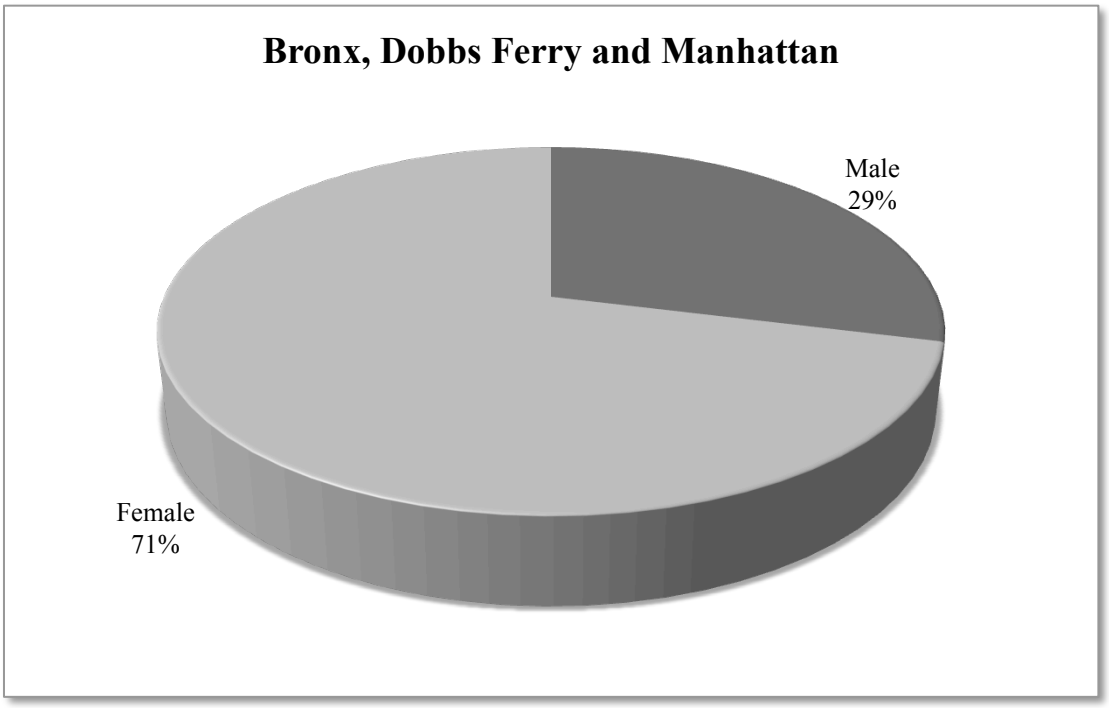


FIGURE 22. BRONX, DOBBS FERRY AND MANHATTAN MERCY COLLEGE 2001: GENDER DISTRIBUTION.

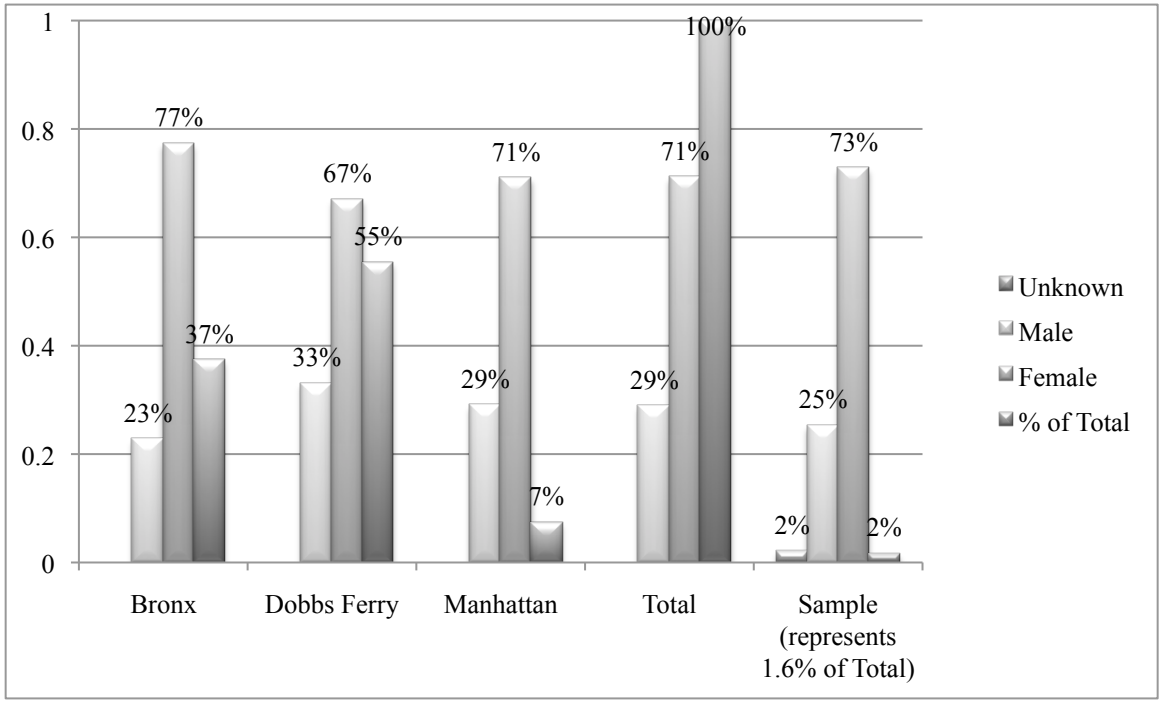


Figure 23. Gender distribution of Mercy College campuses and the sample for fall 2001.

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