

ABSTRACT

Title of Dissertation: ADJUSTMENT IN VICTIMS OF SEPTEMBER 11:
REACTIONS TO A LARGE-SCALE CIVILIAN
TRAUMA

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This study sought to examine reactions to the September 11 terrorist attacks and identify factors that could affect those reactions. Subjective well-being (SWB), impact of traumatic event, and job satisfaction served as the means of assessing adjustment to 9/11/01. It was predicted that those with better health perceptions, more positive psychological characteristics, and more social support would report better overall adjustment to the traumatic events experienced on September 11, 2001.

While few hypotheses related to job satisfaction and impact of events were significant, both the psychological variables of resiliency and optimism were predictive of SWB before, two weeks after, and one year after 9/11/01, indicating that people in this sample who perceived themselves as more resilient and optimistic also reported higher levels of SWB or seemed to be happier and have a higher quality of life.

Cluster analysis was also used to examine changes in SWB over time (before the event to two weeks after to one year after). The participants in this sample were found to

cluster into four groups. The first group's levels of SWB stayed the same, and the second's declined. The third group's SWB increased after 9/11 and eventually returned to baseline, and the fourth group's SWB increased. Resiliency and optimism were found to relate to group membership.

While many studies have demonstrated the maladaptive reactions that people have to trauma, this study provides evidence that some people actually report a higher level of SWB following a traumatic event. This study suggests that people who are more optimistic and who have higher levels of resiliency, particularly more feelings of determination and willingness to seek meaning, and fewer feelings of helplessness, will also report a higher level of subjective well-being after dealing with a traumatic event. This study is important because it provides evidence that people, specifically who are directly exposed to a traumatic event, do respond in very different ways. While some people are unaffected or negatively impacted by trauma, many others have positive outcomes (posttraumatic growth) that lead them to a greater appreciation for and more satisfaction with their lives than before the traumatic experience.

ADJUSTMENT IN VICTIMS OF SEPTEMBER 11: REACTIONS TO A LARGE-
SCALE CIVILIAN TRAUMA

by

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DEDICATION

For my mother, Ann Craig Holmes, who taught me how to love, inspired me to help others, and who's example of grace, sacrifice, caring, intelligence and faith, I will always strive to reflect. You sacrificed so much for me, so it is to you that I owe this accomplishment. I still love you more.

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Chapter 1

Introduction

The sun rises, and many challenges lie ahead. A piece of my soul rests with all those lost that day. The months pass and, as humans, we adapt. The holidays come, and coffee table books of the disaster become best sellers. Life goes on, capitalism prevails, and all but a few know and feel what we have truly lost. Innocence lost is at its best wisdom gained, and not much more.

Diane Swonk, NABE
Present in the World Trade Center
On the morning of September 11,
2001

Rarely does an event occur that forever changes a nation and leaves an indelible mark on the history and hearts of every citizen, but on September 11, 2001, when this nation was attacked by a terrorist organization, no American was left untouched and no American was left unchanged. There was a smaller group of Americans, however, who felt the trauma more immediately than the rest of the nation. Those individuals who were present in the World Trade Center towers on the morning of September 11 felt the fear and panic for their lives and safety more intensely than most others in the nation, and in the wake of this tragedy, those survivors are left to react and try to adjust to this unprecedented traumatic experience.

Previous research has clearly demonstrated that victims of trauma have a wide range of reactions that cover the scope of biomedical variables (Breslau, 2001; Clum, Nishith, Resick, 2001; Martin, Rosen, Durand, Knudson, & Stretch, 2002; Stein & Barrett-Connor, 2000; Uba & Chung, 2002) psychological variables (Brewin, Andrews, & Valentine, 2000; Gold et al., 2000; Holen, 1991; King, King, Fairbank, Keane, & Adams 1998; Lyons, 1991; Solomon, Mikulincer, & Avitzur, 1988; Zatzick et al., 1997), and social variables such as social and institutional support (Cobb, 1976; Galea et al.,

2002; Holahan & Moos, 1981; King et al., 1998; Lefcourt, Martin, & Saleh, 1984; Sandler & Lakey, 1982; Solomon et al., 1988). Moreover, biosocial variables (Breslau, 2001; Clum, Nishith, Resick, 2001; Martin, Rosen, Durand, Knudson, & Stretch, 2002; Stein & Barrett-Connor, 2000; Uba & Chung, 2002) variables such as gender also have a significant impact on traumatic reactions. Trauma survivors consistently show increased current and chronic health problems and somatization (e.g., Breslau, 2001). They can also experience depression, anxiety, and Post-Traumatic Stress Disorder (PTSD) as psychological reactions to trauma (Astin, Lawrence, & Foy, 1993; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). There is also clear evidence that social factors, such as social support, bolster individuals against PTSD symptomatology (King, King, Fairbank, Keane, & Adams 1998). Additionally, findings consistently demonstrate that women are at a greater risk of experiencing traumatic sequelae, both physical and psychological, than men (e.g., Breslau, 2001; De Marco, 2000).

Beyond exploring reactions to trauma, many researchers have sought to understand the factors that are associated to adjustment to trauma and other stressful events. Resiliency (e.g., King et al., 1998; Rutter, 1987), religion and spirituality (e.g., Harris et al., 1995; Koenig & McCullough, 2000), optimism (Scheier & Carver, 1985), coping style (e.g., Folkman & Lazarus, 1988; Solomon et al., 1988), and social support (e.g., Benight et al., 2000; King et al., 1998) have all been identified as being related to a lower incidence of distress and greater adjustment in victims of a variety of traumas.

Much has been written about trauma reactions in military populations as well as civilian groups including domestic violence, natural disaster, and previous terrorist attacks (e.g., Oklahoma City and the 1993 World Trade Center attack). However, never

before has an event occurred in the United States that involves a malicious, intentional attack on civilian American citizens that resulted in such a profound loss of life and threat to thousands of other lives. Because of the unprecedented nature of this event, there is no extant research that explores how people react to or adjust to an intentional, large-scale civilian trauma in the United States. It is imperative that the trauma of September 11 be studied to expand knowledge about various types of trauma reactions in a new population.

The purpose of this study was to examine how members of a national association who were present in the Twin Towers on September 11 have reacted and have adjusted to this traumatic event. The sample that was used for this study represents a unique group in that it includes members of a professional organization who were visiting New York to attend a professional conference. Studying this group is important for many reasons. First, the sample represents an intact group of people who shared the same event and will provide more information than a random sampling of 5-10% of a broader population who were distributed throughout the country and were not in the World Trade Centers on 9/11/01. Second, the members of this organization experienced the trauma first hand, making them direct victims of the trauma. Unlike so many other non-New York Americans who experienced vicarious trauma, these individuals were faced with an immediate personal threat that likely elicited a range of intense reactions. Finally, also unlike New Yorkers who experienced the attack, this group was forced to immediately disperse and escape the site of the trauma on their own and then return to their homes in various geographic locations. This is significant because the support environments to which these individuals were returning were distinctly different than the intact support

environment of New York where the citizens had a shared experience and where many supports such as crisis intervention and the Red Cross were available.

Specifically, this study utilized a biopsychosocial framework to investigate biomedical, biosocial, psychological, and social factors. The variables were selected based on a review of current trauma and stress literature. Biomedical variables included general health perceptions and somatic symptoms; the biosocial variable was gender; psychological variables were depression, anxiety, resiliency, optimism, and coping; and social variables included social and institutional support.

This study offers a very rare opportunity to expand current knowledge about trauma to include examining how people respond to a catastrophic terrorist attack. While we know and understand the impact of biopsychosocial reactions and factors to a variety of traumatic events, only inferences can be made about the biopsychosocial impact of intentional, large-scale, civilian traumas, such as the September 11 attacks, on individuals who directly experience such trauma. It is, therefore, imperative that this event and these victims be studied. In addition to expanding current understanding of trauma, an increased knowledge base about this event will assist mental health providers in treating both current and future victims of large-scale civilian traumatic events, such as potential, future terrorist attacks.

Chapter 2

Review of Literature

The tragic events of Sept 11 have changed the people of this nation collectively and individually. All Americans have all been impacted and most have had a variety of reactions to such a traumatic event in our homeland. For individuals present in the World Trade Center on that morning, however, the impact of the attacks has been more immediate to their lives. Prior to Sept 11, 2001, the United States had not experienced a traumatic event that so powerfully impacted its civilians on the mainland of America. For this reason, psychologists know little about the reactions of individuals to such an event and how to help people cope with their reactions. The events of September 11 provide an unusual opportunity to learn about ongoing personal reactions to trauma. Additionally, understanding these reactions can expand the knowledge of mental health professionals to assist with treatment and coping to this and future large-scale traumatic events.

It is well known that the experience of traumatic events can lead to serious psychological and physiological sequelae such as Post Traumatic Stress Disorder (PTSD), depression, and long-term physical health complications or psychosomatic symptoms related to psychological distress (e.g., King et al., 1998). Initial reports from New York City residents collected a few days after September 11 indicate that they were clearly experiencing significant stress with 44% of adult reporting at least one symptom of substantial stress (Schuster et al., 2001). In a study published in March of 2002, a prevalence rate of 7.5% was found for 9/11 related PTSD and 9.7% for 9/11 related

depression (Galea et al., 2002). Additionally, Galea et al. (2002) reported that associated covariates for both PTSD and depression included gender and social support.

These preliminary reports regarding reactions to the events of September 11 indicate that there are biosocial (e.g., gender), psychological (e.g., PTSD and depression) and social (e.g., social support) components to how people have responded to these events. While there are no data at present which reflect physiological consequences, it is likely that the distress created by 9/11 has resulted or will result in changes in health (either perceived or actual) as well as individuals experiencing of psychosomatic symptoms often associated with anxiety such as shortness of breath, numbness, and chest pains. Therefore, it is imperative that investigation of this event occurs within a framework that encompasses all of these areas. For this reason, the biopsychosocial model has been selected as the theoretical framework to organize an understanding of traumas such as September 11.

This paper will begin with a review of trauma research in general because trauma is the central component of this study. Next, individual factors related to trauma will be examined within the biopsychosocial framework. Finally, subjective well-being, job satisfaction, and the biopsychosocial model will be discussed. The main purpose of this study is to investigate the impact that biopsychosocial variables, like perception of general physical health, somatic symptoms of distress, depression, anxiety, resiliency, optimism, coping, and social and instrumental support, have on the psychological well-being, job satisfaction, and impact of traumatic event of a group of survivors of a large-scale, civilian, trauma. Job satisfaction is being included in this study because the participants for this study are members of a professional organization that was present in

the World Trade Center on September 11, 2001. They were in New York City due to their jobs and then returned to home and work at sites all over the nation.

Studying this event is complicated because gaining access to victims could be both difficult and potentially controversial in that they have just experienced a traumatic event and may not want to be approached about participating in a study. The opportunity to study this intact group of individuals is unusual in the literature that has emerged about 9/11 is rare and extremely valuable. Research has shown that assimilation can assist with adjusting to distressing events and have a positive effect on both physical and mental health (Pennebaker, 1997). Unlike New York City residents, individuals who were at the World Trade Center on 9/11/01 but do not live in New York or the surrounding area may not have had the opportunity to assimilate their experience with other people who shared the trauma. Therefore, the adjustment of these individuals may be more challenging than for those with the opportunity to assimilate the trauma. No research could be identified that examined intact groups or individuals who experienced the World Trade Center attacks but did not live in the New York City area. The majority of research has looked at people living in NYC who experienced the trauma directly or people who live throughout the country and did not experience the events directly (Fredrickson et al., 2003; Galea et al., 2002; Peterson & Seligman, 2003; Schuster et al., 2001).

Given the brevity of time since the occurrence of the event, very little has been written about the psychological and physiological reactions to that trauma, and that which has been written examines individuals who were not present but were affected indirectly, via media exposure or through a relationship to those present. For example, in a commentary on appropriate reactions to September 11, Scurfield (2002) discusses how

those not present might react to this tragedy, such as by immersing themselves in media coverage, or conversely, ignoring what has happened by not watching TV. He stated that some Americans might become more task-oriented or focused, but that more maladaptive reactions might include being emotionally labile, hypersensitive, irritable, having difficulty concentrating and falling or staying asleep.

In an additional study published two months after the attacks, Schuster et al. (2001) surveyed 560 Americans who were also affected indirectly. They found that 44% of the adults surveyed reported having one or more substantial symptom of stress, and that 35% of children in the surveyed homes had one or more symptom of stress despite the fact that 34% of parent's surveyed reported restricting their children's viewing of the media coverage. Additionally, Schuster et al. (2001) found that most people (98%) were coping by talking with others, which indicates that social support is likely a key component in how individuals dealt with their reactions. In March of 2002, Galea et al. reported a survey of 1008 New Yorkers. They found prevalence rates of 7.5% for PTSD, 9.7% for depression, and 3.7% for individuals who met criteria for both disorders. Four and eight tenths percent of men reported PTSD while 9.9% of women reported PTSD. Additionally, 7.3% of men reported depression and 12% of women reported depression. In this survey, covariates of PTSD and depression included gender, social support and number of stressors in the 12 months prior to September 11, 2001.

While understanding how this event has affected the average American citizen is extremely important, this initial commentary and survey studies do not address the reactions and adjustment of people who were present at the Towers that morning or how the direct traumatic exposure has affected their lives. This literature only provides initial

prevalence rates and does not examine long-term effects or factors that could potentially lessen the impact of the trauma. Clearly, research is needed to understand the on-going reactions of those who experienced this trauma first hand, especially those who did not have the opportunity to assimilate their experience with other victims on a frequent or daily basis. For this reason, this study will explore the reactions and adjustment of a group of individuals who were direct victims of the trauma of September 11, 2001.

Traumatic reactions

While few would argue that such a terrorist attack is not a traumatic and distressing event, for the purpose of this study, it seems as though reviewing the definitions of trauma would be helpful. The DSM-IV (1994) contains two primary diagnoses to describe the sequelae of victims of trauma: Posttraumatic Stress Disorder (PTSD) and Acute Stress Disorder. The primary distinguishing factor between these diagnoses is the duration of symptom presentation, with PTSD consisting of symptoms persisting more than a four-week period and Acute Stress Disorder consisting of symptoms that persist more than two days but abate within four weeks. One of two primary criteria for both disorders includes “an extreme traumatic stressor involving direct personal experience of an event that involves actual or threatened death or serious injury or other threat to one’s physical integrity; or witnessing an event that involves death, injury, or a threat to the physical integrity of another person...” (DSM-IV, 1994, p. 424). Additionally, this experience must be accompanied by intense fear, feelings of helplessness, and/or horror (DSM-IV, 1994). While formal diagnosis of both PTSD and acute stress disorder include many other criteria, it is likely that a sizable number of the

people present in or near the World Trade Center Towers on September 11, 2001 would satisfy the two primary criteria presented.

Biopsychosocial model

This brief overview of trauma shows that reactions to stressful or traumatic events are associated with both biological and psychosocial variables (Breslau, 2001; Clum, Nishith, Resick, 2001; De Marco, 2000; Foa & Street, 2001; King, King, Fairbank, Keane, and Adams, 1998; Martin et al., 2002; Purves & Erwin, 2002; Stein & Barrett-Connor, 2000; Uba & Chung, 2002; Zlotnick, Zimmerman, Wolfsdorf, & Mattia, 2001). For this reason, a biopsychosocial perspective has been selected as the theoretical underpinning for this study. The biopsychosocial model was first introduced by Engel (1977, 1980), and was a radical shift from the traditional biomedical approach to health. Engel (1977, 1980) suggested that health was actually an interplay of biological, psychological and social factors. He conceptualized the biopsychosocial model as a hierarchical progression from least to most complex. While this model certainly broadened the current understanding of health and challenged the well established biomedical approach to health, Hoffman and Driscoll (2000) have criticized the hierarchical nature of the model because it may indicate the importance of one set of factors over others.

To address this problem, Hoffman and Driscoll (2000) proposed a concentric biopsychosocial model. They chose the term “health status” over “disease” in order to capture the range of health including both positive and negative, representing a continuum from total illness to total wellness. The authors wanted to emphasize that this model looks at what leads to wellness rather than what leads to disease. In the actual

model, Hoffman and Driscoll (2000) placed health status at the center of the circle. Psychosocial contributors are closest to health status in the model because psychological factors have been shown to moderate the effects of medical factors such as the role of social support in buffering the stressful impact of disease. Biosocial contributors are in the next layer and are factors that have a biological basis, but are also rooted in social construction such as the variable, gender. Biomedical contributors are in the outer circle and include factors such as genetics and disease. They are more fixed and therefore more difficult to modify.

The biopsychosocial model (Engel, 1977, 1980; Hoffman & Driscoll, 2000) will specifically be used in this study to examine adjustment as measured by subjective-well being, job satisfaction, and impact of traumatic event. As previously mentioned, the biopsychosocial model includes broad domains of health, social measures, and psychological measures. Some examples of variables in each domain might be physical symptoms of distress for the health domain, both general social support and institutional support for the social domain, and measures of coping style and perceived resiliency for the psychological domain. It is expected that each of the aspects of the biopsychosocial model will contribute to how the participants are coping and how well they have adjusted over time.

Biomedical aspects of trauma. Individuals who experience trauma often have lasting effects, which impact both psychological and physical health (King, King, Fairbank, Keane, & Adams, 1998). Psychological impacts will be discussed in the following section. Physiologically, it has been consistently demonstrated that the experiencing of traumatic events is often related to increased health problems (Breslau,

2001; Clum, Nishith, Resick, 2001; Martin, Rosen, Durand, Knudson, & Stretch, 2002; Stein & Barrett-Connor, 2000; Uba & Chung, 2002). Kulka, Schlenger and Fairbanks (1990) as cited in King et al. (1998) reported that veterans with PTSD were more likely to indicate the presence of current and chronic physical health problems than other veterans without PTSD. In another study of 573 female and 555 male soldiers in which 92% of women and 91% of men had experienced a traumatic event, the authors found that the number of traumatic events was related to long-term health problems indicating a cumulative effect of trauma on health (Martin et al., 2002).

Similar findings exist in non-military samples. In a group of 590 Cambodian refugees who experienced trauma in Cambodian refugee camps, trauma was related to physical health. Specifically, number of traumas was predictive of perceptions of physical health (Uba & Chung, 2002). In another study of older men and women who had experienced sexual assault, both men and women were at increased risk for certain diseases (Stein & Barrett-Connor, 2000). For example, the women showed an increased risk for arthritis and breast cancer while the men showed an increased risk for thyroid disease. Clum, Nishith, & Resick (2001) suggested that sleep disturbances related to traumatic experiences and development of PTSD could be one cause of physical health problems in trauma victims. In a group of female rape victims, the authors confirmed that trauma-related sleep disturbance did account for significant variance in physical health symptoms.

In many studies physical health symptoms are not clearly divided into documented illness versus somatization. However, it is important to note that somatization is a significant problem for individuals who have experienced trauma and

have PTSD. Breslau (2001) reports that she has seen a relationship between somatization symptoms and PTSD. In a previous study, she and her colleagues (Adreski, Chilcoat, & Breslau, 1998) found that people with PTSD reported 3 times as many symptoms associated with somatization than individuals without PTSD. Additionally, there was a gender difference in that women with PTSD tended to report twice as many symptoms than men with PTSD (Adreski, Chilcoat, & Breslau, 1998).

Biosocial aspects of trauma. Beyond the biomedical effects of trauma, biosocial factors such as gender also play a role in the experiencing of symptoms of Acute Stress Disorder or PTSD. Findings consistently demonstrate that women are at a greater risk of experiencing traumatic sequelae, both physical and psychological, than men (Breslau, 2001; De Marco, 2000; Foa & Street, 2001; Martin et al., 2002; Purves & Erwin, 2002; Zlotnick, Zimmerman, Wolfsdorf, & Mattia, 2001). Breslau (2001) reports a 2:1 female to male lifetime prevalence of PTSD. Zlotnick et al. (2001) reports that women are more likely than men to meet criteria for PTSD. In general, women often report more re-experiencing symptoms than men, but men have a higher incidence of substance abuse and antisocial personality disorder, comorbid to PTSD. Also, although causal explanations are not available, some suggest that this may be due to differences between the genders in reporting general effects of trauma or the manner in which distress is exhibited. For example, women may repetitively discuss the trauma or ruminate on the experience. This can cause the consolidation of the traumatic memory (Henig, 2004), which can inhibit working through the memory. In another study, Purves and Erwin (2002) examined a student population. They found that, although men reported a higher incidence of traumatic events, women were 3 times more likely to experience

posttraumatic stress. These authors suggested that factors such as stage of development, intensity of trauma, and personal coping mechanisms may moderate the occurrence of posttraumatic stress, but the reason for this clear gender difference is largely unknown. Further exploration of the biosocial aspect of trauma is clearly needed.

Psychological effects of trauma and stressful life events. The psychological effect of trauma exposure can be profound in that many trauma victims will develop traumatic stress reactions (which can lead to PTSD) and often experience other psychological comorbidity (Breslau, 2001). For example, survivors of the 1980 North Sea oilrig collapse displayed significant elevations in the prevalence of psychiatric disorders up to 8 years after the event (Holen, 1991; King et al., 1998). Similarly, Green, Lindy, Grace, and Leonard (1992) examined survivors of a dam collapse and found that 14 years post event, victims were still reporting symptoms of distress such as depression and PTSD. Studies of the Three Mile Island disaster also revealed that area residents had elevated scores on various measures of depression, anxiety, and physical complaints when compared to a control group (Baum, Gatchel, & Schaeffer, 1983; Davidson & Baum, 1986). Some psychological sequelae reported by victims of interpersonal violence, a more personal form of trauma, include depression, suicide attempts, somatic complaints, and nightmares (Astin, Lawrence, & Foy, 1993; Astin et al., 1995; Browne, 1993); anxiety and memory loss (Astin et al., 1993; Astin et al., 1995); social withdrawal, intense startle responses, and affective numbing (Astin et al., 1995; Browne, 1993); and re-experiencing the trauma (Astin et al., 1993; Astin et al., 1995; Valentiner et al., 1996). Depression and PTSD reactions are also identifiable in rescue workers and law enforcement officers exposed to destruction, life-threatening situations and mutilation

(Fullerton et al., 1992; Gersons, 1989; Regeher, Hill, Glancy, 2000). While the sample for this study did not directly experience interpersonal violence or an accidental disaster, it is possible that victims of terrorist attacks experience similar psychological sequelae to victims of other types of trauma such as that of interpersonal violence or accidental disaster.

PTSD and other psychological distress among military personnel are also well documented (Brewin, Andrews, & Valentine, 2000; Gold et al., 2000; Lyons, 1991; Solomon, Mikulincer, & Avitzur, 1988; Zatzick et al., 1997). In the National Vietnam Veterans Readjustment Study (Kulka et al., 1990 as cited in King et al., 1998), 15.2% of male veterans and 8.5% of female veterans met criteria for PTSD 10-20 years after their service commitment. Overall, the National Comorbidity Survey (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995) demonstrated that, irregardless of type of traumatic experience, PTSD persists over many years for 1/3 of all diagnosed individuals, with a 7.8% lifetime prevalence rate.

Trauma in military populations

Evidence clearly indicates that people exposed to trauma have distinct and lasting psychological reactions. In a study of functioning and quality of life in a sample of male veterans, Zatzick and his colleagues (1997) found that veterans with PTSD reported diminished levels of well-being, fair or poor physical health, unemployment, and physical limitations in comparison to veterans without PTSD. The question that remains is what factors impact the presence and duration of psychological sequelae? As previously stated, a majority of trauma research including examination of factors that affect

traumatic reactions has been conducted on military personnel who experienced trauma in combat.

Many factors have been identified as impacting levels of traumatic symptomatology in combat veterans. In one study, King, King, Fairbank, Keane, and Adams (1998) examined resiliency, social support, other stressful life events and PTSD in male and female Vietnam veterans. They studied Kobasa's (1979) hardiness construct, effects of social support (structural and functional), additional stressful life events, and war zone stressor dimensions (exposure to traditional combat experiences, exposure to atrocities or episodes of extraordinarily abusive violence, perceptions of threat or harm to personal safety, and discomfort of the harsh and malevolent environment). The results of this project found that hardiness had a direct negative relationship with PTSD for both men and women veterans. Social support also was found to be related to PTSD, specifically with structural social support (size and complexity of social network) predicting functional social support ("perceived emotional sustenance and instrumental assistance") predicting severity of PTSD. In other words, levels of social support affected severity of PTSD symptomatology. Additional stressful life events had both direct and indirect (through functional social support) effects on PTSD. King et al. hypothesized that stressful life events tend to deplete both interpersonal and intrapersonal resources, which would exacerbate PTSD symptomatology. Finally, King and colleagues found that war zone stressor dimensions played an important role in PTSD. In women, exposure to combat was as strong an indirect predictor of PTSD as were hardiness and functional social support. Participants' perception of malevolent environment also had an

indirect relationship to PTSD through perceived threat and hardiness for both men and women.

This study clearly indicates that hardiness, social support, other stressful life events, and the degree of war zone stressors (or situational stressors during the trauma exposure) are related to the presence of PTSD in the specific trauma population of veterans. However, one drawback of the current research was that the data was drawn from a general dataset collected for a variety of research studies. Participants were interviewed for over 5 hours each, to obtain information for this general database. Therefore, there was little control for measurement error such as order effect or random responding and the authors do not address the potential for burnout during such an extensive interview process. Additionally, adequate information about the content of the interview verses self report measures is not provided. Finally, the authors do not acknowledge the underlying problem of over-reporting in the veteran population due to the secondary financial gain of potential service connection.

Another study by Solomon et al. (1988), examined the relationship of locus of control, coping and social support in combat related PTSD at two points in time (2 and 3 years post event). The sample consisted of 262 Israeli soldiers who fought in the 1982 Lebanon war. They defined internal locus of control as an individual's attribution that environmental events are within their control or power and external locus of control as the attribution that events are out of the individual's control. Because previous research suggests that internal locus of control is related to less severity in psychiatric disorders (Lefcourt, 1976 as cited in Solomon et al., 1988), Solomon et al. (1988) expected internal locus of control to be related to fewer symptoms of PTSD. Coping was conceptualized as

having a problem-focused function and an emotion-focused function. Because research has demonstrated that emotion-focused or intrapsychic coping tends to be more highly associated with depression (Billings & Moos, 1981; Folkman & Lazarus, 1980; Pearlin & Schooler, 1978), the authors hypothesized that a coping style with a greater emphasis on intrapsychic coping will be more highly associated with greater PTSD severity. Finally, greater social support has been found to be related to less psychological disturbance (Cobb, 1976; Holahan & Moos, 1981), and social support seems to be more effective at mediating distress with internal locus of control orientation (Lefcourt, Martin, & Saleh, 1984; Sandler & Lakey, 1982). Therefore, Solomon et al. (1988) predicted that social support would have the greatest impact on PTSD with those reporting an internal locus of control. Interestingly, Solomon et al. (1988) did not attend to the body of literature that addresses the role of controllability in whether or not people select emotion-focused or problem solving coping strategies. It has been suggested that type of coping strategy selected may be dependent on how controllable the situation is appraised to be by the individual (Folkman & Lazarus, 1980; Folkman et al., 1986). Additionally, research has also shown a strong relationship between coping and social support, which is largely ignored by the authors (Ingledeu, Hardy, & Cooper, 1997; Lazarus & Folkman, 1984; Thoits, 1986; Valentiner, Holahan, & Moos, 1994).

Those limitations considered, the authors found that the intensity of the PTSD symptomatology decreased over time and that locus of control was more internal, less emotion-focused coping, and more perceived social support was present as PTSD levels decreased. As hypothesized, internal locus of control was related to less PTSD intensity. Also, the emotion-focused coping style was associated with more PTSD, as was less

reported social support. However, the hypothesized interaction of locus of control and social support was not upheld. The authors suggested that this could be the result of a measurement problem. However, it may simply show that social support acts independently of locus of control. The results of this study do clearly indicate that internal locus of control, less emotion-focused coping, and higher levels of social support are related to lower levels of PTSD in combat veterans. Despite the authors lack of attention to the role of controllability in selection of coping style, it should be noted that the findings of this study are consistent with other findings that the greater the sense of controllability an individual feels, the less they are likely to rely on emotion-focused coping (Conway & Terry, 1992; Folkman & Lazarus, 1980; Folkman et al., 1986; Lazarus, 1993; Valentiner, Holahan, & Moos, 1994).

In sum, extant literature on factors affecting PTSD reactions in veterans, demonstrates that certain variables may play an important role. King et al (1998) showed that hardiness, social support, previous life exposure to stress, and environment of stressful event all may be predictive of later PTSD symptomatology. Solomon et al (1988) substantiated King et al's finding that social support is significant for trauma victims, and they also added the idea that internal locus of control and less emotion-focused coping may also be related to reduced incidence of trauma symptoms. Of course, while these findings are strong, they must be viewed cautiously as these studies had both conceptual and measurement limitations.

Trauma related to terrorism in the civilian population

While we know some factors that predict traumatic reactions in combat veterans, this information may not be generalizable to civilian populations (Brewin et al., 2000).

In a meta-analysis examining factors related to PTSD, Brewin et al. (2000) reviewed 77 articles, 28 based on military samples and 49 on civilian samples who experienced trauma during adulthood (e.g., crime victims, motor vehicle accident victims, victims of terrorist attacks, burn victims, etc...). These authors examined 14 risk factors (many of which were demographic): gender, age at trauma, socioeconomic status (SES), education, intelligence, race, previous psychiatric history, reported abuse in childhood, reports of other previous traumatization, other adverse childhood factors, family psychiatric history, trauma severity, post-trauma life stress, and post-trauma social support. Interestingly, the authors determined that only psychiatric history, childhood abuse, and family psychiatric history were consistently related to PTSD in both the civilian and military samples (Brewin et al., 2000). This indicates that factors predicting PTSD for the most part are not homogeneous across samples exposed to different types of trauma. For this reason, it appears necessary to examine factors related to trauma in specific samples to gain understanding for reactions to a particular trauma exposure in a particular group. The methodology for this analysis is strong in that the exclusion criteria for articles were stringent. Additionally, they had two raters review 20 articles to check that the articles correctly adhered to the exclusion criteria. The article could have been strengthened by rating all included articles to confirm appropriateness for the meta-analysis.

The World Trade Center and Oklahoma City. Although there have been no previous terrorist attacks in the United States that match the magnitude of September 11, 2001, examining the reactions of victims of other terrorist attacks like the first World Trade Center bombing and the Oklahoma City bombing may enlighten researchers on possible individual responses and coping reactions of September 11 victims. Gidron

(2002) describes terrorism as acts aimed “at eliciting collective fear, panic, and ‘terror’ to achieve political goals” (p. 118). In a general review of the effects of terrorist attacks, Gidron (2002) states that many models of stress highlight the importance of perceived controllability, coping style, pessimistic attitude, social support, and additional stressors in affecting outcome (e.g., sadness). In a review of six studies, he found that the prevalence of PTSD following terrorist attacks was 28.2%. However, he reported no consistent pattern of risk factors among the studies reviewed, and he indicated a need for further elucidation of risk factors for poor adjustment in victims of terrorist attacks. Additionally, his work is not empirical and it only examines six articles. Therefore, his findings must be interpreted with caution and seen as a representation of the need for additional research on PTSD and terrorism.

The two most memorable terrorist attacks in the US prior to 9/11 were the 1993 World Trade Center attack and the 1995 bombing of the Alfred P. Murrah Federal Building in Oklahoma City. Surprisingly, little has been written about psychological sequelae and risk factors associated with the first World Trade Center bombing. One case report characterized reactions of 8 victims as experiencing feelings of intense fear and anger and feelings of loss of control and vulnerability greater than ever felt previously (Ofman, Mastria, & Steinberg, 1995). While such a description is helpful in creating a general clinical picture, Ofman et al. (1995) offer no empirical findings or reactions, nor do they explore factors that might contribute to adjustment. Research on the Oklahoma City Bombing is more extensive. North et al. (1999) examined psychiatric disorders among survivors of the bombing. Their sample included 182 adults who were directly exposed to the blast. The incidence of psychiatric diagnosis

was rather profound in that half of the sample met criteria for one or more diagnosis. Interestingly, women seemed more vulnerable to pathology than men with higher percentages of PTSD (45% for women, 23% for men), major depression (32% for women, 13% for men), and generalized anxiety disorder (9% for women, 0% for men). Overall, 55% of women qualified for a post-disaster diagnosis whereas only 34% of men qualified. Previous research indicates that pre-disaster psychiatric diagnosis may predict post-disaster diagnosis (Brewin et al., 2000), and this finding was supported by North et al. (1999). However, they also found that 74% of participants experiencing PTSD and 56% of those with major depression had no prior history of those diagnoses. Of additional interest, this study also revealed significant comorbidity of depression with PTSD. Sixty-three percent of the PTSD cases also reported some other psychiatric disorder with 55% occurring with major depression. Of greatest import is how the presence of the diagnoses has impacted the lives of the participants. North et al. (1999) found that more than half of those with the sole diagnosis of PTSD and most with comorbid diagnosis reported that their symptoms were interfering with life activities, and having negative impacts on both work performance and personal relationships.

While this study provides good information on the effect of a civilian trauma, one must acknowledge that the prevalence rates of psychiatric diagnoses were extremely high. Normal incidence of PTSD in community-based studies revealed a lifetime prevalence ranging from 1-14% with variation accounted for by method of assessment and the population sampled. Studies of at risk individuals such as combat veterans show prevalence rates from 3-58%. Normal incidence for Major Depression in community based samples a lifetime risk of 10-25 % for women and 5-12% for men and is unrelated

to ethnicity, education, income or marital status. (APA, 1994). Furthermore, the data was gathered via interview and the authors fail to acknowledge the potential for interviewer bias in that the interviewers were looking for symptoms and could have indirectly and unintentionally influenced participants to respond more affirmatively. Additionally, this research does not examine contributing or buffering factors (such as resiliency, social support or optimism), but only reports incidence of psychiatric diagnosis.

Extant research on factors that were related to PTSD or other psychological distress following the bombing varies across a number of studies. Tucker, Dickson, Pfefferbaum, McDonald, and Allen (1997) found that peritraumatic reactions, or those reactions occurring at the time of the event, were predictive of continued distress symptoms six months following the event. Of particular significance was a positive endorsement of the items that indicated the experience of significant anxiety at the time of the event and being upset by the reactions of others. While an anxious reaction is rather clear to understand, the authors admit that interpreting what was meant by being upset by the actions of others is more obscure. Did participants mean they were upset by the actions of the attacker/s or the actions of rescue workers or other victims trying to escape? Unfortunately the “others” who were the target of the participants’ displeasure are important but unclear.

In another study, Tucker, Pfefferbaum, Nixon, and Dickson (2000) examined 85 adults seeking mental health assistance 6 months after the bombing. They found that the peritraumatic factor of physical injury to the person accounted for 24 % of the variance in post-traumatic stress. Two other factors impacted the presence of stress symptoms. Reports that counseling had been helpful accounted for 46% of the variance in traumatic

stress, and the feeling that work had been helpful accounted for 12% of the variance in stress reactions. The authors conceptualized these variables as social support variables. While this information is helpful, one must recognize that the sample used is not representative of all the people who experienced the Oklahoma City bombing, but rather represents those who were bothered enough by it to seek assistance.

Benight et al. (2000) also found that social support one year after the event was related to PTSD severity in the survivors of the Oklahoma City bombing. However, social support 2 months from the event was not related to PTSD severity. The authors offer no hypothesis for this finding, but call for additional research on the role of social support in civilian trauma victims. Benight et al. (2000) did demonstrate that coping self-efficacy, an individual's subjective appraisal of his or her coping ability, was predictive of PTSD severity. Despite the mixed findings of this study, the authors had an extremely small convenience sample (N=27), so these results have questionable reliability and must be interpreted with caution.

Nixon, Schorr, Boudreaux, and Vincent (1999) examined the sources of support and other factors that were most helpful to a sample of firefighters who were engaged in rescue and recovery in Oklahoma City. Surprisingly, the two most important variables were age and support from faith. Older firefighters reported more distress, although the authors believe that may reflect more willingness to report negative reactions among older, more experienced firefighters than their younger counterparts. The authors also found that those reporting the highest levels of faith support were also reporting more positive ratings of global attitude. Since attitude consists of perceptions, it is possible that the stronger faith base may lead to a more positive interpretation of the event (Nixon

et al., 1999). The most significant drawback of this study is that the authors created a survey to gather information rather than using already established measures. Because of this, the validity and reliability of the findings are questionable.

The impact of civilian trauma on American citizens is clearly vast. North et al. (1999) found significant psychiatric incidence in survivors of the Oklahoma City bombing, and reported that the victims felt as though the psychiatric symptomatology was impacting their lives in negative ways. Peritraumatic factors such as anxiety (Tucker et al., 1997) and physical injury (Tucker et al., 2000) were related to PTSD, and the post-traumatic factor of social support also were negatively related to trauma symptoms in that greater social support was related to fewer trauma sequelae (Benight, 2000; Tucker et al., 2000). Additionally, coping efficacy in victims predicted trauma symptoms (Benight, 2000) and support from faith in rescue workers was reported as one of the most important factors in facilitating adjustment (Nixon et al., 2000). However, there are significant drawbacks to the existing literature. For example, some of the studies are not empirically based so any information provided must be interpreted as commentary. Methodology for some studies is questionable in that established measures were not used or interviews were conducted without guarding against potential interviewer bias. Additionally, some of the literature reviewed had small, non randomized samples that may not have provided valid and reliable results. The literature on civilian trauma does provide important information, but there are substantial limitations for the current body of literature which creates a degree of question about the accuracy of the information provided.

Psychological factors

Resiliency. King et al. (1998) found that resiliency, which they defined as hardiness (Kobasa, 1979) (to be discussed later), was related to trauma reactions in veterans. However, little other research on trauma and resiliency has been conducted in the adult population. In fact, while the idea of resiliency seems like it should be important in trauma and resistance to stress, a clear operationalization of the concept has not been elucidated. While there is no definitive scientific understanding of resiliency and its components, research to this point seems to have reached a general consensus that resiliency refers to an ability to cope with adversity or protect against adversity (Edari & McManus, 1998; Schissel 1993).

Rutter (1987), more specifically defined resiliency as “the term used to describe the positive role of individual differences in people’s response to stress and adversity.” Rutter (1987) describes resiliency as various individuals’ ability to redirect their lives from risk or adversity to adaptation. He perceives the construct of resiliency as having two opposite poles: vulnerability and protection. This creates a sort of continuum on which various life or personality circumstances can shift a person from vulnerability for risk toward an ability to protect against risk.

Other factors have been identified as contributing to individual resiliency. Rutter (1987) asserts that resiliency is related to life circumstances and therefore, not a static trait. This implies that a person would respond differently to the same aversive experience depending upon other life situational factors (social support, environmental factors, health). While there is evidence that transient factors such as social support and environmental influences affect resiliency (Rutter, 1987), other researchers also suggest that more static or intrinsic factors also contribute to the construct of resiliency (Kobasa,

1979). Therefore, it is important to understand that there may be aspects of resiliency that change or can be attributed to a particular state or described as dynamic, but that there may also be aspects of resiliency that are static or described as a trait.

Rutter (1987) identified some factors such as social support, self-esteem and self-efficacy that can be influential in determining an individual's vulnerability or protective ability. Self-esteem and self-efficacy are general terms to describe how people view themselves, their environment, and their abilities. Both of these characteristics are protective mechanisms or contributors to resiliency (Rutter, 1987). Bandura (1986) defines self-efficacy as "people's judgments in their capabilities to organize and execute courses of action required to attain designated types of performance". Self-esteem refers to a person's ongoing sense of self-worth or a positive reflection of self. The development of these characteristics is largely related to secure and positive personal relationships and success in accomplishing important life tasks (Rutter, 1987). It would follow then that the development of such resiliency factors may dependent upon or influenced by the presence and quality of other factors such as social support and hardiness.

Other researchers and theorists have equated resiliency with the idea of hardiness (Edari & McManus, 1998; King et al., 1998; Kobasa, 1979). Kobasa (1979) first introduced the concept of hardiness when she explored personality factors that could mediate various psychological and physical illnesses resulting from stressful life events. She operationalized the construct of hardiness by identifying three characteristics of a hardy person. First, a hardy person feels a fairly high level of internal locus of control. Second, a hardy person finds meaningfulness and commitment in her life and

experiences. Finally, the hardy person perceives change as a challenge that can ultimately, positively further individual development.

Hardiness, therefore, represents a person's self-perception of control, commitment, and challenge that create a level of vitality or resiliency that permits this person's ability to manage stressful life experiences in a way that is developmental rather than debilitating (Kobasa, 1979; Maddi & Khoshaba, 1994; Bartone, Ursano, Wright, & Ingraham, 1989). An individual strong in control believes that with effort, he can exert an influence on his situation rather than being a passive victim (Maddi & Khoshaba, 1994). A person high in commitment is actively involved in making her life interesting, important and positive as opposed to feeling alienated and separate from life (Maddi & Khoshaba, 1994). The person with an elevated level of challenge finds positive value in growth that is obtained through lessons of life experiences (Maddi & Khoshaba, 1994). While these three characteristics of hardiness are distinct, they are interrelated and together they may contribute to resiliency to stressful life experiences.

Kobasa (1979) used this construct of hardiness to study executives who were exposed to high levels of stress. She attempted to delineate specific factors that were more characteristic of executives who tended to have fewer psychological and physical illnesses. She found that the hardy executive tended to be more committed to self as opposed to being alienated from self, be more vigorous toward his environment rather than vegetative toward his environment, find more meaningfulness in life instead of nihilism, and have a stronger internal locus of control than an external locus of control. She concluded that these factors were related to a more healthy method of coping with stress in this population.

Maddi and Khoshaba (1994) also studied hardiness, but they examined this construct with a more general sample and looked specifically at the correlations of hardiness with psychopathology. They found that the construct of hardiness is negatively related to most of the scales on the MMPI that indicate psychopathology. In other words, individuals who exhibit hardiness are less likely to have clinically diagnostic psychological distress. The findings of this study highlight that hardiness or the sense of control, commitment, and challenge may be indicative of positive mental health (Maddi & Khoshaba, 1994).

The current resiliency literature supports the idea that the presence of this construct is related to more positive mental health (Maddi & Khoshaba, 1994), healthy coping (Kobasa, 1979), and PTSD in veterans (King et al., 1998). However, with the exception of King et al., much of the research on resiliency has been conducted on general samples who have not experienced significant stress or trauma and therefore may not have any life event for which they needed to be resilient. Additionally, King et al.'s research only focuses on veterans and does not provide information on people who have recently experienced trauma or on civilians. Therefore, the current literature tells us very little about how this construct may affect reactions to a trauma or stressor in the civilian population. .

Religion/Spirituality. Additional factors related to resiliency are religion and spirituality. A review of spirituality and health by George, Larson, Koenig, and McCullough (2000) concluded that religion is related to reduced onset of physical and mental illnesses, reduced mortality and greater likelihood of recovery from both physical and mental illnesses (Elliot, Kilpatrick & McCullough, 1999; Harris et al., 1995; Idler,

1987; Pressman, 1990). George et al. (2000) also clarified the difference between the terms religion and spirituality. While some people consider religion to be more related to an institution and spirituality more subjective, George et al. (2000) highlight the similarities between the two terms, and conclude that most people use the terms synonymously. For the purpose of this study, we will do the same.

Harris et al. (1995) studied heart-transplant patients and found that patients who had strong religious beliefs and participated in religious practices reported better physical and mental health, had fewer health worries, and were more compliant with medical regimes than those who were less religious. Furthermore, research among the ill elderly has determined similar findings. Some research has shown that higher levels of religious beliefs and involvement among the elderly are related to lower levels of depressive symptomatology and lower levels of disability and mortality (Idler, 1987; Pressman, 1990).

In a study exploring optimism and coping in women with early stage breast cancer, Carver et al. (1993) found that use of religion was one of the most common coping reactions for these women. While the concepts of coping and resiliency are different, the use of religion as a method of coping indicates that religiosity may be related to resiliency. Although there is a paucity of research looking at the role of spirituality in trauma victims, as earlier noted, Nixon et al. (2000) did find that faith support was noted as one of the two most helpful factors in firefighters participating in rescue and recovery for the Oklahoma City Bombing. Furthermore, since previous research has shown that religion/spirituality is related to physical and mental well-being

in other populations, it is possible that those same findings could be generalizable to victims of civilian trauma.

Optimism. Optimism is the relatively stable characteristic that a person expects favorable outcomes or expects things “to go his/her way”. It is generally considered to be the opposite of pessimism, which is the expectation of negative or poor outcomes (Scheier & Carver, 1985). Research has shown that optimism is related to better coping and positive physical health. In one of the first studies on the role of optimism, Scheier and Carver (1985) examined 141 undergraduate students who took measures of optimism and physical symptoms at 2 points in time. The authors not only concluded that optimism was significantly related to the physical symptoms at each point, but also found that higher optimism scores at time 1 predicted fewer physical symptoms at time 2, indicating that optimism not only is related to physical health, but is also predictive of future health symptoms.

In a later study of 51 middle-aged men who underwent coronary bypass surgery, Scheier et al. (1989) found that dispositional optimism predicted faster rate of physical recovery, quicker return to activities of normal life and positive quality of life at 6 months post operation. Additionally, they found that dispositional optimism was positively related to problem focused coping and negatively related to avoidance coping or coping through denial (to be discussed in the next section). In the previously mentioned study by Carver et al. (1993), optimism was assessed in women with breast cancer at 1 day pre-surgery, 10 days post-surgery, and 3, 6, 12 months post surgery. At all 5 points in time, the women’s reported optimism was inversely related to their levels of distress. Like previous studies, those high in optimism tended to utilize coping strategies that were

active and approach oriented, whereas those with lower optimism scores engaged more in avoidance coping behaviors (Carver et al., 1993).

From a non-medical perspective, Brissette, Schreier, and Carver (2002) examined 89 college freshmen and assessed their levels of optimism, perceived social support, depression and stress level at the beginning and end of their first semester. Students with greater optimism reported more perceived social support at time 1 and increases in social support over the course of the semester. Higher optimism was also prospectively related to less depression and less reported stress at the end of the semester. The research clearly demonstrates that optimism is predictive of positive outcomes, specifically, of more positive perceived physical health, less reported distress, less depression, and greater levels of social support. While no studies were found specifically addressing the role of optimism in trauma, it is expected from the results of other studies involving extremely distressing situations, that optimism would also relate to lower levels of traumatic stress.

Much of what is known about optimism has been determined by studying college students. While this population can provide valuable information about optimism and various outcomes, it has limited generalizability to the general population. Some research has examined optimism with the stressful situation of a health problem, but in general there is a paucity of research examining this constructs relation to reactions to significant stressors such as a major trauma. Based on existing literature, one would expect optimism to be related to more positive outcomes after a traumatic event, but little current literature exists to elucidate the role of optimism and trauma.

Coping. Research has clearly demonstrated that coping style can impact adjustment and the effects of distressing events on adaptational outcomes in the general

population (Folkman & Lazarus, 1988) and in individuals specifically experiencing trauma (Solomon et al., 1988). Coping has been defined as an individual's consistent, dynamic cognitive and behavioral efforts to manage both internal and external demands that are appraised as exceeding the individual's personal resources (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986; Folkman & Lazarus, 1988; Lazarus & Folkman, 1984) It is important to note that this definition does not include an evaluative component regarding the success of the coping efforts. Rather it simply focuses on management efforts instead of mastery.

Another important aspect of this definition is that it is process-oriented. The process-oriented approach is interested in examining what a person actually thinks or does within the context of a specific situation. The non process-oriented approach to coping is the trait or dispositional approach, which sees coping as a static characteristic of an individual. This approach tries to identify what a person most often does or is most likely to do. The process approach has been more widely accepted in recent years because it allows researchers to examine coping efforts that have already occurred and puts the coping behaviors in their appropriate situational context. The situational context of the coping behavior is important because individuals may display different coping behaviors in different environments, which indicates that coping is not a static trait, but rather a dynamic process. (Folkman et al., 1986; Folkman & Lazarus, 1988; Lazarus, 1993).

Using the process-oriented approach to coping, Folkman and Lazarus have proposed a theory of stress and coping, which consists of two parts (Folkman et al., 1986; Folkman & Lazarus, 1988; Lazarus & Folkman, 1984). The first is the individual's

cognitive appraisal of how a given encounter with the environment is relevant to the individual's well-being. The second is the actual coping thoughts or behaviors executed by the individual. The appraisal phase of the coping theory really consists of two parts. The primary appraisal is the person's evaluation of the situation and any risks that may be present to his or her well-being. The secondary appraisal is the person's evaluation of what, if anything, he or she can do to prevent or overcome harm or adversity, or improve the prospects of personal benefit (Folkman et al., 1986; Folkman & Lazarus, 1988; Lazarus & Folkman, 1984). The secondary appraisal is also an assessment of how controllable the event is deemed to be. The appraised controllability of the event is strongly related to the functional coping strategy selected and the effectiveness of that strategy (Conway & Terry, 1992; Folkman, Schaefer, & Lazarus, 1979). It is important to note that actual controllability of the event is not as important as the individual's appraisal of the controllability.

Two main functions of coping have been identified. One includes the regulation or management of stressful emotions and includes coping strategies labeled as emotion-focused coping. The second involves actually altering the person-environment interaction that is creating distress for the individual. Strategies that address this goal are problem-focused coping. Folkman & Lazarus (1980) used these different coping functions and controllability to examine the situational factors that affect coping (Folkman & Lazarus, 1988). They found that when events are appraised as controllable, problem-focused coping tended to be more adaptive. However, when a situation was appraised as not controllable, emotion-focused coping was more adaptive. These findings support the assumption that the appraised controllability of an event should be

congruent with coping efforts. In summary, if an event is appraised as controllable, then attempts to manage the situation will facilitate adaptation, whereas, if the situation is appraised as not controllable, then attempts to manage emotions will be more associated with adaptivity.

Subsequent research has supported this conceptualization of appraised controllability and functional coping (Conway & Terry, 1992; Folkman & Lazarus, 1980; Folkman et al., 1986; Ingledew, Hardy, & Cooper, 1997; Lazarus, 1993; Valentiner, Holahan, & Moos, 1994). Strenz and Auerbach (1988) examined coping in a high-threat, short term, low control situation. The authors utilized a sample of 57 flight attendants and pilots who were about to take part in a simulated abduction and 4 day captivity. The participants were instructed in either problem or emotion focused coping. Levels of anxiety were measured throughout the exercise to insure that the simulation was a significant stressor. The results demonstrated that those who were taught emotion-focused coping techniques tended to report the lowest levels of anxiety and emotional distress, where as, participants utilizing the problem focused techniques had the most negative reports on all measures. Clearly, in this low control situation, emotion-focused coping was most useful.

While one type of coping may be used more than the other depending upon appraisal of event controllability, it is important to note that the most adaptive coping responses will likely utilize both emotion and problem-focused coping to some degree (Solomon et al, 1988). Some researchers have even suggested that it is difficult to partial out problem-solving and emotion-focused coping because they likely impact one another (Carver & Scheier, 1994). For example, emotion-focused coping efforts may alleviate

some emotional distress, facilitating problem-solving efforts. Likewise, as problems are successfully handled, emotional distress will likely diminish.

Specific coping factors have been delineated by examining one of the most widely used coping measures, the Ways of Coping Questionnaire (Lazarus & Folkman, 1984; Long, 1990). Analyses of this measure have revealed a variety of factors (Aldwin & Revenson, 1987; Folkman & Lazarus, 1985). However, Long (1990) identified and discussed three of the most frequently found factors: problem solving, avoidance coping, and problem reappraisal. This three factor conceptualization of coping suggests that the emotion-focused component of coping should be divided into two subsequent factors: avoidance and problem reappraisal coping. From this perspective, problem solving still refers to the active efforts to address the problem. Problem reappraisal includes efforts to alter or manage the appraised stressfulness of an event, and avoidance coping refers to emotional management that attempts to reduce tension by avoiding the problem, such as use of fantasy or denial (Long, 1990). Both problem solving and problem reappraisal are considered approach coping, while avoidance coping is considered the opposite of approach coping.

Generally, research has shown that approach coping has been associated with more positive psychological outcomes and avoidance coping is related to poorer outcomes (Aspinwall & Taylor, 1992; Holahan & Moos, 1986; Ingledew, Hardy, & Cooper 1997; Valentiner, Holahan, & Moos, 1994). Holahan and Moos (1986) found that people who were less inclined to use avoidance coping were more protected from negative psychological consequences of distressing events. Vitaliano et al. (1985) examined a group of distressed individuals and reported that wishful thinking was

positively related to depression and problem focused coping was negatively related to depression. In a later study, Vitaliano et al. (1987) found that panic disordered patients tended to use less problem focused coping and more wishful thinking. Additionally, problem focused coping was negatively related to depression and anxiety in this group. Although most research connects avoidance coping with negative outcomes, Suls and Fletcher (1985) used a meta-analysis of 43 studies to compare avoidant and non-avoidant coping. They concluded that avoidant coping might actually be beneficial in the short term and non-avoidant coping more beneficial in the long term.

Social support and coping have been closely linked by many researchers (Lazarus & Folkman, 1984; Thoits, 1986; Valentiner, Holahan, & Moos, 1994). Both social support and coping impact positive adjustment, but some have suggested that social support can bolster adaptive coping and that adaptive coping can contribute to increased social support (Ingledeu, Hardy, & Cooper, 1997; Valentiner, Holahan, & Moos, 1994). Valentiner, Holahan, and Moos proposed a mediational model in which social support would affect positive adjustment both directly and indirectly via adaptive coping strategies. In this model, they also hypothesized that appraised controllability of the event would be a moderating variable. Their hypotheses were upheld, and they found that social support did have both direct and indirect effects on positive adjustment, with coping as the mediating variable for the indirect effects. Additionally, when events were perceived as uncontrollable, social support related directly to positive adjustment, whereas, when the events were controllable, social support predicted adaptive coping, and adaptive coping then predicted changes in adjustment.

Obviously, coping is a very complex variable. To summarize, for this study, coping will be viewed as a process-oriented variable in which coping should be measured in relation to a specific context. Additionally, research has demonstrated that appraised controllability of event often acts as a moderating variable in the decision of an individual to use either problem-focused or emotion-focused coping strategies. Many researchers agree that avoidance coping is more deleterious and approach coping is more adaptive, although it has been suggested that avoidance coping may be more adaptive in the short term. Finally, coping and social support are closely related, and it has been suggested that that coping may mediate social support's effects on adjustment.

Social factors

Social support. Social support has been demonstrated as a factor that is related to decreased incidence of PTSD and other psychological symptomatology in trauma victims (Benight et al, 2000; Brewin et al, 2000; Gidron, 2002; King et al., 1998; Nixon et al., 1999; Ofman et al., 1995; Solomon et al., 1988; Tucker et al., 1997) and has been noted as a contributor to resiliency (Rutter, 1987). Social support has consistently been shown to contribute to positive adjustment and personal development in general (Sarason, Levine, Basham, & Sarason, 1983). Additionally, those who report good social support also seem to be less vulnerable to psychological disorders (Cobb, 1976; Gottlieb, 1978; Holahan & Moos, 1981; Leavy, 1983). From a physiological perspective, researchers have also demonstrated that those without social support during a stressful event may actually be more vulnerable to illness (Cobb, 1976; Hobfoll & Walfish, 1984; Uchino, Cacioppo, & Kiecolt-Glaser, 1996).

Sarason et al. (1983) defined social support as having people on whom an individual can rely and who care about and value the individual. In social support research, an ongoing debate has attempted to delineate whether the perception of social support or the actual support received is more important (Sarason, Shearin, Pierce, & Sarason, 1987). Received support specifically refers to people's helping behaviors provided to an individual, whereas, perceived support is the belief that those people and helping behaviors will be there in times of need (Norris & Kaniasty, 1996; Sarason, Sarason, Shearin, & Pierce, 1987). Most research findings now seem to indicate that the perception or belief that social support is present more clearly predicts psychological health and serves as a protection during stressful times (Norris & Kaniasty, 1996). Norris and Kaniasty (1996) found that perceived support was a mediator of long-term effects on distress in individuals exposed to natural disasters.

The mechanisms through which social support affects psychological and physical health have been greatly explored. Some suggest that social support's helping mechanism may occur because social support could have an impact on subjective appraisal of a situation or an event or it could affect choice of coping style and it may increase and individual's feelings of self-esteem, mastery and control which could impact psychological and physical health (Lepore, Evans, & Schneider, 1991).

The most well know model of how social support works is Cohen and Wills (1985) stress buffering hypothesis. The stress buffering hypothesis suggests that social support may serve as a mitigator in the emotional impact of stressful life events (Cohen and Wills, 1985). In the seminal article regarding this topic, Cohen and Wills (1985) examine two models of how social support may work in stressful situations. Specifically,

they tried to delineate whether the buffering hypothesis, which addresses the protective effects of social support primarily during times of stress, or the main-effect model, which included the idea that social support has a positive impact irregardless of level of stress, best fit the role of social support in individual lives. They actually concluded that sufficient evidence existed to support both the buffering model and the main-effect model. However, much subsequent research has focused on the protective, buffering effect that social support has on individuals during stressful events (Cutrona & Russell, 1987).

Support for the physiological effects of social support has been wide spread. In a review of 81 articles, Uchino, Cacioppo, and Kiecolt-Glaser (1996) report that social support was significantly related to positive effects on health in patients' cardiovascular, endocrine, and immune systems. In literature on breast cancer Green (1993) reported that the recovery environment of a breast cancer patient such as availability and use of positive social support could aid in the adaptation to the stressful event, or illness. On the other hand, the absence of social support could actually interfere with adaptation and increase difficulties in psychological functioning which represents the opposite of the buffering hypothesis (Butler et al., 1999; Cohen & Wills, 1985). Interestingly, Wohlgemuth and Betz (1991) found that gender may serve as a moderator in the beneficial effects of social support on health. In a study on the relationship of stress and social support to health in college students, they found that stress, social support and the interaction of the two accounted for 18-29% of the variance of physical symptomatology in females but not in men. Further exploration of the role of gender as a moderator of social support is needed. Social support has been clearly demonstrated to have a

significant role in buffering against stressful events and is positively related to both psychological and physical health. Social support has been related to positive adjustment in the general population, in the physically ill, and in trauma survivors.

Institutional support. Institutional support is another social factor that can bolster adjustment during stressful events (Hoffman, 1996). However, it is generally less stable than traditional social support because it is often role specific. For example, after September 11, many New Yorkers utilized the Red Cross, which would qualify as a source of institutional support. However, nine months later, the utilization of that community source has likely subsided. There are three main areas of institutional support (Hoffman, 1996). First, employment serves many functions for individuals including a sense of identity, a sense of income, a source of interpersonal connection, and supportive benefits such as health insurance. Second, Religious and Spiritual institutions serve as a source of support. These institutions can also provide a source of interpersonal connection. However, they also often serve as a source of guidance and meaning and can bolster intrapersonal support such as sense of inner strength and peace. Finally, the last institutional support sources include medical, psychological and community sources. These can involve support groups, hotlines, legal assistance, and organizations such as the Red Cross.

Adjustment

Subjective Well-being. Much research has focused on outcomes measures that indicated levels of pathology. However, a more recent movement has been to use indicators of well-being as measures of outcome. Subjective well-being (SWB) has become a gold standard of approaches to understanding wellness. Many definitions of

SWB exist, though most are highly related. Veenhoven (1984) describes SWB as the degree to which a person perceives their overall quality of life in a favorable way.

Andrews and Withey (1976) view SWB as containing both affective and cognitive components. Campbell, Converse, and Rodgers (1976) describe the cognitive aspect of satisfaction as a discrepancy between goals and achievements.

A more recent author who has studied SWB, Diener (1984) sees SWB as a way to think about how and why people have experienced their lives in positive ways. Like Andrews and Withey (1976), Diener (1984) also sees SWB as including both a cognitive and affective way of experiencing positivity. He (1984, 1994) has described his conceptualization of SWB as consisting of an overall understanding of life satisfaction combined with the presence of positive affect and the absence of negative affect.

Diener (1984, 1994) describes three main hallmarks of subjective well-being. First, an individual's assessment of SWB is, as the name suggests, subjective. In other words, the individual's appraisal of well-being is internal and can only be determined by that individual. Second, SWB is not simply the absence of negative factors; it must include the presence of positive factors as well. Third and finally, SWB is meant to be a global assessment of overall satisfaction. While affect related to or satisfaction within specific domains is important and informative, SWB attempts to assess an integrated judgment of all domains of a person's life.

Research on the components of SWB has revealed several correlates. People who are classified as wealthy report slightly higher levels of SWB, while those who are unemployed seem to be the least happy (Campbell et al., 1976; Diener, 1984, 1994). Education is correlated with SWB at .13, and seems to be most important in individuals

who are below the poverty line (Robbins & Kliewer, 2000). Interestingly, Robbins and Kliewer (2000) report little to no effect of gender and age on SWB despite findings that depression is prevalent in older adults and women are often more prone to psychiatric illness. Personality factors also seem to be linked to SWB. Self-esteem (Diener & Diener, 1993 as cited in Diener, 1994) and maturity (Alker & Gawin, 1978) were both related with higher SWB. Extraversion, usually associated with energy and enthusiasm, and neuroticism, often associated with negative mood and negative self-concept, have frequently been cited as predictors of SWB. In terms of coping, people who appraise events as less threatening perceive more resources to deal with stress, and utilize active or approach coping also tend to report higher levels of SWB, as well as better physical health, and fewer psychological problems. Additionally, SWB has been shown to be moderately correlated with optimism, work satisfaction, adjustment, family satisfaction, self-reported health status, and religion (Diener, Suh, Lucas, & Smith, 1999; Okun & Stock, 1987; Robbins & Kliewer, 2000).

Because traumatic events can have lasting effects on individuals in psychological, social, and biomedical ways, it is possible that the experience of a traumatic event could also affect an individual's subjective appraisal of well-being. While SWB has not been extensively used in trauma research in the past, Diener's conceptualization of SWB may be useful with trauma victims for several reasons. For one, it is subjective and encompasses a cognitive and affective component, so that an individual's experience (both cognitive and affective) is conveyed as he or she perceives it. This is important because everyone reacts to similar circumstances differently based on their previous experiences, expectations and values (Diener et al., 1999). Also, this SWB

conceptualization reflects an overall appraisal of life satisfaction, which is important to examine in addition to domain specific satisfaction (e.g., work) since, as the biopsychosocial model suggests, several aspects of life are likely impacted by trauma.

Job satisfaction. Job satisfaction is relevant in this study for two reasons. First, the sample was present in the World Trade Center for a work related conference. Therefore, they experienced the trauma with professional colleagues in addition to whatever family may have been traveling with them. However, they then returned to a work environment where most people had not shared in the traumatic event. It is possible that the connection of this event to their professional life will affect how they feel about their job and their overall work satisfaction.

Second, current research shows that job satisfaction is related to biopsychosocial characteristics. For example, Judge, Locke, Durham, and Kluger (1998) show that job satisfaction is related to a person's affect. Additionally, social support has been shown to contribute to work adjustment and job satisfaction and to less burnout (Long, Kahn, & Schutz, 1992). Because it has already been shown that trauma has a biopsychosocial impact and that job satisfaction is related to biopsychosocial factors, it is likely that changes in job satisfaction may also be related to the experience of a traumatic event, particularly one related to work.

Summary

Previous research has clearly demonstrated that trauma has a biopsychosocial effect on victims and that various psychological, biosocial, and social factors can affect adjustment in trauma victims (e.g., Breslau, 2001; Brewin, Andrews, & Valentine, 2000; Cobb, 1976; Uba & Chung, 2002). Trauma survivors consistently show increased current

and chronic health problems and somatization (e.g., Breslau, 2001), and they can also experience depression, anxiety, and Post-Traumatic Stress Disorder (PTSD) as psychological reactions to trauma (Astin, Lawrence, & Foy, 1993; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). However, psychological characteristics (e.g., resilience and optimism) can have an ameliorating effect on the experience of, and ongoing reactions to, trauma (e.g., King et al., 1998). There is also clear evidence that social factors such as social support buffer individual's reactions to PTSD and may reduce symptomatology (King et al., 1998).

However, what can actually be delineated from the existing literature and applied to victims of civilian trauma is questionable. Much of the extant trauma literature has been conducted on military personnel or veterans and is not generalizable. Additionally, the literature that has examined terrorism or civilian trauma has had significant problems methodologically or has simply not been empirically researched. Furthermore, the role of significant factors such as resiliency and optimism has not been adequately explored in the area of trauma, particularly in terms of civilian trauma. In general, little is known about how people react to or adjust to an intentional, large-scale civilian trauma. In order to expand the current understanding of trauma and improve upon current literature, it is helpful to investigate events such as September 11th in order to elucidate trauma reactions in to this type of disaster as well as gain a better understanding of the role of various biopsychosocial variables that may effect overall adjustment. .

To summarize, the current study sought to examine reactions to the September 11 terrorist attacks and identify biopsychosocial factors that could effect those reactions. Subjective well-being, impact of traumatic event, and job satisfaction served as the means

of assessing reactions to 9/11/01. The biopsychosocial model provided the framework for understanding potential factors (e.g., health perceptions, resiliency, social support, gender, etc...) that could relate to various trauma reactions. It was predicted that those with better health perceptions, more positive psychological characteristics, and more social support would report better overall adjustment to the traumatic events experienced on September 11, 2001. It was hoped that the results could add to the literature on trauma in general and to the limited but growing body of research on large-scale civilian trauma.

Chapter 3

Statement of Problem

In order to address the paucity of research on major civilian traumatic events, this study provided an examination of predictors of adjustment as indicated by higher levels of subjective well-being, greater job satisfaction, and less reported intrusion of the traumatic event. This sample represents an important group to study because much of what we know about traumatic reactions is in individuals involved in combat or other military action or is related to interpersonal violence or natural or accidental disasters. Very little research has been conducted examining the reactions of people who are civilian victims of an intentionally malicious, large-scale traumatic event such as the terrorist attacks on the World Trade Center Towers on September 11, 2001.

Preliminary reports regarding reactions to the events of September 11 indicate that there are biosocial (e.g., gender), psychological (e.g., PTSD and depression) and social (e.g., social support) components to how people have responded to these events (Galea et al., 2002; Schuster et al., 2001). While there are no data at present that reflect physiological consequences, it is likely that the distress created by 9/11 has or will result in changes in health (either perceived or actual) as well as the possibility of psychosomatic symptoms often associated with anxiety such as shortness of breath, numbness, and chest pains. Researchers have also reported increased use of substances such as alcohol and drugs in NYC residents which could also lead to future health problems in people in NYC (Vlahov et al., 2002). Therefore, it is imperative that investigation of this event occur within a framework that encompasses the multi-level effect that trauma can have on survivors. For this reason, the biopsychosocial model was

used to conceptualize adjustment predictors in terms of biomedical, biosocial, psychological, and social factors.

Hypothesis and Research Questions

The primary hypotheses for the biopsychosocial approach to this study included an examination of: (a) the relation of biomedical variables to adjustment variables, (b) the relation of psychological variables to adjustment variables, (c) the relation of social variables to adjustment, and (d) the relation of biosocial variables to adjustment.

Biomedical factors and adjustment

Hypothesis 1: Perceived physical health status as indicated by perceptions of general health will be positively related to indicators of adjustment, such that perceptions of good physical health will be related to higher levels of adjustment two weeks before, two weeks after, and 1 year after 9/11.

Individuals who experience trauma often have lasting effects, which impact both psychological and physical health (King, King, Fairbank, Keane, & Adams, 1998). Psychological impacts will be discussed in the following section. Physiologically, it has been consistently demonstrated that the experiencing of traumatic events is often related to increased health problems (Breslau, 2001; Clum, Nishith, Resick, 2001; Martin, Rosen, Durand, Knudson, & Stretch, 2002; Stein & Barrett-Connor, 2000; Uba & Chung, 2002).

Hypothesis 1a: Perceived physical health status as indicated by perceptions of general health, with higher scores indicating greater physical health perceptions, will be positively related to subjective well-being two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 1b: Perceived physical health status as indicated by perceptions of general health, with higher scores indicating greater physical health perceptions, will be positively related to job satisfaction two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 1c: Perceived physical health status as indicated by perceptions of general health, with higher scores indicating greater physical health perceptions, will be negatively related to reported impact of traumatic event two weeks after and 1 year after 9/11.

Hypothesis 2: The reported presence of somatic symptoms of distress will be negatively related to adjustment variables, such that greater presence of somatic symptoms will relate to poorer adjustment two weeks before, two weeks after, and 1 year after 9/11.

It is important to note that somatization is a significant problem for individuals who have experienced trauma and have PTSD. For example, Breslau (2001) reported a positive relation between somatization symptoms and PTSD. In a previous study, she and her colleagues (Adreski, Chilcoat, & Breslau, 1998) found that people with PTSD reported three times as many symptoms associated with somatization than individuals without PTSD.

Hypothesis 2a: The reported presence of somatic symptoms of distress will be negatively related to subjective well-being two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 2b: The reported presence of somatic symptoms of distress will be negatively related to job satisfaction two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 2c: The reported presence of somatic symptoms of distress will be positively related to impact of event two weeks after and 1 year after 9/11.

Psychological factors and adjustment

Hypothesis 3: Mental health will be positively related to overall adjustment, such that better mental health relates to better adjustment two weeks before, two weeks after, and 1 year after 9/11. Mental health will be defined by levels of depression and anxiety, with better mental health reflected by less depression and anxiety.

The psychological impact of trauma exposure can be profound in that many trauma victims will develop traumatic stress reactions (which can lead to PTSD) and often experience other psychological comorbidity (Breslau, 2001). Studies of the Three Mile Island disaster also revealed that area residents had elevated scores on various measures of depression, anxiety, and physical complaints when compared to a control group (Baum, Gatchel, & Schaeffer, 1983; Davidson & Baum, 1986). Some psychological sequela reported by victims of interpersonal violence, a more personal form of trauma, include depression, suicide attempts, somatic complaints, and nightmares (Astin, Lawrence, & Foy, 1993; Astin et al., 1995; Browne, 1993); anxiety and memory loss (Astin et al., 1993; Astin et al., 1995); social withdrawal, intense startle responses, and affective numbing (Astin et al., 1995; Browne, 1993); and re-experiencing the trauma (Astin et al., 1993; Astin et al., 1995; Valentiner et al., 1996).

Hypothesis 3a: Mental health, as defined by levels of depression and anxiety, with higher levels of mental health reflected by less depression and anxiety, will be positively related to subjective well-being two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 3b: Mental health, as defined by levels of depression and anxiety, with higher levels of mental health reflected by less depression and anxiety, will be positively related to job satisfaction two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 3c: Mental health, as defined by levels of depression and anxiety, with higher levels of mental health reflected by less depression and anxiety, will be negatively related to impact of event two weeks after and 1 year after 9/11.

Hypothesis 4: Higher reported resiliency will be positively related to adjustment such that those with higher reported levels of resiliency will also report better adjustment two weeks before, two weeks after, and 1 year after 9/11.

In one study, King, King, Fairbank, Keane, and Adams (1998) examined resiliency, social support, other stressful life events and PTSD in male and female Vietnam veterans. King et al. (1998) found that resiliency was related to trauma reactions in veterans.

Hypothesis 4a: Higher reported resiliency will be positively related to subjective well-being two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 4b: Higher reported resiliency will be positively related to job satisfaction two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 4c: Higher reported resiliency will be negatively related to impact of event two weeks after and 1 year after 9/11.

Hypothesis 5: Higher levels of optimism will be positively related to overall adjustment, such that more optimism will be related to better adjustment two weeks before, two weeks after, and 1 year after 9/11.

Research has shown that optimism is related to better coping and positive physical health. In one of the first studies on the role of optimism, Scheier and Carver (1985) examined 141 undergraduate students who took measures of optimism and physical symptoms at 2 points in time. The authors not only concluded that optimism was significantly related to the physical symptoms at each point, but also found that higher optimism scores at time 1 predicted fewer physical symptoms at time 2, indicating that optimism not only is related to physical health, but is also predictive of future health symptoms.

Hypothesis 5a: Higher levels of optimism will be positively related to subjective well-being two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 5b: Higher levels of optimism will be positively related to job satisfaction two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 5c: Higher levels of optimism will be negatively related to intrusion of event two weeks after and 1 year after 9/11.

Hypothesis 6: Higher levels of avoidance coping will be negatively related to adjustment, so that higher use of avoidance coping will relate to worse adjustment outcomes two weeks after and 1 year after 9/11.

Research has shown that approach coping has been associated with more positive psychological outcomes and avoidance coping is related to poorer outcomes (Aspinwall & Taylor, 1992; Holahan & Moos, 1986; Ingledeu, Hardy, & Cooper 1997; Valentiner,

Holahan, & Moos, 1994). Holahan and Moos (1986) found that people who were less inclined to use avoidance coping were more protected from negative psychological consequences of distressing events. Vitaliano et al. (1985) examined a group of distressed individuals and reported that wishful thinking was positively related to depression and problem focused coping was negatively related to depression.

Hypothesis 6a: Higher levels of avoidance coping will be negatively related to subjective well-being, so that higher use of avoidance coping will relate to worse subjective well-being outcomes two weeks after and 1 year after 9/11.

Hypothesis 6b: Higher levels of avoidance coping will be negatively related to job satisfaction, so that higher use of avoidance coping will relate to worse job satisfaction two weeks after and 1 year after 9/11.

Hypothesis 6c: Higher levels of avoidance coping will be positively related to intrusion of event, so that higher use of avoidance coping will relate to higher intrusion of event two weeks after and 1 year after 9/11.

Hypothesis 7: When perceived controllability is high, more problem-focused coping strategies will be positively related to adjustment, with poor adjustment predicted by less problem-focused coping.

Folkman & Lazarus (1980, 1988) used these different coping functions and controllability to examine the situational factors that affect coping. They found that when events are appraised as controllable, problem-focused coping tended to be more adaptive. However, when a situation was appraised as not controllable, emotion-focused coping was more adaptive. These findings support the assumption that the appraised controllability of an event should be congruent with coping efforts. In summary, if an

event is appraised as controllable, then attempts to manage the situation will facilitate adaptation, whereas, if the situation is appraised as not controllable, then attempts to manage emotions will be more associated with adaptivity. Subsequent research has supported this conceptualization of appraised controllability and functional coping (Conway & Terry, 1992; Folkman & Lazarus, 1980; Folkman et al., 1986; Ingledew, Hardy, & Cooper, 1997; Lazarus, 1993; Valentiner, Holahan, & Moos, 1994).

Hypothesis 7a: When perceived controllability is high, more problem-focused coping strategies will be positively related to subjective well-being, with less subjective well-being predicted by less problem-focused coping.

Hypothesis 7b: When perceived controllability is high, more problem-focused coping strategies will be positively related to job satisfaction, with less job satisfaction predicted by less problem-focused coping.

Hypothesis 7c: When perceived controllability is high, more problem-focused coping strategies will be negatively related to intrusion of event, with higher intrusion of event predicted by less problem-focused coping.

Hypothesis 8: When perceived controllability is low, more emotion-focused coping strategies will be positively associated with adjustment, such that less emotion-focused coping will predict poorer adjustment.

Hypothesis 8a: When perceived controllability is low, more emotion-focused coping strategies will be positively associated with subjective well-being, such that less emotion-focused coping will predict less subjective well-being.

Hypothesis 8b: When perceived controllability is low, more emotion-focused coping strategies will be positively associated with job satisfaction, such that less emotion-focused coping will predict poorer job satisfaction.

Hypothesis 8c: When perceived controllability is low, more emotion-focused coping strategies will be negatively associated with intrusion of event, such that less emotion-focused coping will predict higher intrusion of event.

Social variables and adjustment

Hypothesis 9: Higher reported levels of social support will be positively related to adjustment, such that more reported social support would be related to better adjustment two weeks before, two weeks after, and 1 year after 9/11 two weeks before, two weeks after, and 1 year after 9/11.

Social support has been demonstrated as a factor that is related to decreased incidence of PTSD and other psychological symptomatology in trauma victims (Benight et al, 2000; Brewin et al, 2000; Gidron, 2002; King et al., 1998; Nixon et al., 1999; Ofman et al., 1995; Solomon et al., 1988; Tucker et al., 1997) and has been noted as a contributor to resiliency (Rutter, 1987). Social support has consistently been shown to contribute to positive adjustment and personal development in general (Sarason, Levine, Basham, & Sarason, 1983). Additionally, those who report good social support also seem to be less vulnerable to psychological disorders (Cobb, 1976; Gottlieb, 1978; Holahan & Moos, 1981; Leavy, 1983).

Hypothesis 9a: Higher reported levels of social support will be positively related to subjective well-being two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 9b: Higher reported levels of social support will be positively related to job satisfaction two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 9c: Higher reported levels of social support will be negatively related to intrusion of event two weeks after and 1 year after 9/11.

Hypothesis 10: Utilization of institutional support will be positively associated with overall adjustment, so that more reported use of institutional support would relate to better adjustment two weeks before, two weeks after, and 1 year after 9/11.

Institutional support is another social factor that can bolster adjustment during stressful events (Hoffman, 1996) two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 10a: Utilization of institutional support will be positively associated with subjective well-being two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 10b: Utilization of institutional support will be positively associated with job satisfaction two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 10c: Utilization of institutional support will be negatively associated with intrusion of event two weeks after and 1 year after 9/11.

Biosocial factors and adjustment

Hypothesis 11: Gender will be significantly related to adjustment such that women will have significantly higher scores on intrusion of event than men. Biosocial factors such as gender also play a role in the experiencing of symptoms of Acute Stress Disorder or PTSD. Findings consistently demonstrate that women are at a greater risk of experiencing traumatic sequela, both physical and psychological, than men (Breslau, 2001; De Marco, 2000; Foa & Street, 2001; Martin et al., 2002; Purves & Erwin, 2002;

Zlotnick, Zimmerman, Wolfsdorf, & Mattia, 2001). Although causal explanations are not available, some suggest that this may be due to differences between the genders in reporting general effects of trauma or the manner in which distress is exhibited. Furthermore, women may be more likely to discuss their concerns with others as well as utilize social support. Recent research has shown that recalling traumatic memories in a manner that increases stress hormones consolidates the traumatic memory (Henig, 2004), which can hinder working through the memory.

Biopsychosocial model

The following hypothesis tested the study's theoretical structure of the biopsychosocial model by exploring the predictive ability of biomedical factors (i.e., general health perceptions), psychological variables (i.e., depression, resiliency, optimism, and coping), social factors (i.e., social support and institutional support), and biosocial variables (i.e., gender) on outcome variables measuring adjustment. For regression analyses, all R squares are adjusted R squares in order to account for shrinkage due to sample size. Additionally, beta weights were calculated to determine whether the predictor variables accounted for unique variance in the criterion variables.

Hypothesis 12: Biomedical factors will account for significant variance in overall adjustment two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 12a: Biomedical factors will account for significant variance in subjective well-being two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 12b: Biomedical factors will account for significant variance in job satisfaction two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 12c: Biomedical factors will account for significant variance in intrusion of event two weeks after, and 1 year after 9/11.

Hypothesis 13: Psychological factors will significantly contribute to the variance in overall adjustment two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 13a: Psychological factors will significantly contribute to the variance in subjective well-being two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 13b: Psychological factors will significantly contribute to the variance in job satisfaction two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 13c: Psychological factors will significantly contribute to the variance in intrusion of event two weeks after and 1 year after 9/11.

Hypothesis 14: Social factors will explain a significant amount of variance in overall adjustment two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 14a: Social factors will explain a significant amount of variance in subjective well-being two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 14b: Social factors will explain a significant amount of variance in job satisfaction two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 14c: Social factors will explain a significant amount of variance in intrusion of event two weeks after and 1 year after 9/11.

Hypothesis 15: Biosocial factors will explain a significant amount of variance in overall adjustment two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 15a: Biosocial factors will explain a significant amount of variance in subjective well-being two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 15b: Biosocial factors will explain a significant amount of variance in job satisfaction two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 15c: Biosocial factors will explain a significant amount of variance in intrusion of event two weeks after and 1 year after 9/11.

Additional Questions

In addition to the above-mentioned hypotheses, several questions were explored in the present study.

1. What is the relationship between race/ethnicity and subjective well-being, job satisfaction, and intrusion of event?
2. What is the relationship between gender and subjective well-being and job satisfaction?
3. Is there a gender difference in the types of coping (i.e., problem focused vs. emotion focused) selected when appraised controllability is controlled?

Chapter 4

Method

Design

This study used a descriptive, non-experimental, correlational design to examine the relationship between biopsychosocial factors and the subjective well-being, impact of event, and job satisfaction of survivors of a traumatic event. All indicators were assessed using self-report measures. Participants were asked to report both current and retrospective data about their reactions before and two weeks after 9/11/01. Retrospective self-report data collection has been proven to be equal to or superior to prospective self-report data collection on a number of psychological dimensions (Howard, 1993) and was, therefore, selected as a reliable and accurate method of measuring reactions and functioning both 2 weeks before and 2 weeks after September 11. Data was collected at approximately one year after 9/11, so participant's reporting of current functioning is reflective of their functioning one year after the terrorist attacks.

Participants

This study utilized a non-random sample of individuals who experienced the World Trade Center attacks. Participants were limited to members of the National Association for Business Economics (NABE) or affiliates of NABE including family and press who were attending a three-day annual meeting, which was taking place at the Marriott World Trade Center. There were approximately 250-300 members or affiliates present. This sample consisted of 96 participants with a mean age of 48.7. Ninety-two percent of the sample was European-American, and 20 participants were female, 71 were male and 5 did not report gender. Members and affiliates of this group were at a breakfast

meeting in the grand ballroom on the ground level of the hotel on September 11, 2001 when the first plane struck the North Tower. The Marriott straddled the twin towers (its lobby adjoined the lobby of the North Tower) and was destroyed. The sample was expected to represent a heterogeneous group of men and women in regard to ethnicity, age, and geographic residency. However, the sample was more homogenous in terms of gender, ethnicity, age, educational background and socio-economic status.

Measures

Demographic Questionnaire. (See Appendix A). A demographic questionnaire was developed for the purpose of this study. This questionnaire will ask participants to provide the following information about themselves: a) age b) gender c) race or ethnicity d) highest educational level and degree earned. Additional information was also collected (in line with the other WTC study) to be consistent with an additional study on 9/11/01 and to allow for comparisons with that study. Some of that information was not for the purpose of the present study. Participants were also given the opportunity to share positive outcomes of their experience on 9/11. Finally, participants were invited to share any comments they might have.

Biomedical Measures

General Health Perceptions Subscale (GHP-5; Ware & Sherbourne, 1992; see Appendix B) measures individuals' perceptions of physical health. The GHP-5 is a subscale of the more broad MOS 36-SF, which was created for use in both clinical practice, research and with the general population. The SF-36 is constructed of items adapted from other well-established health instruments. Ware and Sherbourne (1992) created this measure as a more efficient test for assessing general health concepts based

on the accumulation of data collected from the 18-item and 20-item Medical Outcome Study short-forms. The GHP-5 Subscale specifically measures general health perceptions, which includes health outlook, perception of resistance to illness, and current health. Respondents answer the first question of the GHP-5 Subscale on a scale from 1 (poor) to 5 (excellent). On the remaining four questions, respondents rate the statements on a scale from definitely true (1) to definitely false (5). Example items include, "I seem to get sick a little easier than other people" and "My health is excellent." Lower scores on the GHP-5 are indicative of beliefs that personal health is poor and likely to get worse. Conversely, high scores reflect beliefs that personal health is excellent.

Validity for the GHP-5 has been demonstrated through high correlations ($r = .96$) with the 22-item General Health Rating Index (Davies & Ware, 1981). Also, the GHP-5 has achieved a 70% precision rating with the GHP-16 in medical populations (McHorney et al., 1992). McHorney, Ware, Rogers, Raczek, and Lu (1992) provided evidence of reliability when they obtained an alpha coefficient of .78 for the GHP-5 with 969 patients. Additionally, further reliability was shown by Hays, Marshall, Wang, and Sherbourne's (1994) results, which included an alpha coefficient of .78 in a sample of 856 patients. The alpha coefficient for the present sample was .69.

Biosocial Measures

Gender was the only biosocial measure.

Psychological Measures

Personal Resiliency Beliefs Scale (PRBS; Holmes, 2001; see Appendix C) was used to measure levels of resiliency to traumatic or stressful events. The scale is a 30-item, self-report instrument that uses a four point scale ranging from 1 (strongly disagree)

to 4 (strongly agree). The PRBS more specifically measures how strongly an individual feels a sense of meaningfulness/determination, the degree to which spirituality is utilized as a support during stressful events, and how much one perceives that he or she matters to others. The scale has four factors: meaningfulness/determination, spiritual support, negativity/helplessness, and mattering. Examples of meaningfulness/determination are, “I am a survivor” and “I have a strong will that helps me to keep going even through the toughest experiences”. Spiritual Support items are “my faith/spirituality gives me strength during times of hardship” and “if something goes wrong, I go to a higher power for help”; negativity/helplessness items are “when bad things happen, I just want to give up” and “I expect the worst will happen”; finally, mattering items include “there is someone in my life who would be there no matter what” and “when something bad happens, I feel like there is someone I could talk to”. An unpublished study (Holmes, 2001) revealed reliability for the measure at .90. Additionally, concurrent validity for the measure has been demonstrated by significant correlations with other variables such as with distress as measured by the BSI (-.45), optimism as measured by the LOT (.65), social support as measured by SPS (.62), and subjective well-being as measured by the PANAS and SWLS (.52). The alpha coefficient for the overall score for the present sample was .87. The alpha coefficients for the subscales were as follows: meaningfulness/determination (.88), spiritual support (.95), negativity/helplessness (.67), and mattering (.76).

Revised Ways of Coping Questionnaire (WOCQ-R; Folkman & Lazarus, 1980, 1988; Long, 1992; see Appendix D) was originally designed to assess coping strategies that an individual employs to handle a specific situation. Because Folkman and Lazarus

(1980, 1988) use a process oriented approach rather than a trait approach, it is important to examine the participants coping in one context. The measure used for this study was a revision of the WOCQ. This version has been utilized on samples who were experiencing a traumatic event and the items selected from the longer version were selected because they were appropriate for this type of sample. For the purposes of this study, the participants were asked to reflect back on the most stressful event of their experience on September 11, 2001 when responding to the WOCQ-R.

The WOCQ has been through many revisions and many different versions are currently being used in empirical research. The most commonly used version of WOCQ (Folkman & Lazarus, 1988) is a 66 item measure consisting of eight scales: Confrontive Coping, Distancing, Self-Controlling, Seeking Social Support, Accepting Responsibility, Escape-Avoidance, Planful Problem Solving, and Positive Reappraisal. However, a number of researchers have created shorter versions of the WOCQ with item selection based on relevance of the particular sample that is being surveyed. This study used a 30 item version of the WOCQ that was adapted to use with trauma research and was used in a previous study on the WTC as well.

In examining the psychometrics of their scale, Folkman and Lazarus (1988) have suggested that test-retest reliability is not a good measure of a coping instrument's reliability since an individual's response to trauma or stress may vary. Instead, the authors have suggested that reliability of the measure be more appropriately determined by the internal consistency of subscales. Reliability has been established for the individual factors of the Ways of Coping Questionnaire with a range of .61-.79 (Folkman et al., 1986). Because the factors for this study were uninterpretable, no reliability data

were reported. Folkman and Lazarus (1988) have indicated that validity for the Ways of Coping Questionnaire has been demonstrated through its tendency to reveal theoretically consistent results. Although the various versions of the WOCQ are hypothesized to yield certain coping subscales, this measure is typically subjected to Factor Analysis which may yield a different factor structure from sample to sample. For this reason, the factor structure and item loadings for the current sample cannot be determined prior to data analysis.

Current coping theory suggests that both coping efficacy (Conway & Terry, 1992) and perceived controllability (Conway & Terry; Folkman & Lazarus, 1980; Folkman et al., 1986; Lazarus, 1993; Valentiner, Holahan, & Moos, 1994) may affect the type of coping which is utilized and contributes to adjustment. For this reason, this study also included a 4-item scale of coping efficacy (see Appendix E) and a 6-item scale of appraised controllability (see Appendix F) (Conway & Terry).

Coping Self-efficacy (Conway & Terry, 1992; Appendix E) was assessed by a 4-item measure. Coping self-efficacy reflects how satisfied participants are with their efforts to deal with the situation. A sample item is, "Given the circumstances, how well do you think that you handled the situation?" (Conway & Terry). The four items are scored on 5-point scales; two items are positively worded, and two are negatively worded. The scale has an acceptable level of reliability with a Cronbach's alpha of .74 (Conway & Terry). The alpha coefficient for the present sample was .91.

Appraised Controllability (Conway & Terry, 1992; Appendix F) was assessed with a six-item measure with a 5 point scale. A sample item is "How much did you feel that you could influence the outcome of the situation?" Adequate reliability is reported

for the scale with a Cronbach's alpha coefficient of .79 (Conway & Terry). The alpha coefficient for the present sample was .45.

The Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977 G) is a 20-item self-report instrument developed at the National Institute of Mental Health. It has been widely used as a screening instrument for depression in both clinical and nonclinical populations. Participants respond to each item on a 4-point scale (0 = *does not apply at all*, 1 = *does not apply particularly well*, 2 = *applies somewhat*, and 3 = *applies quite well*). Four of the 20 items are worded in a positive direction, whereas the remaining 16 items are worded in a negative direction. The total score is created by summing the values of the 20 responses. Possible scores range from 0 to 60, with higher scores indicating greater depressive mood. The CES-D has established reliability and validity (Radloff). The alpha coefficient for the present sample was .74.

The Life Orientation Questionnaire (LOT; Scheier & Carver, 1985; see Appendix H) measures individual differences in generalized outcome expectancies. It consists of 8 items with a 5-point scale ranging from 0 (strongly disagree) to 4 (strongly agree). Acceptable internal consistency was demonstrated for the scale ($\alpha = .76$), and the measure also has a reported test-retest reliability of .79 using a four-week testing interval (Scheier & Carver, 1985). Scheier & Carver (1985) also found adequate convergent and discriminant validity. The LOT demonstrated moderate positive correlations with self-esteem (.48) and locus of control (.34) while correlating negatively with hopelessness (-.47) and perceived stress (-.55). The alpha coefficient for the present sample was .88

Social Measures

The Social Provisions Scale (SPS; Cutrona & Russell, 1987; see Appendix I) is a self-report inventory with 24 items. It uses a 4-point scale with scores ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). The measure is designed to assess perceived social support. It consists of six subscales, each with 4 items which measure different types of functional social support. The six subscales are based on Weiss's (1974) conceptualization of social functions or "provisions" that one may receive from interpersonal relationships. His provisions can be divided into two broader categories, assistance-related and non-assistance-related. The first category, which is most related to problem solving, includes (a) guidance, which is receiving advice or information, and (b) reliable alliance, which is trusting others to provide tangible assistance. The non-assistance-related category includes provisions that are less related to concrete problem solving, but still relate to assisting in coping with stress. They are (c) reassurance of worth, the sense that one has value, (d) attachment, emotional connection involving feelings of safety and security, (e) social integration, the sense that one shares interests and concerns with others, and (f) opportunity for nurturance, sense that one can provide assistance to improve the well-being of another. For the purposes of this study, one overall score was used.

Russell and Cutrona (1987) demonstrated a six-factor structure via a confirmatory factor analysis. They also provided evidence of discriminant validity by showing convergent validity as reflected in high correlations of the measure with other social support measures and divergent validity through low correlations of the measure with instruments of social desirability, depression, introversion-extroversion, neuroticism, and number of stressful events. Additionally, Russell & Cutrona (1984) found strong

internal consistency in a sample of older adults (α .76 to .84) and test-retest reliabilities ranging from .37 to .66 for the subscales and .59 for the total scale. Mean scores for the total scale in the original sample of college students were 82.45 with a standard deviation of 9.89. The alpha coefficient for the present sample was .90.

Institutional Support (see Appendix J) A three-item questionnaire designed by the author of this study, which is referred to as the Institutional Support Scale (ISS), was used to assess institutional support. For purposes of this study, institutional support was defined as those support services or programs provided by organizations that facilitate social interactions/networking with others or provide assistance with trauma or stress adjustment. Participants rated on a 5-point scale, ranging from not at all (1) to a great extent (5), how much they have utilized certain forms of support related to September 11. The items on this measure refer to: (a) seeking support from a religious or spiritual community; (b) receiving counseling or other mental health services (psychotherapy, crisis lines, support groups); (c) utilization of reunion for NABE members to help deal with this event. Total scores were obtained by summing all items. Higher scores indicate greater utilization of institutional support. Because of the differences in the items, alpha coefficients were not calculated.

Outcome Measures

Subjective Well-Being (Diener, 1984, 1994, 2000) Diener indicates that there are various ways that people measure subjective well-being (SWB), but that SWB should have both a cognitive and affective component and should contain multiple items. He stated that the PANAS (Positive and Negative Affect Scale; Watson, Clark, & Tellegen, 1988), which measures both positive and negative affect, and the Satisfaction with Life

Scale, have been used in combination to assess SWB (Diener, 2000). He also indicated that a person's SWB reflects their subjective appraisal of quality of life, the presence of positive affect, and the absence of negative affect. Based on his definition of SWB and his recommendation of these two measures, the subjective well-being aggregate score is the sum of the standardized Satisfaction with Life scale and the standardized Positive Affect scale then subtracting the standardized Negative Affect score from the sum. This aggregate reflects the combined appraisal of quality of life and positive affect less reported negative affect. The alpha coefficient for the present sample was .83 before 9/11, .86 two weeks after, and .86 one year after 9/11/01.

The Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen & Griffin, 1985; see Appendix K) will be used to assess global life satisfaction. This scale consists of 5 items, with a 7-point scale ranging from strongly disagree (1) to strongly agree (7). This instrument measures life satisfaction as a cognitive-judgmental process and will reflect the cognitive component of subjective well-being. A sample item is "If I could live my life over, I would change almost nothing". Reliability was established for this measure during the initial study of the instrument. Diener et al. (1985) obtained an alpha level of .87 in addition to a 2-month test-retest correlation coefficient of .82. The measure was validated through correlations with 11 other measures of subjective well-being. There were moderate correlations with all the measures except for a measure of the intensity of emotional experience (Diener et al., 1985). There was a low correlation (.02) with the Marlowe-Crowne, suggesting that the SWLS does not evoke a response set reflecting social desirability. Additionally, the SWLS had expected correlations with certain personality measures (i.e., self-esteem, .54; symptom checklist, -.41; neuroticism,

-.48; and socialability, .20). These findings suggest that those who report greater life satisfaction tend to be less likely to present with psychopathology (Diener et al., 1985). This measure was used in conjunction with the PANAS to yield a score of SWB. The alpha coefficients for the present sample were .72 before, .79 two weeks after, and .76 one year after 9/11/01.

The Positive and Negative Affect Schedule (PANAS, Watson, Clark, & Tellegen, 1988; see Appendix L) measures the affective component of subjective well-being. This 20-item instrument consists of two 10-item lists of feelings, one positive (excited, strong, proud) and one negative (guilty, irritable, afraid). Participants were asked to indicate the degree to which they have felt a certain feeling during the past few weeks, (1) very slightly/not at all to (5) extremely. The scales are each summed to provide a score for positive affect and for negative affect. Scores range from 10 to 50. Higher scores indicate higher levels of positive affect on the Positive Affect (PA) scale and negative affect on the Negative Affect (NA) scale. In the initial study of the instrument, Watson et al. (1988) obtained alpha coefficients of .88 for the general PA and .87 for the general NA, and test-retest coefficients of .68 and .71 at intervals of 8 weeks for the PA and NA scales, respectively. Watson et al. (1988) demonstrated external validity through correlations with measures of symptoms of distress and dysfunction (Hopkins Symptom Checklist, HSCL), depression (Beck Depression Inventory, BDI), and anxiety (State-Trait Anxiety Inventory State Anxiety Scale, A-State). The PA scale had negative correlations with the HSCL (-.19), BDI (-.35), and A-State (-.35), while the NA was positively correlated with the HSCL (.74), BDI (.56), and A-State (.51). This scale was used in conjunction with the SWLS to form the score for subjective well-being.

However, reliability was established for the scale with alpha coefficients for the positive affect subscale as .84 before, .86 right after, and .85 one year after September 11, 2001. Alpha coefficients for the negative subscale were .82 before, .89 right after, and .89 one year after 9/11/01.

Measure of Trauma

Impact of Event Scale (IES; Horowitz, Wilner, & Alvarez, 1979; see Appendix M) measures the reactions of individuals to distressing events. This is a 15 item, self report instrument with two subscales: intrusion and avoidance. Item responses are based on a 4-point scale ranging from 1 (not at all) to 4 (often). The IES specifically measures the subjective impact of a stressful event on an individual. Horowitz et al., (1979) report that psychological responses to stressful events are often divided into the two major response sets which reflect the subscales of the measure: intrusion and avoidance. Intrusiveness is reflected in unwanted thoughts, disturbing dreams, and waves of strong feelings. Avoidance is characterized by denial of the consequences of the event, blunted affect or sensation, and inhibited behavior.

Horowitz et al. (1979) report acceptable internal consistency for the subscales with alphas of .78 for intrusion and .82 for avoidance. Moderate correlation between the two subscales (.42) indicates relation but not redundancy. Test-retest reliability was demonstrated with alpha coefficients of .87 for the total scale, .89 for the intrusion subscale, and .79 for the avoidance subscale. Limited validity data was presented in the form of comparison of patients' scores on the IES with the clinical opinion of experienced observers. Findings suggested that the clinical impressions of the observers matched the expected scores of the patient on the IES. The total scale score was used in

this sample. The alpha coefficient for the present sample was .61 two weeks after and .74 one year after the terrorist attacks.

Job Satisfaction (see Appendix N) was assessed with 3 single item measures in this study. The first single item measure examined job satisfaction retrospectively before September 11, 2001, the second measure assessed job satisfaction two weeks after 9/11/01, and the third measure assessed job satisfaction one year after September 11, 2001. Items were “Overall, how satisfied were/are you with your job before/after September 11?” The items utilized a seven point scale. While there is no established reliability or validity for this type of measure, research has shown that single item measures of overall job satisfaction tend to correlate with other measures of job satisfaction ($r=.67$) (Nagy, 2002; Wanous & Hudy, 2001; Wanous & Lawler, 1972; Wanous & Reichers, 1996; Wanous, Reichers, & Hudy, 1997). Additionally, the same body of research has suggested that single item measures of overall job satisfaction may be superior to multi-item measures because single items are often easier to take, have greater face-validity, are less expensive, and take less time. Also, participants are able to tap the aspects of work that produce satisfaction for them rather than having aspects of work that may or may not apply be set forth by a multi-item measure (Nagy, 2002; Wanous & Hudy, 2001; Wanous & Lawler, 1972; Wanous & Reichers, 1996; Wanous, Reichers, & Hudy, 1997). No alpha coefficient could be computed on the present sample because the scale contained only one item.

Procedure

This study was conducted via an on-line survey. The decision to utilize an online survey was based on the fact that the organization comprising the sample preferred an

online study since the internet had been typically used for correspondence and communication in this organization and it provided more confidentiality than would occur if potential participants had to complete paper and pencil measures and mail them in (e.g. postmark and return address could indicate location). The sample for this study was a non-random, geographically heterogeneous group of people who belong to a particular professional organization. A condition of the organization's agreement to participate included the least invasive and anonymous method of collecting data, which was concluded to be an on-line survey. Utilization of this form of data collection also increased the possibility of obtaining participation from members from across the nation. A general drawback of Internet research is the sample restriction to those who have Internet access. However, in this study, the members of the sample likely had internet access at work and since the invitation to participate came from a professional organization, they were more likely to fill it out at work.

The organization conducted several recruitment activities. They announced the study at a national meeting where they encouraged all members who were in New York City on September 11 to consider participating. They also included an announcement and an article in the organization newsletter, and they posted an announcement and encouragement to participate on the organization's website. Additionally, at the time of data collection, the organization sent out email announcements to all members, family members, and affiliates of NABE present in the World Trade Center Towers on September 11, 2001. Subsequent email reminders were sent from the organization at one and two months into the data collection. Because the organization wanted to control the

email list for confidentiality purposes, the exact number of people invited to participate is unknown.

Each potential participant in the study was directed to go to a website set up specifically for this study. The website included an introductory letter with a consent clause stating that by completing the questionnaire, the individual is indicating consent to participate in the study. The questionnaires included the General Health Perceptions-5 Subscale (GHP-5), The Brief Symptom Inventory (BSI-18), Personal Resiliency Beliefs Scale (PRBS), Ways of Coping Questionnaire-Revised (WOCQ-R), Life Orientation Questionnaire (LOT), Social Provisions Scale (SPS), Institutional Support Scale (ISS), Satisfaction with Life Scale (SWLS), Positive and Negative Affect Scale (PANAS), Impact of Event Scale (IES), a measure of Job Satisfaction, a demographic questionnaire designed for this study, a question about positive events resulting from 9/11, and an open ended invitation for comments or positive outcomes of the participants' experiences. Completion of the packet took approximately 30-45 minutes depending on response time to open-ended questions.

Data Analyses

Primary Analysis

Pearson product moment correlations and regression analyses were used to test the following hypotheses as indicated.

Hypothesis 1: Relation of perceived physical health status to adjustment

Hypotheses 1a-c were tested using zero-order correlational analyses.

Hypothesis 2: Relation of presence of somatic symptoms to adjustment

Hypotheses 2a-c were tested using zero-order correlational analyses.

Hypothesis 3: Relation of mental health to adjustment

Hypotheses 3a-c were tested using zero-order correlational analyses.

Hypothesis 4: Relation of resiliency to adjustment

Hypotheses 4a-c were tested using zero-order correlational analyses.

Hypothesis 5: Relation of optimism to adjustment

Hypotheses 5a-c were tested using zero-order correlational analyses.

Hypothesis 6: Relation of avoidance-coping to adjustment

Hypotheses 6a-c were intended to be tested using zero-order correlational analyses.

Hypothesis 7: Relation of problem-focused coping to adjustment

Hypothesis 7a-c was intended to be tested using three hierarchical linear regressions, one for subjective well-being, job satisfaction, and impact of event. For each regression, controllability was intended to be entered in the first step of each regression equation. Problem-focused coping was intended to be entered in the second step, and an interaction between controllability and problem-focused coping was intended to be entered in the third step.

Hypothesis 8: Relation of emotion focused coping to adjustment

Hypothesis 8a-c were intended to be tested using three hierarchical linear regressions, one for subjective well-being, job satisfaction, and impact of event. For each regression, controllability would have been entered in the first step of the regression equation. Emotion-focused coping would have been entered in the second step, and an interaction between controllability and emotion-focused coping would have been entered in the third step.

Hypothesis 9: Relation of social support to adjustment

Hypotheses 9a-c were tested using zero-order correlational analyses.

Hypothesis 10: Relation of institutional support to adjustment

Hypotheses 10a-c were tested using zero-order correlational analyses.

Hypothesis 11: Relation of gender to impact of event

Hypothesis 11 was tested using an independent samples T-test.

Hypothesis 12: Role of biomedical factors in explaining variance in adjustment

Hypothesis 13: Role of psychological factors in explaining variance in adjustment

Hypothesis 14: Role of social factors in explaining variance in adjustment

Hypothesis 15: Role of biosocial factors in explaining variance in adjustment

Hypothesis 12a-c, 13a-c, 14a-c, and 15a-c were tested using three hierarchical linear regressions, one for subjective well-being, job satisfaction, and impact of event.

Hierarchical linear regression was utilized because the order the variables were entered is based on the biopsychosocial model, and it was expected that certain variables would account for more variance than others. For each regression, as the implied order of the model (Hoffman & Driscoll, 2000), psychological factors (depression, anxiety, resiliency, optimism, and coping) were entered in the first step of the regression equation because they are predicted to account for the most variance. Social factors (social support and institutional support) were entered in the second step, biosocial factors (gender) were entered in the third step and biomedical factors (general health perceptions and somatic symptomatology) were entered in the fourth step because it was expected that they would account for the least amount of variance. The significance and effect sizes were

examined for each step to determine how much of the variance in adjustment is accounted for by each level of the model.

Chapter 5

Results

Preliminary Analyses

The means, standard deviations, and frequencies of important demographic data about the participants in the study, such as their age, gender, ethnicity, and educational level are displayed in Table 1. Additionally, the means, standard deviations, and alpha coefficients were calculated for all measures of the study and are shown in Table 2. The alpha coefficients for measures ranged from .49-.95. The Perceived Controllability scale had an alpha score of .49, and the Coping Efficacy scale had a Cronbach's alpha of -.91. These low internal consistency estimates suggest inadequate reliability. Therefore, the two instruments just identified were excluded from the primary analyses (Hypotheses 7 and 8). Additionally, the revised Ways of Coping Scale selected to measure coping in the sample failed to yield an interpretable factor structure that was consistent with previous coping literature. For this reason, in addition to the inadequate reliability of the Perceived Controllability scale and the Coping Efficacy scale, the variable of coping was not analyzed for this study (Hypothesis 6).

In addition, the means and standard deviations of dependent measures for this sample were compared to normative data. However, because no study on a comparable group of individuals has been conducted using the same variables, normative data with other populations is provided as a reference. Additionally, because no normative data for

Table 1

Participant Demographics

GENDER		Frequency	Percent
Valid	Female	20	20.8
	Male	71	74.0
	Total	91	94.8
Missing		5	5.2
Total		96	100
ETHNICITY		Frequency	Percent
Valid	African-American	1	1.0
	European American	88	91.7
	Latino	1	1.0
	Other	2	2.1
	Total	92	95.8
Missing	System	4	4.2
Total		96	100
EDUCATIONAL LEVEL		Frequency	Percent
Valid	Some College	1	1.0
	College Grad	13	13.5
	Master's Degree	42	43.8
	PhD	36	37.5
	Total	92	95.8
Missing	System	4	4.2
Total		96	100.0

	N	Minimum	Maximum	Mean	Std Dev
AGE	91	25.00	75.00	48.7802	10.9796

Table 2
Means, Standard Deviations, Range of Scores and Alphas of All Variables

Criterion Variables

Measure	Alpha	Minimum	Maximum	Mean	Std. Deviation
Subjective Well Being Before N=76	.83	-8.86	4.98	-2.39	2.20
Subjective Well Being After N=75	.86	-6.20	4.55	3.99	2.03
Subjective Well Being 1 year N=74	.86	-7.52	4.58	-4.47	2.14
Satisfaction With Life Scale Before (5 Items) N=91	.72	12.00	35.00	24.34	5.00
Satisfaction With Life Scale After (5 Items) N=91	.79	10.00	34.00	24.67	5.30
Satisfaction With Life Scale 1 year (5 Items) N=91	.76	9.00	35.00	24.30	5.18
Positive and Negative Affect Scale Positive Before (10 items) N=77	.84	21.00	50.00	36.42	5.94
Positive and Negative Affect Scale Negative Before (10 items) N=78	.82	10.00	35.00	13.82	4.11
Positive and Negative Affect Scale Positive After (10 items) N=77	.86	16.00	50.00	35.05	7.37
Positive and Negative Affect Scale Negative After (10 items) N=78	.89	10.00	45.00	27.04	9.02
Positive and Negative Affect Scale Positive 1 year (10 items) N=76	.85	23.00	50.00	36.92	6.06
Positive and Negative Affect Scale Negative 1 year (10 items) N=78	.89	10.00	37.00	18.00	6.49
Impact of Events Scale After (14 items) N=91	.61	23.00	50.00	35.43	6.28
Impact of Events Scale 1 year (14 items) N=91	.74	21.00	53.00	35.19	7.30

Table 2 Continued
Means, Standard Deviations, Range of Scores and Alphas of All Variables

Criterion Variables

Job Satisfaction Before (1 item) N=93	0	1.00	7.00	5.51	1.40
Job Satisfaction After (1 item) N=93	0	1.00	7.00	5.01	1.70
Job Satisfaction 1 year (1 item) N=92	0	1.00	7.00	5.01	1.62

Predictor Variables

Measure	Alpha	Minimum	Maximum	Mean	Std. Deviation
Center for Epidemiological Studies Depression Scale (20 items) N=85	.74	.00	38.00	23.22	7.78
Personal Resiliency Beliefs Scale (Average) (PRBS) (30 items) N=93	.87	2.43	4.00	3.16	.34
PRBS meaningfulness/determination (12 items) N=93	.88	2.42	4.00	3.31	.36
PRBS Spirituality (8 items) N=93	.95	1.00	4.00	2.74	.88
PRBS Mattering (4 items) N=93	.76	1.67	4.00	3.42	.56
PRBS Helplessness (6 items) N=93	.67	2.00	4.00	3.24	.45
Life Orientation Questionnaire Revised (6 items) N=88	.88	7.00	24.00	16.91	3.98

Table 2 Continued
*Means, Standard Deviations, Range of
 Scores and Alphas of All Variables*

Predictor Variables

Social Provisions Scale (24 items) N=24	.90	61.00	96.00	84.05	8.92
Coping Efficacy (4 items) N=92	-.91	10.00	17.00	14.29	1.58
Perceived Controllability (9 items) N=91	.45	9.00	41.00	25.55	4.07
Institutional Support (3 items) N=82	0	3.00	14.00	5.80	2.65
General Health Perceptions (5 items) N=93	.69	9.00	25.00	20.70	3.13

the Subjective Well-Being Aggregate could be found, the individual components of the aggregate, Satisfaction with Life Scale (SWLS) and the Positive and Negative Affect Scale (PANAS) are presented. Although no statistical comparisons were made, general comparisons provide some normative information for this group. This sample showed a similar average SWLS score two weeks before ($M=24.34$, $SD=5.00$), two weeks after ($M=24.67$, $SD=5.30$) and one year after ($M=24.30$, $SD=5.18$) September 11 to an undergraduate sample ($M=23.5$, $SD=6.43$) and an elderly sample ($M=25.8$, SD =none reported) (Diener et al., 1985). Participants in this study also reported similar scores on the positive affect factor of the PANAS two weeks before ($M=36.42$, $SD=5.94$), two weeks after ($M=35.05$, $SD=7.37$) and one year after ($M=36.92$, $SD=6.06$) 9/11 to a general sample ($M=35.00$, $SD=6.5$) (Watson, Clark, & Tellegan, 1988). However, there were differences in reported scores for the negative factor of the PANAS in this sample and a general sample ($M=18.1$, $SD=5.9$) (Watson, Clark, and Tellegan, 1988). Two weeks before 9/11, this sample reported a lower average level of negative affect ($M=13.82$, $SD=4.11$) than the general sample, but two weeks after 9/11, this sample had a much higher report of negative affect ($M=27.04$, $SD=9.02$) than the general sample. At one year after the traumatic event, this sample had returned to a level of negative affect ($M=18.00$, $SD=6.49$) that is similar to levels of negative affect in the general sample but higher than their scores at 2 weeks before 9/11. Impact of Events (IES) scores for this sample were much higher two weeks after 9/11 ($M=35.43$, $SD=6.28$) and one year after 9/11 ($M=35.19$, $SD=7.30$) than a sample of medical students ($M=9.8$, $SD=8.8$) (Horowitz et al. 1979). Moreover, the participants' IES scores at both points in time were more consistent with a sample of individuals from a stress clinic ($M=38.7$, $SD=19.6$) (Horowitz

et al. 1979). Because the job satisfaction measure used in this study was designed specifically for the study, no normative data exists.

Table 3 displays a correlation matrix, which presents the relationships between all variables in the present study. In order to guard against Type I error, minimum alpha levels were set at .01 rather than .05. The correlations indicate that gender, ethnicity, and educational level were not significantly correlated to any other variables. Age, however, was correlated to impact of event one year after 9/11 ($r = -.31$), indicating that older participants had less impact of event one year after the terrorist attacks.

Primary Analyses

After conducting the above-mentioned preliminary analyses, primary analyses were carried out to test the 15 hypotheses in this study. The primary hypotheses for the biopsychosocial approach to this study include an examination of: (a) the relation of biomedical variables to adjustment variables, (b) the relation of psychological variables to adjustment variables, (c) the relation of social variables to adjustment, and (d) the relation of biosocial variables to adjustment. Again, in order to guard against Type I error, minimum alpha levels were set at .01 rather than .05.

Table 3

Correlations between all variables (A description of all variables used within Table 3 is listed below)

<u>Variable</u>	<u>Description</u>
SWB_B	Subjective Wellbeing before 9/11
SWB_A	Subjective Wellbeing 2 weeks after 9/11
SWB_N	Subjective Wellbeing one year after 9/11
IESA	Impact of Events Scale 2 weeks after 9/11
IESB	Impact of Events Scale one year after 9/11
JOBBEFO	Job Satisfaction before 9/11
JOBAFTER	Job Satisfaction 2 weeks after 9/11
JOBNOW	Job Satisfaction one year after 9/11
CESD	Center for Epidemiological Studies Depression Scale
PRBS	Personal Resiliency Beliefs Scale
REEMP	Resiliency- meaningfulness
RESPIR	Resiliency- spirituality
REMATTER	Resiliency- mattering
RENEG	Resiliency- helplessness
LOT	Life Orientation Questionnaire
SPS	Social Provisions Scale
INSTUSUP	Institutional Support
GHP	General Health Perceptions
GENDER	Gender
AGE	Age
ETHNICIT	Ethnicity
EDLEV	Educational level

Table 3 (Continued)
Correlations between all variables

	SWB_B	SWB_A	SWB_N	IESA	IESB	JOBBEFO	JOBAFTER	JOBNOW	CESD	PRBS	REEMP
SWB_B	1.00										
SWB_A	0.59**	1.00									
SWB_N	0.51**	0.69**	1.00								
IESA	-0.23*	-0.32**	-0.43**	1.00							
IESB	-0.24*	-0.49**	-0.31**	0.67**	1.00						
JOBBEFO	0.42**	0.18	0.10	-0.12	-0.02	1.00					
JOBAFTER	0.37**	0.39**	0.38**	-0.21*	-0.15	0.66**	1.00				
JOBNOW	0.10	0.24*	0.38**	-0.09	-0.15	0.29**	0.37**	1.00			
CESD	-0.21	-0.22	-0.25*	-0.16	0.24*	0.10	-0.02	-0.02	1.00		
PRBS	0.30**	0.38**	0.34**	-0.05	-0.20	0.10	0.14	0.06	-0.20	1.00	
REEMP	0.24	0.36**	0.45**	-0.16	-0.15	0.16	0.24*	0.19	-0.03	0.61**	1.00
RESPIR	0.07	0.08	-0.02	0.11	-0.16	-0.03	-0.06	-0.15	-0.19	0.73**	0.02
REMATTER	0.29*	0.15	0.16	-0.01	0.16	0.03	0.08	0.08	-0.03	0.32**	0.16
RENEG	0.33**	0.56**	0.53**	-0.22*	-0.22*	0.15	0.23*	0.23*	-0.17	0.63**	0.51**
LOT	0.39**	0.46**	0.41**	-0.29**	-0.29**	0.14	0.18	0.30**	-0.19	0.42**	0.44**
SPS	0.27*	0.25*	0.24*	-0.09	-0.12	0.08	0.10	0.08	-0.10	0.35**	0.29**
INSTUSUP	-0.11	-0.12	-0.08	0.13	0.09	0.10	0.18	0.19	0.02	-0.05	-0.04
GHP	0.22	0.14	0.13	0.05	0.21*	0.28**	0.09	-0.07	0.15	0.32**	0.43**
GENDER	-0.01	0.07	0.06	-0.08	-0.11	-0.07	0.00	0.00	0.10	-0.02	0.06
AGE	0.06	0.19	-0.10	-0.04	-0.31**	0.03	0.00	0.00	-0.15	0.14	-0.04
ETHNICIT	0.06	0.02	0.08	-0.09	-0.02	0.14	0.14	0.05	0.02	-0.06	0.04
EDLEV	0.07	0.05	-0.02	-0.19	-0.10	0.17	0.09	-0.06	0.11	-0.03	0.09

* = $p < .05$ ** = $p < .01$

Note: This correlation matrix is continued on the next page. Also, the full names of all measures are provided in Table 2.

Table 3 (Continued)
Correlations between all variables

	RESPIR	REMATTER	RENEG	LOT	SPS	INSTUSUP	GHP	GENDER	AGE	ETHNICIT	EDLEV
SWB_B											
SWB_A											
SWB_N											
IESA											
IESB											
JOBBEFO											
JOBAFTER											
JOBNOW											
CESD											
PRBS											
REEMP											
RESPIR	1.00										
REMATTER	-0.02	1.00									
RENEG	0.14	0.20*	1.00								
LOT	0.00	0.27*	0.64**	1.00							
SPS	-0.02	0.69**	0.33**	0.41**	1.00						
INSTUSUP	-0.05	0.00	0.02	-0.09	0.01	1.00					
GHP	0.07	0.12	0.24*	0.24*	0.13	-0.17	1.00				
GENDER	-0.07	-0.13	0.13	0.04	-0.14	0.00	0.14	1.00			
AGE	0.25*	-0.07	0.03	0.08	0.02	0.17	-0.15	0.05	1.00		
ETHNICIT	-0.09	-0.11	0.05	-0.02	-0.02	0.07	0.06	0.12	-0.23*	1.00	
EDLEV	-0.16	0.07	0.13	0.10	0.09	0.07	0.16	0.26*	0.25*	-0.05	1.00

* = $p < .05$ ** = $p < .01$

Note: The full names of all measures are provided in Table 2.

Biomedical factors and adjustment

Hypothesis 1: Perceived physical health status as indicated by perceptions of general health, with higher scores indicating greater physical health perceptions, will be positively related to indicators of adjustment, such that good perceptions of physical health will be related to higher levels of adjustment two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 1a: Perceived physical health status as indicated by perceptions of general health, with higher scores indicating greater physical health perceptions, will be positively related to subjective well-being.

To explore this relationship, correlations between GHP-5 and SWB were examined. As indicated in Table 3, no relationship was found between perceptions of general health and SWB.

Hypothesis 1b: Perceived physical health status as indicated by perceptions of general health (GHP-5), with higher scores indicating greater physical health perceptions, will be positively related to job satisfaction.

This hypothesis was tested using correlational analysis. General health perceptions, as measured by the GHP-5, had a small but significant relationship to job satisfaction before September 11, 2001, ($r = .28, p < .01$), such that people who reported more positive health perceptions had higher job satisfaction before 9/11. General health perceptions were not related to job satisfaction 2 weeks after 9/11 or 1 year later.

Hypothesis 1c: Perceived physical health status as indicated by perceptions of general health, with higher scores indicating greater physical health perceptions, will be negatively related to reported impact of traumatic event.

To explore this relationship, correlations between GHP-5 and impact of event were examined. As indicated in Table 3, no relationship was found between perceptions of general health and impact of event at any point in time.

Hypothesis 2: The reported presence of somatic symptoms of distress will be negatively related to adjustment variables, such that greater presence of somatic symptoms will relate to poorer adjustment.

Hypothesis 2 could not be analyzed as the Center for Epidemiological Studies-Depression scale (CES-D) was substituted for the BSI-18. Because of copyright issues related to use on the Internet, the BSI-18 could not be used in this study.

Psychological factors and adjustment

Hypothesis 3: Mental health will be positively related to overall adjustment, such that better mental health relates to better adjustment.

Hypothesis 3 revised: Mental health will be negatively related to overall adjustment, such that lower levels of depression relate to better adjustment two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 3a: Mental health, as defined by level of depression, will be negatively related to subjective wellbeing.

Correlational analysis was used to measure the relationship between mental health and subjective wellbeing. No relationship was found for SWB before 9/11, two weeks after, or one year after the event.

Hypothesis 3b: Mental health, as defined by level of depression, will be negatively related to job satisfaction.

Correlational analysis revealed no relationship between depression as measured by the CES-D and job satisfaction.

Hypothesis 3c: Mental health, as defined by level of depression, will be positively related to impact of events, such that greater levels of depression relate to greater impact of event.

No relationship between depression and impact of event was found for the overall score for IES at either two weeks after or one year after 9/11.

Hypothesis 4: Higher reported resiliency will be positively related to adjustment such that those with higher reported levels of resiliency will also report better adjustment.

Hypothesis 4a: Higher reported resiliency will be positively related to subjective well-being.

As expected, correlational analyses revealed positive relationships between resiliency as measured by the PRBS and SWB before September 11 ($r = .301, p < .01$), two weeks after 9/11 ($r = .38, p < .01$), and at one year after September 11th ($r = .34, p < .01$). In addition to the overall resiliency measure, specific factors were also positively correlated to SWB. The meaningfulness/determination subscale was positively correlated with SWB two weeks after ($r = .36, p < .01$) and one year after ($r = .45, p < .01$) 9/11. This subscale, however, was not correlated with SWB before 9/11. Neither the perceptions of mattering nor the spiritual support subscales were related to SWB at any point. Finally, the negativity/helplessness subscale was positively related to SWB (where higher scores indicate less negativity) two weeks after ($r = .56, p < .01$) and one year after ($r = .53, p < .01$) September 11, 2001. Because this scale is still in the development

phase, both overall scores and individual subscales were examined in order to assist in further validation of the instrument and to determine whether it is more useful to look at an overall score or subscale scores.

Hypothesis 4b: Higher reported resiliency will be positively related to job satisfaction.

There were no significant relationships between the overall resiliency score or any of its factors and job satisfaction.

Hypothesis 4c: Higher reported resiliency will be negatively related to impact of event.

No significant relationships between overall resiliency or any subscales and impact of event were found.

Hypothesis 5: Higher levels of optimism (LOT) will be positively related to overall adjustment, such that more optimism will be related to better adjustment.

Hypothesis 5a: Higher levels of optimism (LOT) will be positively related to subjective well-being.

Correlational analyses revealed a positive relationship between optimism and SWB before ($r = .39, p < .01$), two weeks after ($r = .47, p < .01$), and at one year after the plane crashes into the World Trade Center ($r = .41, p < .01$). These findings support the hypothesis and indicate that those people who reported higher levels of optimism also reported better SWB both before and after September 11.

Hypothesis 5b: Higher levels of optimism (LOT) will be positively related to job satisfaction.

Optimism was significantly related to job satisfaction at one year after 9/11 ($r = .30, p < .01$). However, no significant relationship was found for optimism and job satisfaction right before or right after the trauma.

Hypothesis 5c: Higher levels of optimism (LOT) will be negatively related to impact of event.

As hypothesized, the overall impact of event scale was negatively related to optimism ($r = -.29, p < .01$) at two weeks after the event and ($r = -.29, p < .01$) at one year after 9/11, indicating that those who reported higher levels of optimism also reported lower levels of impact of event.

Hypothesis 6: Higher levels of avoidance coping will be negatively related to adjustment, so that higher use of avoidance coping will relate to worse adjustment outcomes.

This hypothesis could not be tested because the factor structure of the coping measure with the current data set was not consistent with previous research.

Hypothesis 7: When perceived controllability is high, more problem-focused coping strategies will be positively related to adjustment, with poor adjustment predicted by less problem-focused coping.

Because the perceived controllability measure was not found to have adequate reliability ($\alpha = .49$), hypothesis 7 were not tested.

Hypothesis 8: When perceived controllability is low, more emotion-focused coping strategies will be positively associated with adjustment, such that less emotion-focused coping will predict poorer adjustment.

Because the perceived controllability measure was not found to have adequate reliability ($\alpha = .49$), hypothesis 8 was not tested.

Social variables and adjustment

Hypothesis 9: Higher reported levels of social support will be positively related to adjustment, such that higher reported social support would be related to better adjustment two weeks before, two weeks after, and 1 year after 9/11.

Hypothesis 9a: Higher reported levels of social support will be positively related to subjective well-being.

Correlational analyses revealed no relationship between social support and SWB right before, right after, and one year after the September 11 attacks.

Hypothesis 9b: Higher reported levels of social support will be positively related to job satisfaction.

No significant relationship was found between job satisfaction and social support.

Hypothesis 9c: Higher reported levels of social support will be negatively related to impact of event.

Correlational analyses did not reveal a significant relationship between impact of event and social support.

Hypothesis 10: Utilization of institutional support will be positively associated with overall adjustment, so that more reported use of institutional support would relate to better adjustment.

Hypothesis 10a: Utilization of institutional support will be positively associated with subjective well-being.

No significant relationship was found between institutional support and SWB.

Hypothesis 10b: Utilization of institutional support will be positively associated with job satisfaction.

Correlational analyses did not reveal any significant relationship between institutional support and job satisfaction.

Hypothesis 10c: Utilization of institutional support will be negatively associated with impact of event.

There was no relationship between the overall impact of events scale and institutional support.

Biosocial factors and adjustment

Hypothesis 11: Gender will be significantly related to adjustment such that women will have significantly higher scores on impact of event than men.

Independent Samples T-test revealed no gender differences in the impact of events scale either 2 weeks after 9/11/01 ($t=74$, $p=.46$) or one year after September 11 ($t=1.04$, $p=.30$).

Summary of findings

Biomedically, the only significant finding was that general health perceptions had a small but significant relationship to job satisfaction before September 11, 2001, indicating that people who reported more positive health perceptions had higher job satisfaction before 9/11.

Psychologically, resiliency was significantly related to SWB before September 11, two weeks after 9/11, and at one year after September 11th. In addition to the overall resiliency measure, the meaningfulness/determination subscale was positively correlated with SWB two weeks after and one year after 9/11. This subscale, however, was not

correlated with SWB before 9/11. Neither the perceptions of mattering nor the spiritual support subscales were related to SWB at any point. Finally, the negativity/helplessness subscale was positively related to SWB (where higher scores indicate less negativity) two weeks after and one year after September 11, 2001. Positive relationships between optimism and SWB were also found to be significant before, two weeks after, and at one year after the World Trade Center attacks. Optimism was also significantly related to job satisfaction at one year after 9/11. As hypothesized, the overall impact of event scale was negatively related to optimism at two weeks after the event and at one year after 9/11, indicating that those who reported higher levels of optimism also reported lower levels of impact of event.

There were no significant findings for either social variables or biosocial variables.

Biopsychosocial model

The following hypothesis tested the study's theoretical structure of the biopsychosocial model by exploring the predictive ability of biomedical factors (i.e., general health perceptions), psychological variables (i.e., depression, resiliency, optimism, and coping), social factors (i.e., social support and institutional support), and biosocial variables (i.e., gender) on outcome variables measuring adjustment. For regression analyses, all R square are adjusted R square in order to account for shrinkage due to sample size.

Hypothesis 12: Biomedical factors will account for significant variance in overall adjustment.

Hypothesis 12a: Biomedical factors will account for significant variance in subjective well-being.

To test this hypothesis, as indicated by the implied order of the biopsychosocial model (Hoffman & Driscoll, 2000), psychological factors (depression, four resiliency scales, and optimism,) were entered as a block in the first step of the regression equation carried out on the dependent variable, subjective well-being. Social factors (social support and institutional support) were entered in the second step, a biosocial factor (gender) was entered in the third step and a biomedical factor (general health perceptions) was entered in the fourth step. The results of the regression analysis, found on Tables 4, 5, and 6, indicate that biomedical factors did not account for a significant part of the variance in SWB before, two weeks after, or 1 year after September 11.

Hypothesis 12b: Biomedical factors will account for significant variance in job satisfaction.

In this hierarchical multiple regression, conducted on the dependent variable job satisfaction, psychological factors (depression, four resiliency scales, and optimism) were entered as a block in the first step of the regression equation carried out on the dependent variable, subjective well-being. Social factors (social support and institutional support) were entered in the second step, a biosocial factor (gender) was entered in the third step and a biomedical factor (general health perceptions) was entered in the fourth step. The results of the regression analysis, found on Tables 7,8, and 9, indicate that biomedical factors did not predict a significant amount of the variance in job satisfaction before, two weeks after or one year after September 11.

Hypothesis 12c: Biomedical factors will account for significant variance in impact of event.

In this hierarchical multiple regression, conducted on the dependent variable impact of event, psychological factors (depression, four resiliency scales, and optimism) were entered as a block in the first step of the regression equation carried out on the dependent variable, subjective well-being. Social factors (social support and institutional support) were entered in the second step, a biosocial factor (gender) was entered in the third step and a biomedical factor (general health perceptions) was entered in the fourth step. The results of the regression analysis, found on Tables 10 and 11, indicate that biomedical factors did not predict a significant amount of the variance in impact of event two weeks after 9/11, but did predict a significant amount of variance in impact of event one year later, $F(1, 85)=3.85$, $p=.001$. The first block of variables accounted for 11.3% of the variance, the second block accounted for an additional 1.5%, the third block another 0.1%, and the biomedical block explained an additional 10.1% of the variance beyond that associated with the other steps. While the first block was significant, the following two blocks were not. When the fourth block, the biomedical block was added, there was a significant increment in the amount of variance from the other three blocks.

Hypothesis 13: Psychological factors will significantly contribute to the variance in overall adjustment.

Table 5
Hierarchical Blockwise Multiple Regression Analysis with Biopsychosocial Variables as Predictors and SWB Two weeks after 9/11 as Criterion

SOURCE	Df	adjR ²	?R ²	FCh	SigFCh	B	T	Sig
Step 1								
Psychological Variables	6,89	.22	.27	5.54	.00			
CES-D						-.09	-.98	.33
LOT						.21	1.8	.08
RESEMP						.08	.73	.47
RESSPIR						.01	.12	.90
RESMAT						.01	.11	.91
RESNEG						.29	2.36	.02
Social Variables	2,87	.22	.01	.55	.58			
SPS						.07	.55	.58
INSUP						-.08	-.91	.37
Biosocial Variable	1,86	.21	.001	.16	.70			
GENDER						.04	.40	.70
Biomedical Variable	1,85	.20	.001	.15	.70			
GHP-5						-.04	-.39	.70
N=96								

Table 6
Hierarchical Blockwise Multiple Regression Analysis with Biopsychosocial Variables as Predictors and SWB One Year after 9/11 as Criterion

SOURCE	Df	adjR ²	?R ²	FCh	SigFCh	B	T	Sig
Step 1								
Psychological Variables	6,89	.23	.28	5.80	.00			
CES-D						-.17	-1.80	.08
LOT						.10	.81	.42
RESEMP						.22	2.02	.05
RESSPIR						-.09	-.96	.34
RESMAT						.02	.24	.81
RESNEG						.27	2.20	.03
Social Variables	2,87	.22	.005	.28	.76			
SPS						.04	.31	.76
INSUP						-.06	-.69	.49
Biosocial Variable	1,86	.21	.001	.08	.78			
GENDER						.03	.27	.78
Biomedical Variable	1,85	.21	.002	.28	.59			
GHP-5						-.06	-.53	.59
N=96								

Table 7
Hierarchical Blockwise Multiple Regression Analysis with Biopsychosocial Variables as Predictors and Job Satisfaction Two Weeks before 9/11 as Criterion

SOURCE	Df	adjR ²	?R ²	FCh	SigFCh	B	T	Sig
Step 1								
Psychological Variables	6,89	-.02	.05	.75	.61			
CES-D						.13	1.20	.24
LOT						.08	.57	.57
RESEMP						.09	.72	.48
RESSPIR						-.02	-.15	.88
RESMAT						-.02	-.16	.88
RESNEG						.08	.57	.57
Social Variables	2,87	-.03	.01	.49	.61			
SPS						.05	.31	.76
INSUP						.10	.93	.35
Biosocial Variable	1,86	-.03	.01	.99	.32			
GENDER						-.11	-.99	.32
Biomedical Variable	1,85	.03	.06	5.70	.02			
GHP-5						.28	2.40	.02
N=96								

Table 8
Hierarchical Blockwise Multiple Regression Analysis with Biopsychosocial Variables as Predictors and Job Satisfaction Two weeks after 9/11 as Criterion

SOURCE	Df	adjR ²	?R ²	FCh	SigFCh	B	T	Sig
Step 1								
Psychological Variables	6,89	.02	.08	1.25	.29			
CES-D						.001	.006	.99
LOT						.003	.02	.98
RESEMP						.14	1.18	.24
RESSPIR						-.08	-.79	.43
RESMAT						.02	.19	.85
RESNEG						.17	1.19	.24
Social Variables	2,87	.02	.03	1.29	.28			
SPS						-.01	-.09	.93
INSUP						.17	1.61	.11
Biosocial Variable	1,86	.01	.001	.08	.78			
GENDER						-.03	-.28	.78
Biomedical Variable	1,85	.00	.00	.01	.91			
GHP-5						.01	.12	.91
N=96								

Table 9
Hierarchical Blockwise Multiple Regression Analysis with Biopsychosocial Variables as Predictors and Job Satisfaction One Year after 9/11 as Criterion

SOURCE	Df	adjR ²	?R ²	FCh	SigFCh	B	T	Sig
Step 1								
Psychological Variables	6,89	.05	.11	1.80	.108			
CES-D						.003	.03	.98
LOT						.20	1.53	.13
RESEMP						.04	.33	.74
RESSPIR						-.16	-1.54	.13
RESMAT						-.01	-.08	.94
RESNEG						.12	.79	.40
Social Variables	2,87	.06	.03	1.65	.20			
SPS						-.09	-.62	.54
INSUP						.174	1.73	.09
Biosocial Variable	1,86	.05	.002	.23	.64			
GENDER						-.05	-.48	.64
Biomedical Variable	1,85	.06	.02	1.83	.18			
GHP-5						-.16	-1.35	.18
N=96								

Hypothesis 13a: Psychological factors will significantly contribute to the variance in subjective well-being.

To test this hypothesis, as indicated by the implied order of the biopsychosocial model (Hoffman & Driscoll, 2000), psychological factors (depression, four resiliency scales, and optimism) were entered as a block in the first step of the regression equation carried out on the dependent variable, subjective well-being. Social factors (social support and institutional support) were entered in the second step, a biosocial factor (gender) was entered in the third step and a biomedical factor (general health perceptions) was entered in the fourth step. The results of the regression analysis, found on Tables 4, 5, and 6, indicate that psychological factors were significant predictors of SWB before the terrorist event, $F(9,89)=3.43$, $p=.004$, accounting for 13.3% of the variance in SWB.

As indicated by the beta weights, none of the factors made an independently significant contribution to this equation. Psychological variables also predicted a significant amount of variance in SWB two weeks after 9/11, $F(9, 89) = 5.54$, $p=.000$, accounting for 22.3% of the variance. However, none of the factors made an independently significant contribution to this equation. Psychological variables were also significant predictors in SWB one year after the terrorist event, $F(9, 89) = 5.79$, $p=.000$, accounting for 23.2% of the variance in SWB. Again, none of the factors made an independently significant contribution to this equation.

Hypothesis 13b: Psychological factors will significantly contribute to the variance in job satisfaction.

In this regression, psychological factors (depression, four resiliency scales, and optimism) were entered as a block in the first step of the regression equation carried out

on the dependent variable, job satisfaction. Social factors (social support and institutional support) were entered in the second step, a biosocial factor (gender) was entered in the third step and a biomedical factor (general health perceptions) was entered in the fourth step. The results, found in Tables 7, 8, and 9, indicate that psychological variables did not significantly predict job satisfaction before 9/11, two weeks after, or one year after the terrorist attacks.

Hypothesis 13c: Psychological factors will significantly contribute to the variance in impact of event.

To test this hypothesis, psychological factors (depression, four resiliency scales, and optimism) were entered as a block in the first step of the regression equation carried out on the dependent variable, impact of event. Social factors (social support and institutional support) were entered in the second step, a biosocial factor (gender) was entered in the third step and a biomedical factor (general health perceptions) was entered in the fourth step. The results, found in Tables 10 and 11, indicate that psychological variables did not significantly predict impact of event two weeks after 9/11. However, psychological variables were significant predictors of impact of event one year after the terrorist attacks, $F(6, 89) = 3.01, p = .01$, accounting for 11.3% of the variance in impact of event. When all predictors were entered in the regression, the beta weights indicated no independent predictors.

Hypothesis 14: Social factors will explain a significant amount of variance in overall adjustment.

Hypothesis 14a: Social factors will explain a significant amount of variance in subjective well-being.

Table 10
Hierarchical Blockwise Multiple Regression Analysis with Biopsychosocial Variables as Predictors and IES Two weeks after 9/11 as Criterion

SOURCE	Df	adjR ²	?R ²	FCh	SigFCh	B	T	Sig
Step 1								
Psychological Variables	6,89	.07	.13	2.11	.06			
CES-D						-.19	-1.81	.07
LOT						-.24	-1.88	.06
RESEMP						-.02	-.14	.89
RESSPIR						.09	.86	.39
RESMAT						.08	.74	.46
RESNEG						-.11	-.84	.41
Social Variables	2,87	.06	.01	.64	.53			
SPS						-.04	-.29	.77
INSUP						.11	1.11	.27
Biosocial Variable	1,86	.05	.00	.04	.84			
GENDER						-.02	-.20	.84
Biomedical Variable	1,85	.08	.04	3.96	.05			
GHP-5						.23	1.99	.05
N=96								

Table 11
Hierarchical Blockwise Multiple Regression Analysis with Biopsychosocial Variables as Predictors and IES One Year after 9/11 as Criterion

SOURCE	Df	adjR ²	?R ²	FCh	SigFCh	B	T	Sig
Step 1								
Psychological Variables	6,89	.11	.17	3.01	.01			
CES-D						.13	1.34	.18
LOT						-.26	-2.07	.04
RESEMP						-.05	-.46	.65
RESSPIR						-.12	-1.17	.24
RESMAT						.24	2.38	.02
RESNEG						-.04	-.29	.77
Social Variables	2,87	.13	.03	1.79	.17			
SPS						-.24	-1.82	.07
INSUP						.06	.62	.54
Biosocial Variable	1,86	.13	.01	1.05	.31			
GENDER						-.10	-1.03	.31
Biomedical Variable	1,85	.23	.10	12.34	.001			
GHP-5						.37	3.52	.001
N=96								

In this hierarchical multiple regression, conducted on the dependent variable subjective well-being, psychological factors (depression, four resiliency scales, and optimism) were entered as a block in the first step of the regression equation carried out on the dependent variable, subjective well-being. Social factors (social support and institutional support) were entered in the second step, a biosocial factor (gender) was entered in the third step and a biomedical factor (general health perceptions) was entered in the fourth step. The results of the regression analysis, found on Tables 4, 5, and 6 , indicate that social factors did not predict a significant amount of the variance in subjective well-being at any point before or after 9/11.

Hypothesis 14b: Social factors will explain a significant amount of variance in job satisfaction.

In this hierarchical multiple regression, conducted on the dependent variable, job satisfaction, psychological factors (depression, four resiliency scales, and optimism) were entered as a block in the first step of the regression equation carried out on the dependent variable, subjective well-being. Social factors (social support and institutional support) were entered in the second step, a biosocial factor (gender) was entered in the third step and a biomedical factor (general health perceptions) was entered in the fourth step. The results of the regression analysis, found on Tables 7,8, and 9, indicate that social factors did not predict a significant amount of the variance in job satisfaction at any point before or after September 11.

Hypothesis 14c: Social factors will explain a significant amount of variance in impact of event.

In this hierarchical multiple regression, conducted on the dependent variable impact of event, psychological factors (depression, four resiliency scales, and optimism) were entered as a block in the first step of the regression equation carried out on the dependent variable, subjective well-being. Social factors (social support and institutional support) were entered in the second step, a biosocial factor (gender) was entered in the third step and a biomedical factor (general health perceptions) was entered in the fourth step. The results of the regression analysis, found on Tables 10 and 11, indicate that social factors did not predict a significant amount of the variance in impact of event at any point before or after the terrorist event.

Hypothesis 15: Biosocial factors will explain a significant amount of variance in overall adjustment.

Hypothesis 15a: Biosocial factors will explain a significant amount of variance in subjective well-being.

In this hierarchical multiple regression, conducted on the dependent variable subjective well-being, psychological factors (depression, four resiliency scales, and optimism) were entered as a block in the first step of the regression equation carried out on the dependent variable, subjective well-being. Social factors (social support and institutional support) were entered in the second step, a biosocial factor (gender) was entered in the third step and a biomedical factor (general health perceptions) was entered in the fourth step. The results of the regression analysis, found on Tables 4, 5, and 6 , indicate that biosocial factors did not predict a significant amount of the variance in subjective well-being at any point before or after 9/11.

Hypothesis 15b: Biosocial factors will explain a significant amount of variance in job satisfaction.

In this hierarchical multiple regression, conducted on the dependent variable job satisfaction, psychological factors (depression, four resiliency scales, and optimism) were entered as a block in the first step of the regression equation carried out on the dependent variable, subjective well-being. Social factors (social support and institutional support) were entered in the second step, a biosocial factor (gender) was entered in the third step and a biomedical factor (general health perceptions) was entered in the fourth step. The results of the regression analysis, found on Tables 7,8, and 9, indicate that biosocial factors did not predict a significant amount of the variance in job satisfaction at any point before or after September 11.

Hypothesis 15c: Biosocial factors will explain a significant amount of variance in impact of event.

In this hierarchical multiple regression, conducted on the dependent variable impact of event, psychological factors (depression, four resiliency scales, and optimism) were entered as a block in the first step of the regression equation carried out on the dependent variable, subjective well-being. Social factors (social support and institutional support) were entered in the second step, a biosocial factor (gender) was entered in the third step and a biomedical factor (general health perceptions) was entered in the fourth step. The results of the regression analysis, found on Tables 10 and 11, indicate that biosocial factors did not predict a significant amount of the variance in impact of event at any point before or after the terrorist event.

Summary of findings

The biomedical factor only predicted a significant amount of variance in impact of event one year after 9/11/01, accounting for an additional 10.1% of the variance beyond that associated with the other variables. The biomedical factor did not predict impact of event right after the World Trade Center attacks, job satisfaction, or subjective well-being.

Psychological factors were significant predictors in SWB before the terrorist event, accounting for 13.3% of the variance in SWB. They also predicted a significant amount of variance in SWB two weeks after 9/11, accounting for 22.3% of the variance, and one year after the terrorist event, accounting for 23.2% of the variance in SWB. Additionally, psychological variables were significant predictors of impact of event one year after the terrorist attacks, accounting for 11.3% of the variance in impact of event, although they did not predict IES right after 9/11 nor did they predict job satisfaction.

Social factors and biosocial factors did not predict a significant amount of variance in subjective well-being, job satisfaction, or impact of event.

Additional Questions

In addition to the above-mentioned hypotheses, several exploratory research questions were explored in the present study.

4. What is the relationship between race/ethnicity and subjective well-being, job satisfaction, and impact of event?

Correlational analyses indicated no significant relationships between race/ethnicity and subjective well-being, job satisfaction, and impact of event.

5. What is the relationship between gender and subjective well-being and job satisfaction?

Correlational analyses indicated no significant relationships between gender and subjective well-being and job satisfaction.

6. Is there a gender difference in the types of coping (i.e., problem focused vs. emotion focused) selected when appraised controllability is controlled?

This question was unable to be examined due to the low alpha coefficient for appraised controllability. Additionally, the coping factor was unable to be used due to an uninterpretable factor structure.

Additional Analyses

A hierarchical cluster analysis was used to identify distinct patterns of change in subjective well-being in subgroups of participants. Cluster analysis provides an appropriate data reduction technique that reveals "homogeneous subtypes within a complex data set" (Borgen & Barnett, 1987 p. 460). Cluster analysis has been suggested as an appropriate technique to "identify groups of people who, on a single variable, change in different ways over occasions" (Borgen & Barnett, p. 459). Therefore, it was deemed as a good way to examine groups of people within this sample whose reported subjective wellbeing changed over time. Hierarchical clustering methods are the most widely used type of cluster analysis (Borgen & Barnett). Ward's linkage method (Ward, 1963) was used in this investigation. This method of analysis has been widely used and has been found to adequately minimize the variance within clusters at each stage of grouping. Recent comparative studies indicate that Ward's method is one of the more effective methods for recovering underlying structure of multivariate data (Borgen &

Barnett). Missing data was filled in using mean replacement. The data was standardized so that no time period would carry more weight than another.

Cluster analysis

The Ward method of cluster analysis was used to categorize the members of the sample using the subjective well-being variable. Each of the 96 participants was initially regarded as a separate cluster. Iterative steps were conducted by initially grouping together the two most similar individuals into a cluster. Progressive steps continued to group the two most similar individuals or clusters until in the final step; all individuals were in a cluster. Clusters of 4 sub-groups and 5 sub-groups were compared. The number of clusters retained was determined by examining the dendogram, by considering the size of the groups and by examining the conceptual clarity of the sub-groups. The four sub-grouping cluster was retained over the 5 because the groups in the 5 cluster were very small and the 4 cluster seemed conceptually clearer. A repeated measures ANOVA was performed for descriptive purposes to determine whether or not the 4 clusters differed statistically. There was a significant overall difference in the four groups, Pillai's trace = .52, $F(6, 184) = 13.38, p < .01$. Additionally, cluster membership accounted for 26% of the variance in patterns of change in SWB over time.

Overall, there was no quadratic effect, but there was an overall linear difference $F(3, 92) = 32.10, p < .001$. Table 12 contains the means and standard deviations for the subjective well-being scores for the four clusters across three points in time (right before 9/11, two weeks after 9/11, and 1 year after 9/11).

Table 12
Means and Standard Deviations for the SWB Scores for Four Clusters across Three Points in Time (right before 9/11, two weeks after 9/11, and 1 year after 9/11)

Ward Method	Mean	Standard Deviation	N
SMEAN (SWB_B) 1	.35	1.16	58
2	-.67	1.21	16
3	2.28	1.04	12
4	-3.71	2.06	10
Total	-.00024	1.96	96
SMEAN (SWB_A) 1	.34	.80	58
2	-2.07	1.21	16
3	2.87	.92	12
4	-1.73	1.89	10
Total	.0040	1.79	96
SMEAN (SWB_N) 1	.26	.87	58
2	-2.79	1.78	16
3	2.57	.98	12
4	-.55	1.53	10
Total	.0045	1.87	96

As indicated in Figure 1 each of the four clusters exhibited a unique pattern of scores in subjective well-being. Specifically, Cluster 1 ($n=58$) demonstrated relatively no change over time, Cluster 2 ($n=16$) demonstrated a negative linear pattern, Cluster 3 ($n=12$) demonstrated a quadratic pattern of low, high, low, and Cluster 4 ($n=10$) demonstrated a positive linear pattern.

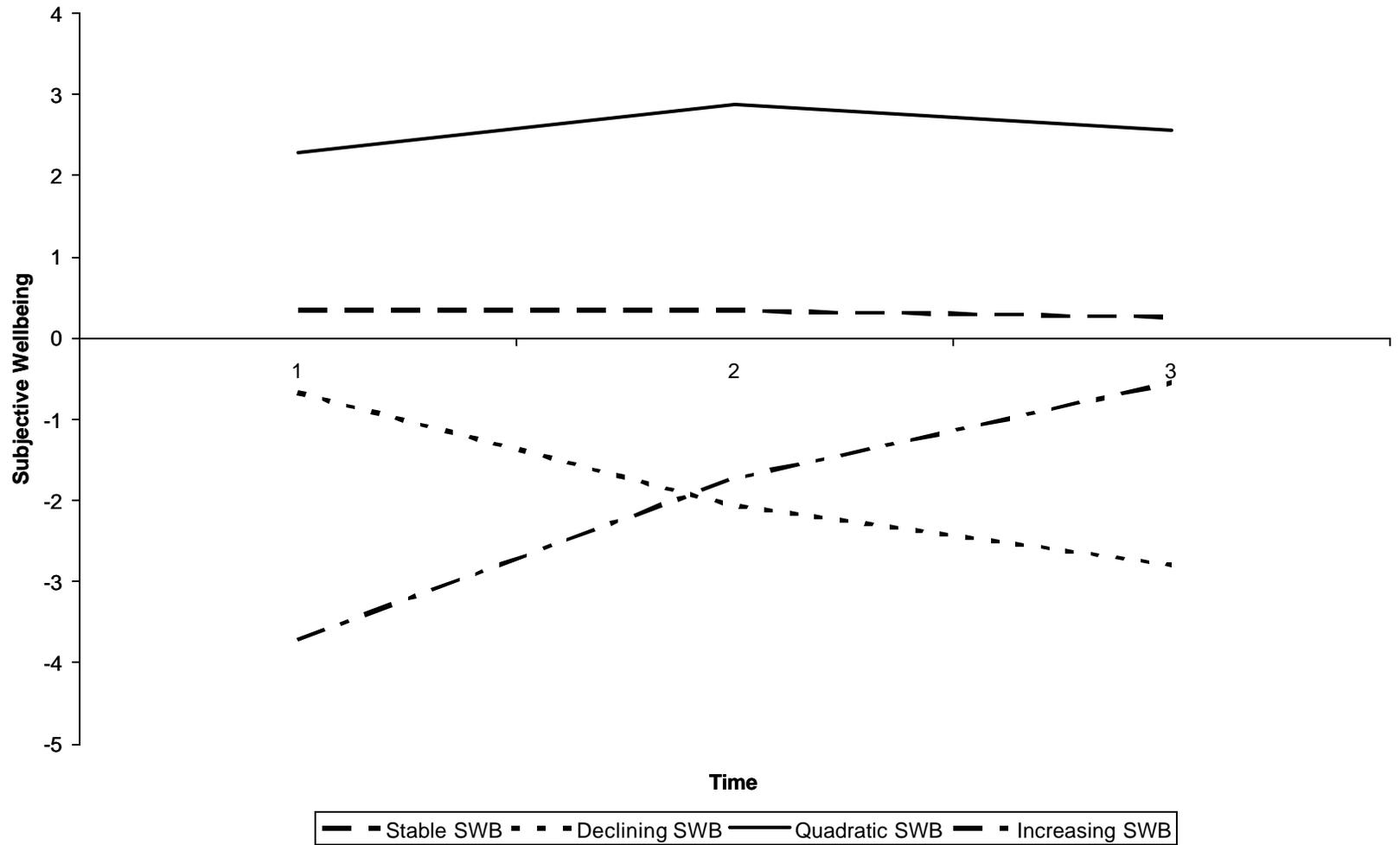
Multivariate analysis of variance (MANOVA) was used to assess the presence of a confounding demographic effect upon cluster membership. No significant demographic effect was found.

To further examine these observed patterns of change in subjective well-being (SWB), a series of repeated measures analyses of variance (ANOVAs) were conducted to test the significance of these temporal changes in SWB ratings. Each repeated measures ANOVA performed separately for each cluster was followed up with a trend analysis testing for linear or quadratic trends.

For Cluster 1, the repeated measures ANOVA was not significant. Therefore, for Cluster 1, no linear or quadratic trend was found. A significant linear trend was found for Cluster 2, $F(1, 15) = 35.16, p < .01$. A significant quadratic trend was found for Cluster 3, $F(1, 11) = 10.44, p < .01$. A significant linear trend was found for Cluster 4, $F(1, 9) = 26.55, p < .01$.

The participants in Cluster 1 ($n = 58$) reported a relatively moderate level of SWB before September 11, and it stayed moderate two weeks after September 11 and throughout the following year. In fact, there was no significant change in SWB for this group of participants. I labeled this group of participants the *stable SWB* cluster.

Fig 1. Subject Well-being Clusters



The participants in Cluster 2 ($n = 16$) reported a relatively moderate initial level of SWB right before September 11, followed by a decline in SWB two weeks post 9/11 and a further decline one year after the event. The repeated measures ANOVA for this group of clients showed a significant negative linear effect. I labeled this group of clients the *declining SWB* cluster.

The participants in Cluster 3 ($n = 12$) reported the highest initial level of SWB followed by an increase in SWB two weeks later. One year later, reported SWB levels had decreased from two weeks after 9/11. The repeated measures ANOVA for this group of participants showed a significant quadratic trend, indicating significant differences between time 1 and 2 and time 2 and 3. A T-test was performed to determine if there was a significant difference between the beginning level of SWB and the final level of SWB measured for this group. No significant difference was found, indicating that the Cluster 3 participants' reported SWB returned close to pre- 9/11 baseline one year after September 11. This participant group was labeled the *quadratic SWB* cluster.

The participants in Cluster 4 ($n = 10$) reported a relatively low initial level of SWB right before September 11, followed by an increase in SWB two weeks post 9/11 and an additional increase one year after the event. The repeated measures ANOVA for this group of clients showed a significant positive linear effect. I labeled this group of clients the *increasing SWB* cluster.

Next, a series of MANOVA's were conducted to identify variables that distinguished cluster membership. Variables were divided into four groupings consistent with the biopsychosocial model. The first grouping, which represents the biological component of the model, included general health perceptions and reported depression.

The next grouping reflects the social aspect of the biopsychosocial model and includes measures of aspects of social support. The final groupings include psychological variables. Specifically, the third grouping contains impact of events at two points in time, and the fourth grouping resiliency variables.

The MANOVA for the first grouping and cluster membership indicated that general health perceptions and depression do not have a significant distinguishing effect on group membership. The MANOVA for the social support variable is uninterpretable because the assumptions for equality of covariance and equality of error variance were not met. The MANOVA for the third grouping indicated that impact of events also did not significantly distinguish group membership.

The MANOVA for the fourth grouping did indicate that resiliency had an overall effect on group membership, Pillai's Trace = .35, $F(15,270) = 2.39$, $p < .01$. The fourth grouping included four factors of a resiliency scale and a measure of optimism. The four resiliency factors included meaningfulness/determination, spiritual support, mattering, and negativity/helplessness. Independently, mattering and spirituality did not have a significant impact on group membership. However, the resiliency factor of meaningfulness/determination, $F(3, 95) = 4.09$, $p < .01$, the resiliency factor of negativity/helplessness, $F(3, 95) = 8.55$, $p < .01$, and optimism $F(3, 95) = 8.73$, $p < .01$ all had significant individual effects on group membership.

Follow-up multiple comparisons of all means indicate that members of groups 2 and 3 had different levels of perceived meaningfulness/determination (mean difference -.44, S. E. .13, $p < .01$). Groups 1 and 2 (mean difference -.37, S. E. .11, $p < .01$), 2 and 3 (mean difference -.71, S. E. .15, $p < .01$), and 3 and 4 (mean difference -.61, S. E. .17,

$p < .01$) all reported significantly different levels of perceived helplessness. Finally, groups 1 and 4, 2 and 3, and 3 and 4 also reported significantly different levels of optimism.

In summary, members of the Stable SWB group (group 1) and the Declining SWB group (group 2) perceived that they were lower on the determination/meaningfulness subscale than members of the Quadratic SWB group (group 3). Members of the Quadratic SWB group reported less perceived helplessness than members of the Declining SWB group and members of the Increasing SWB group (group 4). Members of the Stable SWB group indicated that they had less perceived helplessness than members of the Declining SWB group. Members of the Quadratic SWB group also reported more optimism than members of the Declining SWB group and members of the Increasing SWB group. Additionally, members of the Stable SWB group reported more optimism than members of the Increasing SWB group.

Qualitative analysis

Participants of the study were asked to report any positive events that occurred on or as a result of their 9/11 experience. Seventy-two participants reported a positive event while 24 did not report a positive event. Chi square analysis revealed no relationship between cluster membership and reporting of positive event.

In order to examine types of positive responses, a categorizing system was created based on themes that emerged from the positive events. The first category is “connecting to others”, which included responses that indicated that the participant had either made new relationships, deepened existing relationships, or reconnected to people with whom he or she may have lost touch. “Meaning” is the second category, and it includes positive

events that seemed to create or enhance a person's sense of meaning in life, themselves, or others. The third and final category, "helping others" consists of responses about either witnessing or providing help to other people on the day of September 11, 2001 or choosing to volunteer as a response to the 9/11 attacks. Chi square analysis reveals no relationship between cluster membership and type of positive event. In this sample, 31 people reported a positive event that involved connecting to others, 14 people reported a positive event that involved creating meaning from the event, and 29 people reported a positive event about helping others.

Chapter 6

Discussion

Primary Analyses

The purpose of this study was to examine how members of a national professional association who were present in the Twin Towers of the World Trade Center in New York City on September 11 have reacted and have adjusted to this traumatic event. This study offers a rare opportunity to expand current knowledge about trauma to include examining how people respond to a catastrophic terrorist attack. This discussion section seeks first to identify the biopsychosocial factors that were related to or predictive of subjective well-being, job satisfaction, and impact of events. Second, the patterns of change in subjective well-being will be discussed and potential contributing factors will be identified. Third, limitations of the current study will be addressed. Finally, implications for practice and future research will be reviewed.

Biopsychosocial factors related to Subjective Well-being

Psychological factors. Subjective well-being was correlated to and predicted by some of the hypothesized variables; however, there were many expected relationships and predictions that remained unsupported by the data. For example, surprisingly there was no relationship found between depression and SWB, even though the mean level of reported depression for this sample was almost one standard deviation above the cutoff determined by Radoff (1977), indicating that the sample is reporting clinically significant depressive symptoms, according to CES-D guidelines. While this null finding is puzzling, it is possible that the baseline depression score for this sample is generally above the norm. As subjective well-being is a measure of satisfaction with life and

positive and negative affect, and as it is unique to each person, it is possible that members of this sample were subjectively satisfied with their lives despite the potential presence of depressive symptoms. If this were true, it may be that the post 9/11 CES-D scores are not reflective of an impact from the traumatic event, but rather a general reflection of the baseline for this group. Even so, the absence of significant relationships between depression and hypothesized outcome measures is perplexing and counter to previous findings.

As expected, resiliency was correlated with SWB before, two weeks after, and one year after 9/11/01, indicating that people in this sample who perceived themselves as more resilient also reported higher levels of SWB or seemed to be happier and have a higher quality of life. While the literature specifically addresses the relationship of trauma to resiliency (King et al., 1998), this study establishes a direct relationship between resiliency and SWB. Since resiliency refers to an ability to deal with adversity or protect against adversity (Edari & McManus, 1998; Schissel, 1993; Rutter, 1987), it should then follow that reported happiness or a good quality of life (higher SWB) is one of the areas that is related to a strong sense of resiliency.

In addition to the overall resiliency measure, specific subscales from the resiliency measure were also positively correlated to SWB. Because the resiliency measure used in the study is still in the development stage, both over all scores and subscale scores were examined. The meaningfulness/determination subscale of the resiliency scale had a small to medium relationship both two weeks after and one year after the traumatic event. This suggests that people who see themselves as survivors or as able to gain strength and meaning from negative experiences were also the people who

tended to report better adjustment (as measured by SWB) or satisfaction with their lives, whereas people with less of a belief that they can effectively deal with stress or tragedy reported lower levels of SWB. Additionally, the negativity/helplessness subscale had a solid, moderate, negative relationship with SWB. This indicates that people who have a more passive or helpless approach or negative belief about their ability to handle difficulty in life also report that they experience lower levels of SWB. Therefore, generally people who do not believe in their ability to deal with stress would seem to have a more difficult time adjusting to a stressful event and would be less satisfied with their lives than their counterparts who feel that they are empowered to deal with stressful or traumatic events.

Optimism was also related to SWB. The research clearly demonstrates that optimism is predictive of positive outcomes (Carver et al., 1993; Brissette, Schreier, and Carver, 2002). The positive significant relationships found between optimism and SWB at three points in time are consistent with similar findings for optimism already established in the literature (Diener, et al., 1999; Okun & Stock, 1987; Robbins & Kliewer, 2000). Therefore, the findings from this study both support previous findings about optimism and SWB, as well as expand what is known about optimism to include a new population of people who have experienced the specific trauma of a civilian terrorist attack.

The findings that these psychological variables are predictive of positive outcomes such as higher levels of SWB at all points in time are consistent with extant literature. Also, recent studies on the same traumatic event provide similar evidence that variables related to positive personality characteristics such as resiliency have had an

effect on positive adjustment after September 11 (Fredrickson et al., 2003; Peterson & Seligman, 2003). This study expands the literature to reflect the collective effect of these three variables on predicting subjective well-being. It is also interesting to note that this block of variables accounted for almost twice the amount of variance in SWB after 9/11 than before the event. This may suggest that psychological variables such as optimism and resiliency become more important when trying to deal with a stressful or traumatic event.

Social variables. Social support has been demonstrated to be related to decreased incidence of PTSD and other psychological symptomatology in trauma victims (Benight et al, 2000; Brewin et al, 2000; Gidron, 2002; King et al., 1998; Nixon et al., 1999; Ofman et al., 1995; Solomon et al., 1988; Tucker et al., 1997) and has consistently been shown to contribute to positive adjustment and personal development in general (Sarason, Levine, Basham, & Sarason, 1983). For this sample, however, social support was not related to subjective well-being.

One aspect of this sample that differentiates it from others who experienced the World Trade Center disaster is that most of these participants did not live in New York City. This is important because, unlike New Yorkers who bonded together in support of one another, this group went back to their respective homes in different locations all over the country. The mean score for social support for this sample was average (Russell & Cutrona, 1987), but perhaps the support they got was not specific to this event and therefore was uncorrelated to adjustment factors in this study. Additionally, social support may be a buffering effect in that it is more crucial when someone is distressed.

As social support data were gathered one year after the event, perhaps it did not have a significant relationship to the outcome measures due to the timing of the data collection.

Another possibility for the lack of relationship with social support may be the fact that this sample was largely male. Previous research has suggested that men may be less affected by the support of others. For example, in a study of the ameliorating effects of social support on occupational stress, Beehr, Farmer, Glazer, Gudanowski, and Nair (2003) found that people who tend to be more feminine have stronger reactions to social support than people who tend to be more masculine. In another study looking at gender differences in the perception of stress and utilization of social support, Day and Livingstone (2003) also found that women were more likely to utilize social support to deal with stress than men. This information about gender differences in social support is consistent with the lack of findings for social support in the current study.

While institutional support has been found to bolster adjustment during stressful events (Hoffman, 1996), it does not appear to be a significant factor in adjustment for this sample. The mean reported level of institutional support for this group was relatively low (within the range of scores), so the fact that they generally did not report much institutional support may be why it had no relationship to subjective well-being. Again, due to the nature of this sample being from different areas of the country and because the trauma did not occur in their home community, it is likely that they did not have access to support systems that New York residents may have had. Therefore, lack of accessibility could explain lack of impact.

Biomedical variables. Subjective well-being was also not related to health perceptions. One reason that there were so few significant findings between health

perceptions and the outcome measures could be related to the relatively high mean score for this group on the health measure ($M=20.7$, $SD=3.13$). This mean score suggests that this sample had positive health perceptions. It is possible that when in good health, less attention is paid to health status, and therefore, physical health or indices of physical health have a less noticeable effect on psychological health. However, poor health may have a greater impact on variables of psychological health like SWB, impact of event, and job satisfaction. Furthermore, the literature suggests that the effects of trauma on physical health are often long term or chronic (King et al., 1998; Martin et al., 2002; Stein & Barrett-Connor, 2000). Therefore, it may be that any health problems related to this trauma may not be noticed for some time and may not have had enough time to make a significant impact on psychological health.

Biopsychosocial factors related to Job Satisfaction

In general, job satisfaction was related to or predicted by only two of the hypothesized variables (general health perceptions were related to job satisfaction before 9/11; optimism was related to job satisfaction at one year after the event). Originally, job satisfaction was thought to be important for this sample of individuals since their exposure to the event was job-related in that they were attending a professional conference when the terrorist attacks occurred. Therefore, the absence of findings regarding job satisfaction is perplexing.

There is no available research to indicate the role of a traumatic event on job satisfaction, so it is difficult to compare the lack of findings with this sample to any other group. However, the findings are mixed with regard to the role of dispositional factors such as negative affect on job satisfaction. For example, in one study of the effect of

impact of negative affectivity on job satisfaction, Decker and Borgen (1993) reported that negative affectivity had some effect impact on job strain but little effect on job satisfaction. However, in a similar study by Levin and Stokes (1989), they found that negative affectivity was indeed a predictor of job satisfaction. This suggests that the stability of job satisfaction is unclear as are potential non-work related factors that may affect it. For this reason, the lack of findings for job satisfaction may simply be due to stability in job satisfaction (which is supported by no changes in the means of job satisfaction across the three points in time) for this sample. If job satisfaction is such a stable characteristic in this group of people, it would follow that other variables may have little effect on job satisfaction. It is also possible that for this sample, job satisfaction is largely based on other factors not examined in this study (e.g., pay, work environment, job tasks).

Additionally, because this sample's perception of job satisfaction seems to be relatively unaffected by this traumatic event or characteristics such as resiliency that often protect against trauma or stress, it is possible that the individuals in this sample took refuge in their jobs as a static fixture in their lives that was separate from their experiences in New York City on 9/11/01. This may especially be true for the participants in this sample because they did not work in New York and were able to return to jobs that were minimally affected by the downturn in the economy, disruption in commutes or workplace, or loss of colleagues. This work experience may be very different than that of people who directly experienced the events in NYC but had to remain in that area to live and work. In this way, work could have served as a buffering factor against the trauma rather than an area that was deeply affected by it.

In terms of the partially supported hypotheses, the small relationship between health perceptions and job satisfaction before 9/11 may suggest that prior to the psychological distress of 9/11, health perceptions were a slightly more important correlate to job satisfaction. After 9/11, the immediate psychological effect of the traumatic event may have overshadowed previous health concerns and reduced the importance of health concerns on job satisfaction in this sample.

Because there was little variability in mean scores of job satisfaction at the three points in time measured, it is interesting that optimism was only related to job satisfaction at one year after the event. Perhaps for this group, then, only after time for adjustment and grief had passed was positive attitude related to work satisfaction. Alternatively, as was already suggested, it may be that for this sample job satisfaction is largely based on other factors not examined in this study (e.g., pay, work environment, job tasks). If this were true, it may explain the lack of findings regarding a relation between job satisfaction and optimism before and right after 9/11.

Biopsychosocial factors related to Impact of events

Interestingly, only three of fifteen hypotheses related to impact of events were supported in this study (relation to optimism and biomedical and psychological variables predicted at 1 year after 9/11). The lack of support for the hypotheses involving the trauma measure for impact of events is certainly surprising. The mean score for the sample was consistent with a separate sample of individuals from a stress clinic (Horowitz et al. 1979), indicating that this sample likely had an elevated level of impact of events. For this reason, it is difficult to ascertain why this construct did not relate to

more of the hypothesized variables. However, there may be some potential reasons for the null findings.

Because the block of general psychological variables or biomedical variables did not predict IES two weeks after 9/11, but did predict IES one year later, the role of time with this construct must be considered. For example, the lack of findings for prediction of impact of event two weeks after 9/11 may be due to the amount of time that generally passes before the real impact of a trauma manifests itself. Additionally, people may have had similar experiences and reports of those experiences right after the event as all who were there likely felt highly stressed. After some time had passed, it may be easier to differentiate people who demonstrate PTSD or post-traumatic symptoms as it is after a few months that individual characteristics begin to differentiate the effects of trauma (Henig, 2004). Much of the literature looks at long term effects of trauma (Martin et al., 2002; Stein & Barrett-Connor, 2000; Holen, 1991; King et al., 1998; & Kessler et al., 1995). Therefore, in the short-term people may still be dealing with the shock of what has happened and have not yet begun to integrate the traumatic event. In terms of physical health, the literature also specifically suggests that the effects of trauma on physical health are often long term or chronic (King et al., 1998; Martin et al., 2002; Stein & Barrett-Connor, 2000). Therefore, it may be that any health problems related to this trauma may not be noticed for some time and may not have had enough time to make a significant impact on psychological health.

Because of previous research indicating that women were more at risk for psychological and physical sequelae from trauma (e.g., Breslau, 2001; De Marco, 2000), a gender difference in trauma reactions was expected. However, no difference was

indicated. As previously mentioned, one reason why gender as a biosocial factor was not predictive of overall adjustment may be attributed to the fact that the majority of the sample was male (74%). The small number of women in this sample may have made it difficult to determine significant differences. Also, it is possible that the experience was equally traumatic in this circumstance for both males and females.

The lack of findings of a relation between impact of events and resiliency is also puzzling given that people with higher levels of resiliency were expected to be less affected by this event. It is possible, however, the important aspect of resiliency may not be related to the degree of impact of an event but rather to the overall adjustment. It may be that resiliency is indirectly related to trauma through indices of adjustment through the evidence of adjustment (such as high SWB scores) and not through the extent to which the person reported that he or she felt that the event intruded on their lives. In other words, resiliency may have less to do with the level of intrusion but more to do with how they handled that impact and recovered or protected against it.

Although, the expected relation to resiliency was not supported, the expected relation of impact of events to optimism was statistically supported. Previous research clearly demonstrates that optimism is associated with positive outcomes in general (Carver et al., 1993; Brissette, Schreier, and Carver, 2002), but no studies examining optimism and trauma could be identified. Therefore, the findings of this study regarding the significant negative relations between optimism and IES both right after and one year after 9/11/01 may be findings that contribute new information to both the trauma and optimism literature. It is interesting to consider why optimism was related to impact of events when resiliency was not. It is possible that optimism or positive thinking may be

related to a protective mechanism like denial in which people tend to look at the positive and not fully integrate the negative aspects of their experiences. Because one aspect of resiliency includes being able to find meaning in difficult experiences and see them as a challenge, this construct may relate more to how people psychologically integrate negative life experiences into their emotional and psychological schemas.

One interesting finding was that the biomedical factor significantly predicted impact of event one year after September 11. The valance of this finding, however, was surprising in that more positive health perceptions were related to more impact of event. This may have occurred because people who are healthier have more psychological energy to worry about trauma. Alternatively, it may be that people with health issues focus on health “symptoms”, which could facilitate avoidance of psychological pain or distress. Those with fewer physical complaints may recognize and experience their distress as psychological.

The Biopsychosocial Model

The biopsychosocial model has traditionally been a theoretical model used to conceptualize general health (Hoffman & Driscoll, 2001), but biopsychosocial factors have also been empirically shown to affect SWB in some areas (Domenici-Lake, 2002). Additionally, upon examining the extant literature on the effects of trauma on individuals, it is clear that the effects from various studies fall into all of the categories from the biopsychosocial model. In this study, the biomedical variable (health perceptions) predicted impact of event one year after 9/11 and psychological variables predicted SWB before, right after, and one year later. However, psychological variables only accounted for variance in IES one year later. Interestingly, social variables and biosocial variables

had no significant effect whatsoever. As previously mentioned, possible reasons for the null findings for social and biosocial variables may be related to the disproportionate number of men and the lack of institutional support utilized by this sample. In this study, only two out of four aspects of the biopsychosocial model were found to be predictive of SWB, only supporting part of the biopsychosocial model. Also, the biopsychosocial model (the biomedical part in particular) might be more important in situations where health can be affected by environmental factors that can be associated with illness or disease (e.g. many in NYC developed respiratory disorders from air quality) as well as by psychological distress. This sample may have experienced psychological distress but may not have had it associated to health effects (e.g., respiratory problems.) directly attributable to their presence in the World Trade Center Marriott on that day.

Additional Analyses

At the time of this study, there was no known research examining differences in patterns of change over time in a positive outcome measure (e.g., subjective well-being) following a major traumatic event. For this reason, it seemed important to try to determine how the participants in this sample changed in their recalled levels of SWB from before the event to two weeks after to one year after. The participants in this sample were found to cluster into four groups. In the first group of 58 people, the participants reported a relatively static, moderate level of SWB at all three points in time with no significant differences between scores over time. The 16 people in the second group reported a moderate initial level of SWB right before September 11, followed by a significant decline in SWB two weeks after 9/11 and a further significant decline one year after the event. In the third group of 12 people, the participants reported the highest

initial level of SWB followed by a significant increase in SWB two weeks later. One year later, reported SWB levels for this group had significantly decreased from two weeks after 9/11, essentially returning to baseline. The final group of 10 participants reported a relatively low initial level of SWB right before September 11, followed by a significant increase in SWB two weeks after 9/11 and an additional significant increase one year after the event.

Group membership was not determined by health perceptions, depression, social support or institutional support. However, resiliency and optimism were found to relate to group membership. Specifically, optimism and the resiliency factors of meaningfulness/determination and negativity/helplessness all had significant individual effects on group membership.

In this study, the quadratic SWB group (group 3) was the most defined or differentiated from the other clusters. For example, members of this group tended to report a stronger sense of determination to deal with 9/11/01, based on the determination/meaningfulness subscale of the resiliency measure, and more desire to find meaning than the stable (group 1) and declining groups (group 2). The quadratic SWB group also reported more optimism than either the declining or increasing group (group 4), and the quadratic group also reported less helplessness or feelings of powerlessness in their belief about their ability to handle 9/11 than either the declining or increasing group. This suggests that the people who had a temporary increase in SWB after 9/11 had a stronger sense of resiliency and optimism than people who's SWB stayed the same, got worse or even had a steady incline after 9/11. Beyond the quadratic group, members of the stable SWB group also reported significantly higher levels of optimism

than the members of the increasing SWB group, although it should be noted that mean SWB scores before 9/11 for the stable group were higher than mean SWB scores before 9/11 for the increasing group. Additionally, members of the stable group also reported less helplessness or negativity on the resiliency subscale than members of the declining group.

Research has consistently demonstrated that a myriad of problems, both physical and psychological often result from trauma exposure (Breslau, 2001; Clum, Nishith, & Resick, 2001; De Marco, 2000; Foa & Street, 2001; King, King, Fairbank, Keane, & Adams, 1998; Martin et al., 2002; Purves & Erwin, 2002; Stein & Barrett-Connor, 2000; Uba & Chung, 2002; Zlotnick, Zimmerman, Wolfsdorf, & Mattia, 2001), clearly supporting the pattern of change in the declining SWB group. Data from this study show that this declining group differs from the other groups in that they reported less of a sense of meaningfulness/determination, more feelings of negativity/helplessness, and less optimism than other groups. While such factors, particularly higher levels of optimism, have been related to positive outcomes in other studies (Brissette, Schreier, & Carver, 2002; Carver et al., 1993; & Scheier et al., 1989), it is difficult to determine what additional variables may have contributed to the decline in this group. Drawing from previous trauma research, one might speculate that this group experienced more anxiety, somatic concerns, physical illness, interpersonal interference and that those or similar factors may have contributed to the negative change in SWB. However, based on the data, it appears that neither depression, physical health perceptions nor impact of event were significant determining factors. Therefore, other than resiliency and optimism, the

variables that differentiate the declining group from the other groups are largely unknown.

In addition to a declining group, it may seem logical that the SWB for some people would not be significantly affected at all by such a traumatic event. In fact, for this sample about 60% of the group reported no significant changes in SWB. The primary differences for this group were that they reported lower levels of the resiliency factor of negativity/helplessness than the declining group and ironically more optimism than the increasing group. However, they also reported lower scores on the resiliency subscale regarding determination and attempt to find meaning in the event than the quadratic group. These differences, particularly in terms of resiliency, may indicate that stronger feelings of negativity or helplessness are associated with a decline in SWB after a traumatic event (as in the declining group). At the same time, a greater sense of determination or desire to seek meaning appears to be associated with an increase in SWB right after a traumatic event (as with the quadratic group), whereas people who do not report either an elevated level of feelings or helplessness or a strong sense of determination and seeking meaning would not experience any change, either decline or growth, as in seen in the stable SWB group.

The most surprising patterns of change in these groups were found in the quadratic group, which had a SWB score that rose after 9/11 and returned to baseline by 1 year after and the increasing group, which had scores that rose during the year after 9/11. Initially these findings seem contradictory to all of the data that presents the pathology that can emerge from trauma exposure, but upon closer examination of the literature, one can also find evidence of how trauma might be beneficial. For example,

Tedeschi and Calhoun (1995) have described the idea of post traumatic growth.

Basically, they suggest that sometimes there can be a process leading to positive changes in an individual's life which occur in response to trauma. Such changes could include, but are not limited to altered perceptions of self, relationships with others, and life in general. Tedeschi and Calhoun suggest that people who are optimistic, flexible and have a creative, extraverted personality may be able to view a situation in a variety of ways as well as engage in cognitive processing of the trauma that can lead to growth following a traumatic event. In line with the idea of Tedeschi and Calhoun's posttraumatic growth concept, some recent research regarding the September 11, 2001 has shown similar positive changes.

One study that examined pre-crisis resiliency, positive emotions and both post-crisis depressive symptoms and post-crisis growth in psychological resources found that more resilient individuals tended to have fewer depressive symptoms after 9/11 and even tended to experience more positive emotions such as gratitude, interest, and love (Fredrickson, Tugade, Waugh, & Larkin, 2003). In fact, Fredrickson et al. reported that the participants were counting their blessings and feeling grateful that they and their loved ones were safe. They were also focusing more on the love they felt for friends and family and experiencing the need to express it. It is important to note, however, that while this study examines the same collective traumatic event, the participants were students at the University of Michigan and were neither directly affected nor present at the site of the terror attacks. Another study that examined character strengths before and after September 11, found that at 2 months after the event, seven personality characteristics (gratitude, hope, kindness, leadership, love, spirituality, and teamwork)

showed increases from before 9/11 (Peterson & Seligman, 2003). At 10 months after the event, the increases were still present although to a lesser degree. Similar to the current study, this study was conducted on the World Wide Web. However, unlike this study, the participants were from all over the world and again, were for the most part, not present in New York City on the morning of 9/11/01.

These studies as well as the idea of posttraumatic growth are consistent with the more positive trends in the quadratic and increasing groups. The findings of the Peterson and Seligman (2003) study are specifically reflective of the trend of the quadratic group, which increased two weeks after 9/11 and returned to baseline at a year. In the Peterson and Seligman study, the authors suggest that an increase in these personality characteristics allowed people to enhance their sense of belonging in ways that may be self-perpetuating. For the current study, the quadratic group differed from other groups in that these individuals reported more of the resiliency factor of meaningfulness/determination, less negativity/helplessness, and more optimism than other groups. If one assumes that optimism and hope are closely related, then these differentiating factors are also consistent with some of the factors found to increase in the Peterson and Seligman study. Additionally, the higher reported resiliency in the quadratic group is also consistent with the beneficial role of resiliency in the Fredrickson study.

One difference between the quadratic and increasing groups was that the SWB of the quadratic group returned to baseline one year after 9/11, whereas, SWB for the increasing group was even higher one year after the traumatic event than two weeks after. The reason for this difference is empirically unknown, but some theoretical explanations

exist. For example, it could be that the baseline SWB score of the quadratic group represents a relatively healthy and happy appraisal of SWB so that even a return to this level is reflective of a strong sense of SWB. On the other hand, the increasing group may have started at a much lower level of SWB and had more “room to grow” per se. In the same way, for some people who experience trauma with a strong baseline SWB, traumatic growth may serve a function of managing the earlier reactions to a stressful or traumatic event but become less necessary as a means of coping with a difficult experience over time. Conversely, for people who begin with a lower sense of SWB, traumatic growth may be more evident over the long term because there is more room for change. Also, it may be that people who started with a higher SWB already have effective coping skills and styles, so their repertoire may not be changed as much, whereas those who start out with lower SWB, may find some effective coping skills or other positive characteristics (e.g., positive reframing) in the process of adjustment that allow them to maintain some part of their growth on a more long term basis.

The findings for the members of the increasing group, like the quadratic group, are consistent with the findings of the aforementioned studies. However, the increasing group had more negativity/helplessness and less optimism than the quadratic group but also had a lower SWB baseline than the quadratic group. So, it is possible that for the increasing SWB group, the 9/11 event had a more long term positive impact, perhaps as mentioned by other authors, by increasing gratitude and appreciation for life and loved ones.

In general, the patterns of change, examined through cluster analysis, found in this study seem to offer a fairly good representation of other research in the general area.

As one might expect about 60% of the participants had a stable SWB, 17% got worse or had a declining SWB, 13% reported a higher SWB right after the traumatic event and then returned to baseline a year later, while 10% had a more positive SWB after 9/11 that was continuing to grow even a year later. While the data did provide some idea as to what factors determined group membership based on SWB, to a large degree the variables that affected the change patterns are unknown since only two variables in this study were related to group membership and many other variables beyond the scope of this study could also have contributed to group membership. However, this study is important because it provides evidence that people, specifically who are directly exposed to a traumatic event, do respond in very different ways. This data suggests that while some people are unaffected or negatively impacted by trauma, many others may have positive outcomes that lead them to a greater appreciation for and more satisfaction with their lives than before the traumatic experience.

The idea that growth or positive outcome can result from a tragedy such as 9/11 is further supported by the fact that 75% of the sample reported some type of positive event resulting from their experiences in New York on September 11, 2001. Interestingly, neither whether or not a positive event was reported nor type of positive event (connecting to others, meaning, or helping others) was related to changes in subjective wellbeing.

The major themes of the positive events consisted of: connecting to others, finding meaning, and helping others. For this sample, it seems as though connecting to others and helping others were the most positive aspects of the terrorist attacks. Many respondents focused on the idea that people came together and supported each other

emotionally (connecting to others) and physically (helping others). These participants cited experiences where they witnessed genuine altruism such as people stopping to help others up as they ran from the falling Towers or NYC residents welcoming strangers into their homes to use the phone, get water or use the restroom. One specific example from the category of helping others from one respondent was: “as I walked for two hours trying to get out of southern Manhattan, a woman on the street offered me water and a bathroom in her apartment. It was a gracious, loving act. I have since lost her name, but I will always remember her.” They also talked about emotionally connecting with those who were with them that day, after having shared such a terrifying experience or just seeing strangers come together to offer support for each other. As an example from connecting to others, one respondent wrote, “I live in NYC and just seeing people coming together from out of nowhere to offer support and love was really great.”

In terms of later positive outcome, some respondents said that they felt called to volunteer their time to help others. As an example from the “helping others” category, a participant said, “After Sept. 11, I chose to give my time to volunteer service instead of finding another job. It has been the best decision I could have made, and is proving to be most rewarding”. Many participants also reported becoming closer to family and friends or making deliberate efforts to reconnect with lost friends or mend broken family ties. One respondent wrote, “I have made more time for close friends and family, to enjoy their company while I can. For example, I flew across the country to celebrate a friend's 50th birthday.” For other respondents, the positive event was gaining meaning through pride in being an American, recognizing that life is fragile and to enjoy it, or realizing

that they are more brave and courageous than they thought. As an example of finding meaning, one participant wrote,

I'm unhappy that it happened, but I am glad I was there when it did. It would have been an abstract, distant event to me otherwise. Instead, the greatest communal experience of our generation feels real to me. I was able to help some people. I did stupid things -- stood around in the way, cried like a lunatic, lashed out at people in anger. But I also refused to be afraid. I'm a small, effeminate man, but I was never a coward. I helped people up who fell. I tried to help my fellow hotel guests escape. I offered first aid to others, and then, I worried about escaping. You can never be sure what you're made of until you're tested. I was tested that day, and I was -- for the most part -- the kind of person I hoped to be. I did okay.

Clearly, the events of 9/11 were tragic and horrifying particularly for those who were in NYC that morning. However, the positive events discussed above speak to the hope that these people were able to find even in such a traumatic event and further support the idea that traumatic growth can occur.

Limitations

This study provides valuable insight into variables that affected adjustment after 9/11/01 and provides evidence of positive growth patterns following this traumatic event. It is also unique in that it examines a large group of people who experienced the same traumatic event at the same time but then dispersed to geographically different locations. While this study has the potential to make useful contributions to both the literature and planning of practical interventions with survivors of major civilian traumas, there are

some inherent limitations to the current study. First, the sample in this study is a non-randomized sample which can produce biases and lead to less generalizable results. For example, participants in this study self-selected themselves to participate, so those with stronger reactions may have been more motivated to respond, which could skew the results and the generalizability to the general population. Second, the sample was relatively homogeneous in that the most respondents were white, middle-aged men with some level of graduate education. Clearly, this is not representative of the general population in terms of gender, ethnicity, age, socioeconomic status or education. Therefore, what we can learn specifically from this study may be limited to a small portion of the American public. Third, it is possible that an additional sampling bias could have occurred since all participants were affiliated with the same organization. Perhaps there were unmeasured characteristics unique to people affiliated with this organization that are different from the general population. To illustrate, there are more men than women in this organization. Furthermore, individuals with the education and training needed for this profession may have personality characteristics that differentiate them from a sample comprised of participants representing more heterogeneous occupations. Fourth, a major drawback of this study is the small sample size, particularly given the number of variables examined in this project. Although all individuals who had been in NYC on 9/11 were solicited to participate, there was a smaller than anticipated level of participation. While the exact reasons for this are unknown, it may be that since the data was collected a year after the event, many individuals no longer felt that it was a pressing topic. On the other hand, the members of the organization who chose to participate may be people who are still extremely bothered and were hoping to find some

solace in completing the packet. To speculate further, this sample could be comprised of individuals who find writing about their traumatic experience helpful.

The measurement packet created for this study was also somewhat lengthy which could have been a deterring factor for some potential participants. Additionally, some members of the organization suggested alternative ways of conducting this study (such as interviewing people), so they may have disagreed with the quantitative approach to the study and decided not to participate. Due to the organization's desire to conduct the recruitment to maintain confidentiality, the exact return rate for the study is also unknown which further complicates any effort to determine generalizability since there is no way to assess who chose not to participate and why. Fifth, the small sample size may also have affected the power for the study. While there were many important findings, there were also many hypotheses that were not supported.

Beyond sampling limitations, internet research generally has inherent limitations. First, only people with computer access and knowledge can participate. It is possible that this may have been less of an issue for this sample since computer usage is required for the work activities of many of the participants. Additionally, to partially correct this problem, hard copies of the measures were made available to requesting members, but no general mailing was conducted. Second, because of the complicated procedure of setting up a website, the measurement package was only able to be posted in one order. Therefore, it is possible that there may have been an ordering effect since no variation in measurement order could be provided.

Other limitations involve the use of self-report measures that can result in participant bias. Response biases, such as acquiescence effects (i.e., the propensity of

respondents to agree with or give affirmative answers to questionnaire items regardless of their substantive content) and social desirability effects (i.e., the tendency of respondents to distort answers in a favorable manner) may occur and obfuscate the findings. For example, in this particular sample, participants may want to feel that they have handled this September 11 trauma well so they may have been biased to answer more positively than what their actual experience was.

Another limitation of this study involves the psychometric weakness of some of the measures. This problem with measurement is evident with the measures related to the coping construct, specifically in the poor reliability in two measures (perceived controllability and coping efficacy) and the lack of an interpretable factor structure in the coping scale. For these reasons, a significant variable, coping was unable to be assessed. One explanation for this problem may be the selection of the coping measure. In order to decrease the time needed to complete the questionnaire booklets, and because the version selected had been specifically designed to use with samples who were facing a traumatic event, a shortened, less established version of the Ways of Coping Scale (Folkman & Lazarus, 1988) was utilized. Additionally, although, the Perceived Controllability and Coping Efficacy Scale (Conway & Terry, 1992) had adequate reliability in other samples, the alpha coefficients in previous studies were on the low end of acceptable reliability and therefore may not have been strong enough to use widely. For this sample, the directionality of the items in the Coping Efficacy Scale is questionable. Participants were asked to rate how well they thought they handled the event and to compare themselves with others. Because of the lack of control that people had in this situation, a participant may have rated themselves low on how they coped, but not thought that

someone else would do any better. For the purpose of the measure these two items should be directionally opposite responses, but when considering this event, it may simply be realistic to report that others could not have handled the event any better since the situation was uncontrollable. Therefore, the responses may theoretically not be opposite. The negative Cronbach's Alpha for this measure indicates that there was a significant problem with the directionality of items. For this reason, it seems that this measure would be more appropriately used in coping situations where individuals had more control over their ability to cope. It seems that sample variations may significantly affect these measures so that accessing coping with these measures in the manner prescribed (e.g., asking for self-report of the traumatic event as opposed to providing an objective description) was unexpectedly ineffective.

Additionally, both the measure for health perceptions and for impact of events two weeks after 9/11 had alpha coefficients below .70 which may indicate that the reliability of these two measures is questionable. In terms of the low reliability on the impact of events scale right after 9/11, it is possible that because the participants were rating this measure retrospectively that their recollections were inaccurate and therefore inconsistent. Using data that reflects the participants' current state would likely be more reliable. Furthermore, a different health measure may have been more appropriate for this sample as their physical health was minimally affected compared to people who remained in the New York area and were exposed to potential health hazards such as falling debris from the collapse of the towers. For this sample, a measure of somatic symptoms, such as the BSI, would have likely been more appropriate as it would measure physical manifestations of psychological distress. Finally, the items created to form the

institutional support measure seemed to be unsuccessful at accessing the construct in this sample. The items used asked to what extent three different institutional support systems had been helpful. It is possible that the questions asked were too specific to certain institutional support systems or that the systems presented were not they institutional support accessed by this group. Either way, the construct would have been more reliably and validly assessed with a more general and already established measure of institutional support.

Another shortcoming of the present study involves the collection of data for the three points in time. Because the participants were asked to rate their SWB, IES, and job satisfaction before 9/11 and two weeks after the event retrospectively, it is possible that their responses were not reflective of how they actually felt at that time. While one could argue that the perceptions of how the participants felt at the actual time of data collection (one year after the event) may be most important, the possibility of inaccuracy must also be acknowledged. Ideally, a longitudinal study with three separate data collections would have provided the most valid information about how the participants felt at the three times examined in this study. Additionally, factors such as current mood at the time of completing the measures might have impacted not only how respondents rated themselves one year after 9/11, but it could also have skewed their recollections of how they felt right before and right after September 11, 2001.

Finally, factors present pre-event may have confounded the findings of this study. For example, research had shown that there is a cumulative effect of experiencing traumatic events, so anyone with prior trauma history may not have been responding solely to 9/11 but rather, reacted to both 9/11 and previous traumatic memories.

Additionally, although significant variance in SWB, job satisfaction, and IES was accounted for in relation to some psychological variables and health perceptions, much of the variance was not explained by the selected variables. Therefore, other factors besides those examined in this study clearly may contribute to the adjustment of the World Trade Center victims. For example, self-esteem and goal directedness could be important factors in predicting adjustment but are beyond the scope of this study. While this study represents a comprehensive biopsychosocial battery of variables, it is not possible to examine every possible factor contributing to adjustment.

Implications and Future Research

This study contributes to the trauma and subjective well-being literature by focusing on factors that are related to adjustment after a major civilian terrorist attack. Additionally, it demonstrates how those experiencing the same traumatic event can respond very differently in terms of how they rate their subjective well-being, with some having reported a higher SWB, some having reported a lower SWB, others staying the same, and yet others briefly rating a higher SWB and then returning to baseline. These findings raise many questions about what variables may contribute to such different reactions. However, only optimism and two factors of the resiliency scale contributed uniquely to the explanation of why various people responded so differently to the 9/11 event in this study. For this reason, it is important for future research to continue to attempt to delineate why some people would report a higher level of SWB after such a traumatic event while others report decreased SWB. Because much of the literature on trauma has focused on the negative aspects of trauma, it is also important to examine what types of positive outcomes individuals may have after a traumatic event. For

example, it could be that some people report a higher SWB after a traumatic event because they are focusing on what is most important to them (e.g., family, faith), or they may feel gratitude that they were not harmed or killed in the event. While this study does not provide information on such specific areas, it does suggest that optimism, determination, and seeking meaning may be factors relating to increased SWB after a traumatic event. In line with Tedeschi and Calhoun's (1995) model of posttraumatic growth, future research should expand its focus from pathology to positive growth, such as continuing to examine what makes people subjectively view their lives as having a better quality and having more positive affect after a traumatic event. Additionally, trying to replicate and add to the findings of this study which indicate the importance of the role of optimism and resiliency by identifying more specific areas of positive thought may assist clinicians in trying to intervene with trauma victims and assist with their adjustment.

A major drawback to this study was the inability to examine coping styles, perceived controllability, and coping efficacy and their relationship to other significant variables and adjustment outcome variables. Future research should include more established measures of coping such as the original Ways of Coping scale (Folkman & Lazarus, 1988) or alternative ways of assessing coping such as describing what one did and then categorizing the reported methods of coping. Specifically, the relationship between coping styles and changes in SWB after a traumatic event is unexplored. Additional study in this area could assist clinicians to understand how various ways of coping with trauma could impact SWB right after an event and the more long-term

effects. Such knowledge would permit interventions to facilitate more adaptive coping in trauma victims.

One area that is certainly in need of additional research, particularly in light of the partial support of the model in this study, is the use of the biopsychosocial framework in trying to understand reactions to trauma. The biopsychosocial model has traditionally been a theoretical model used to conceptualize general health (Hoffman & Driscoll, 2001), but biopsychosocial factors have also been empirically shown to impact SWB in some areas (Domenici-Lake, 2002). Additionally, upon examining the extant literature on the effects of trauma on individuals, it is clear that the effects from various studies fall into all of the categories from the biopsychosocial model. Therefore, the question of why only parts of the model were supported must be explored further. For example, in this sample, several aspects of the psychological portion of the model were supported, but less was found for the biomedical and biosocial aspects. For this reason, a theory or model related to positive psychology characteristics may be a better fit for samples who are less likely to have a physical or health effect from a traumatic event. For future research, the biopsychosocial model may fit for samples experiencing a trauma that has more direct physical (e.g., exposure to environmental or disease factors) as well as psychological effects. For example, people who remained in the NYC area may have had either exposure to or fear of exposure to health hazards such as toxic chemical from the burning and fall of the Twin Towers. Therefore, the use of this model may be more appropriate with samples such as NYC residents who experienced 9/11/01. Furthermore, the addition of a measure of somatic symptoms may be a better indicator of health for a

traumatic event without evident biological consequences as some people experience psychological stress through somatic symptoms.

In examining biopsychosocial effects of trauma, length of time passed should be specifically explored. Previous literature often examines long term effects of trauma, particularly in terms of physical health (King et al., 1998; Martin et al., 2002; Stein & Barrett-Connor, 2000). Also, in this study, impact of event was only predicted by biomedical variables and psychological variables at one year after the event, which suggests that the full effects of the traumatic event may not truly be seen until months or even years after the trauma. For this reason, it may be important to conduct longitudinal studies using biopsychosocial variables in order to determine if the variables have a greater impact on the effects of the trauma as more time passes.

Despite the contribution of this study in the area of SWB, resiliency, and optimism, there are many methodological improvements that could be made in future studies to bolster and expand the current findings. For example, increasing the sample size may increase the power of the study. In the same way, trying to utilize a more representative sample is imperative to truly understand the impact of trauma upon the general population. For example, having a more balanced gender representation would be helpful as gender differences in trauma reactions have been noted in the literature (Breslau, 2001; De Marco, 2000; Foa & Street, 2001; Martin et al., 2002; Purves & Erwin, 2002; Zlotnick, Zimmerman, Wolfsdorf, & Mattia, 2001), despite the lack of a gender difference in this study. Additionally, it may be that there are cultural differences in the way people respond to traumatic events, but due to the homogeneity of this sample, cultural differences could not be assessed. The subjective well-being literature also

suggests that other factors such as socioeconomic status (Campbell et al., 1976; Diener, 1984, 1994; Robbins & Kliewer, 2000) can affect SWB. For that reason, including participants from a variety of socioeconomic and educational backgrounds would both increase generalizability and expand the knowledge of the role of certain demographic variables on adjustment after a traumatic event.

Along with these suggestions, scholars are encouraged to expand on the current study by conducting longitudinal research that both gathers data at various points in time, as opposed to collecting data retrospectively, and examines reactions for a duration longer than a year in order to assess more long term reactions. The addition of a comparison group of individuals not exposed to a trauma would also help to isolate the effect of the trauma compared to normal fluctuations in SWB that may occur. Through the addition of these research designs, changes in SWB and other psychological reactions can be identified as a function of the traumatic event.

While psychological factors such as resiliency and optimism were both predictors of SWB and distinguishing factors in cluster membership for changes in SWB over time, they only accounted for a little less than a quarter of the variance (23.2%) a year after September 11 and even less before and right after 9/11. For this reason, future research needs to attempt to delineate additional factors that may contribute to changes in SWB following a traumatic event. Similarly, because these factors did not predict impact of event or job satisfaction, the question of what predicts these two variables also remains. Since the literature suggests that factors such as social support should predict adjustment by buffering the emotional impact of stressful life events (Cohen & and Wills, 1985), researchers are encouraged to include non-significant variables from this study in

addition to factors (such as extroversion or neuroticism) that were beyond the scope of this study. Furthermore, the use of qualitative research or the examination of open-ended responses would provide more individualized and specific data about potentially important variables.

To conclude, this study contributes to the subjective well-being and trauma literature by expanding current knowledge to include an examination of how this sample of civilians responded to a large scale terrorist attack. Much of the extant literature on trauma focuses on military populations and on the negative impacts of a traumatic event by examining physical and mental pathology that may arise after a traumatic experience. This study is unique because it focused on a non-military sample, but also because it examined how a traumatic event impacts an individual's subjective well-being, or quality of life and positive and negative affect. The sample obtained for this project provides a rare opportunity to study a group of people who experienced the same traumatic event at the same time. Because the events of September 11 were an unprecedented large-scale, civilian trauma, it is imperative that the reactions of Americans, particularly those present that day, be studied to expand our understanding of how people respond to such an event and to enhance mental health professionals' ability to assist victims.

While many studies have demonstrated the maladaptive reactions that people have to trauma, this study provides evidence that some people actually report a higher level of SWB following a traumatic event. This study suggests that people with higher levels of resiliency, specifically more feelings of determination and willingness to seek meaning, and less negativity and helplessness, will also report a higher level of subjective well-being after dealing with a traumatic event. Furthermore, people who are generally more

optimistic will also report greater subjective well-being after a traumatic event and are less likely to feel that the event was intrusive one year later. These findings support the possibility of certain positive traits playing an important role in coping and adjustment. Because of the ever present possibility of additional trauma, either terrorist attack or other, it is important to know how people respond to such an event and understand what factors may facilitate a positive adjustment. This study contributes to the understanding of how people respond to trauma and provides guidance to mental health professionals who may work with trauma victims. It both supports current knowledge and contributes to the trauma and subjective well-being literature by demonstrating that some people are able to find meaning and hope even in the midst of the most horrific trauma.

Appendix A

Demographic Questionnaire

Instructions: Please provide the following information about yourself.

1. **Age:** _____
2. **Gender:**
Male
Female
3. **Race or ethnicity:**
African-American/Black
White/Caucasian/European American
Asian American/Pacific Islander
Latino/a
American Indian/Alaskan Native
Middle Eastern
Mixed Race (please describe) _____
Other (please describe) _____
4. **What is your highest educational level:**
Some high school
High school graduate/GED
Some college
Associate's degree
College degree
Master's degree
Ph.D, M.D., J.D.
5. **Please indicate which of the following best describes your relationship situation:**
Married/significant other/partnered
Separated/divorced
Single (never married)
Widowed
6. **Number of children:**
7. **What is your occupation:**
8. **Please indicate religious/spiritual affiliation:**
Agnostic
Atheist
Buddhist
Christian
Hindu
Jewish
Muslim
Other: _____
9. **Please rate how important your spirituality or religious involvement is to you:**
Extremely important
Fairly Important
Slightly important

- Not very important
Not at all important
- 10. Has either your work or living situation changed in any way since 9/11 (e.g., lost job, moved)? If yes, please explain.**
 - 11. Please describe where you were on 9/11.**
 - 12. Who was with you (e.g., spouse, child, friend, colleague)?**
 - 13. Please briefly describe your experience (what you saw, heard, or did) on that morning.**
 - 14. What were your immediate reactions to the events of 9/11?**
 - 15. Did you know anyone injured during the events? If yes, please describe relationship to you.**
 - 16. Did you know anyone who died as a result of the events of 9/11? If yes, please describe relationship to you.**
 - 17. Have you experienced a traumatic event other than 9/11? If yes, please briefly describe and indicate how long ago it occurred.**
 - 18. Has your overall quality of life changed since 9/11?**
Decreased greatly
Decreased somewhat
Stayed the same
Increased somewhat
Increased greatly
 - 19. Has your work satisfaction changed since 9/11?**
Decreased greatly
Decreased somewhat
Stayed the same
Increased somewhat
Increased greatly
 - 20. Have you sought mental health treatment since 9/11?**
 - 21. If yes, what is the duration of treatment?**
 - 22. If yes, how helpful has your treatment been?**
Extremely helpful
Fairly helpful
Slightly helpful
Not very helpful
Not at all helpful
 - 23. Has your overall quality of life changed since 9/11?**
Decreased greatly
Decreased somewhat
Stayed the same
Increased somewhat
Increased greatly
 - 24. Has your health status changed since 9/11?**
Decreased greatly
Decreased somewhat
Stayed the same
Increased somewhat

- Increased greatly
- 25. If you smoke, has your cigarette usage changed since 9/11?**
 - Decreased greatly
 - Decreased somewhat
 - Stayed the same
 - Increased somewhat
 - Increased greatly
- 26. If you consume alcohol, has your alcohol consumption increased since 9/11?**
 - Decreased greatly
 - Decreased somewhat
 - Stayed the same
 - Increased somewhat
 - Increased greatly
- 27. If you use prescription drugs, has your use of prescription drugs changed since 9/11?**
 - Decreased greatly
 - Decreased somewhat
 - Stayed the same
 - Increased somewhat
 - Increased greatly
- 28. Do you have contact with other NABE members who were present at the conference on 9/11? How often?**
- 29. Did you attend the reunion in Washington, D.C. in March 2002?**
- 30. If yes, did you find it helpful or comforting?**
 - Extremely helpful
 - Fairly helpful
 - Slightly helpful
 - Not very helpful
 - Not at all helpful

Appendix B
GHP-5

	Poor	Fair	Good	Very Good	Excellent
1. In general, would you say your health is:	1	2	3	4	5
	Not at All True	A little True	Neutral	Fairly True	Very True
2. I seem to get sick a little easier than other people.	1	2	3	4	5
3. I am as healthy as anybody I know.	1	2	3	4	5
4. I expect my health to get worse.	1	2	3	4	5
5. My health is excellent.	1	2	3	4	5

Appendix C
Personal Resiliency Beliefs Scale

Directions: For the next 30 items, please read each statement and fill in the bubble corresponding to the number that most closely reflects how you feel about each item.

	Strongly disagree:	Disagree:	Agree:	Strongly agree:
	1	2	3	4
	Strongly Disagree	Disagree	Agree	Strongly Agree
1) I feel like I can influence my life situation.	1	2	3	4
2) My belief in a higher power helps me when life is hard.	1	2	3	4
3) If something goes wrong, I go to a higher power for help.	1	2	3	4
4) I am a survivor.	1	2	3	4
5) I see difficulty as a challenge from which I can learn.	1	2	3	4
6) My faith/spirituality gives me hope when life seems bleak.	1	2	3	4
7) My faith/spirituality doesn't really impact my life that much.	1	2	3	4
8) Things rarely seem to work out in my favor.	1	2	3	4
9) There is someone in my life whom would be there no matter what.	1	2	3	4
10) I believe that a higher power is there for me when life is challenging.	1	2	3	4
11) I expect that the worst will happen.	1	2	3	4

12) I believe there are people who I could ask for help in difficult times.	1	2	3	4
13) I generally feel bad about myself.	1	2	3	4
14) My faith/spirituality does not help me deal with life's difficulties.	1	2	3	4
15) It doesn't seem like there is anybody that I could look to for support if I were having a hard time.	1	2	3	4
16) I tend to see the negative things in life.	1	2	3	4
17) I find my faith/spirituality to be comforting in times of need.	1	2	3	4
18) I can make the best of a bad situation.	1	2	3	4
19) I believe that I can handle stressful events.	1	2	3	4
20) I am committed to finding the positive aspects of life.	1	2	3	4
21) When something bad happens, I feel like there is someone I can talk to.	1	2	3	4
22) I can deal with difficulty in life.	1	2	3	4
23) When bad things happen, I want to just give up.	1	2	3	4
24) Things can happen in life that are too much for me to handle.	1	2	3	4
25) My feeling of self-worth gives me strength during stressful times.	1	2	3	4
26) I believe that I have what it takes to make it through life's struggles.	1	2	3	4

- | | | | | |
|--|---|---|---|---|
| 27) I have a strong will that helps me keep going even through the toughest experiences. | 1 | 2 | 3 | 4 |
| 28) My faith/spirituality gives me strength during times of hardship. | 1 | 2 | 3 | 4 |
| 29) I believe I gain strength from working through difficult experiences. | 1 | 2 | 3 | 4 |
| 30) Even when things go wrong in my life, I won't give up. | 1 | 2 | 3 | 4 |

NEXT, WE WANT TO KNOW HOW YOU COPEd WITH THE STRESSFUL 9/11 EVENT YOU JUST DESCRIBED. PLEASE READ EACH ITEM BELOW AND INDICATE, BY MARKING THE APPROPRIATE CATEGORY, TO WHAT EXTENT YOU USED IT IN THE SITUATION YOU HAVE JUST DESCRIBED.

	Does not apply or not used 0	Used somewhat 1	Used quite a bit 2	Used a great deal 3
1. I went over the situation again and again in my mind to try to understand it	0	1	2	3
2. I felt that time would make a difference and the only thing to do was to wait.	0	1	2	3
3. Talked to someone to find out more about the situation	0	1	2	3
4. Hoped a miracle would happen.	0	1	2	3
5. Went along with fate; sometimes I just have bad luck.	0	1	2	3
6. I went on as if nothing had happened	0	1	2	3
7. Looked for the silver lining, so to speak; 0 tried to look on the bright side of things.	0	1	2	3
8. Tried to seek out sympathy	0	1	2	3
9. Tried to do something creative	0	1	2	3
10. Tried to forget the whole thing.	0	1	2	3
11. Tried to make changes in a good way	0	1	2	3
12. Decided to wait and see what would happen	0	1	2	3
13. Tried to come up with a plan of action	0	1	2	3
14. Did not go with my first hunch	0	1	2	3

15. Tried to let feelings out	0	1	2	3
16. Decided to rediscover life	0	1	2	3
17. Asked a friend what he/she thought	0	1	2	3
18. Decided to try to change something	0	1	2	3
19. Talked to someone about how I was feeling.	0	1	2	3
20. Drew on past experience	0	1	2	3
21. Thought about what could be done	0	1	2	3
22. Considered different solutions	0	1	2	3
23. Tried to accept the situation	0	1	2	3
24. Tried to keep my feelings from interfering with other things too much	0	1	2	3
25. Wished that I could change what had happened or how I felt.	0	1	2	3
26. I daydreamed or imagined a better time	0	1	2	3
27. Wished that the situation would go away or somehow be over with.	0	1	2	3
28. Had fantasies or wished about how things might turn out.	0	1	2	3
29. I went over in my mind what I would say or do.	0	1	2	3
30. Tried to see other perspectives	0	1	2	3

Appendix E
Coping Efficacy

YOUR PERCEPTIONS OF YOUR STRESSFUL EVENT RELATED TO 9/11
Please circle one response for each question using the following 5-point rating scale:

1. Given the circumstances, how well do you think you handled the situation (event) you described above?

Not well at all	Not very well	Fairly well	Very well	Extremely well
1	2	3	4	5

2. Do you think other people would have dealt with this situation better than you?

No, definitely not	No, probably not	Unsure	Yes, probably	Yes, definitely
1	2	3	4	5

3. In dealing with the situation, do you think that there were some things you could have done better?

No, definitely not	No, probably not	Unsure	Yes, probably	Yes, definitely
1	2	3	4	5

4. How satisfied were you with your attempts to manage the situation you described above?

Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
1	2	3	4	5

Appendix F
Appraised Controllability

PERCEIVED CONTROLLABILITY OF STRESSFUL 911 EVENT

Please circle one number on a scale ranging from 1 (Not at all) to 5 (Very much):

Not at all					Very much
1	2	3	4	5	
<hr/>					
1. How much do you feel that the outcome of the situation is beyond your control?	1	2	3	4	5
2. How much do you feel that the situation is something you can change or do something about?	1	2	3	4	5
3. How much do you feel that you have to accept the situation as there is nothing you can do to change it?	1	2	3	4	5
4. How much do you feel that you can take steps to resolve the situation?	1	2	3	4	5
5. How much do you feel that the outcome of the situation will be influenced by factors external to yourself?	1	2	3	4	5
6. How much do you feel that your abilities will influence the outcome of the situation?	1	2	3	4	5
7. How much do you feel that you had control over the situation?	1	2	3	4	5
8. How much do you feel that the situation occurred because of some factor external to yourself?	1	2	3	4	5
9. How much do you feel that the situation occurred because of something you did?	1	2	3	4	5

Appendix G

Center for Epidemiological Studies-Depression Scale

Click the circle for each statement which best describes how often you felt or behaved this way - DURING THE PAST WEEK.

1= Rarely or None of the Time (Less than 1 Day)

2= Some or Little of the Time (1-2 Days)

3= Occasionally or a Moderate Amount of the Time (3-4 Days)

4= Most or All of the Time (5-7 Days)

1.	I was bothered by things that usually don't bother me	1	2	3	4
2.	I did not feel like eating; my appetite was poor	1	2	3	4
3.	I felt that I could not shake off the blues even with help from my family or friends	1	2	3	4
4.	I felt that I was just as good as other people	1	2	3	4
5.	I had trouble keeping my mind on what I was doing	1	2	3	4
6.	I felt depressed	1	2	3	4
7.	I felt that everything I did was an effort	1	2	3	4
8.	I felt hopeful about the future	1	2	3	4
9.	I thought my life had been a failure	1	2	3	4
10.	I felt fearful	1	2	3	4
11.	My sleep was restless	1	2	3	4
12.	I was happy	1	2	3	4
13.	I talked less than usual	1	2	3	4
14.	I felt lonely	1	2	3	4
15.	People were unfriendly	1	2	3	4
16.	I enjoyed life	1	2	3	4
17.	I had crying spells	1	2	3	4
18.	I felt sad	1	2	3	4
19.	I felt that people disliked me	1	2	3	4
20.	I could not get "going"	1	2	3	4

Appendix H
Life Orientation Questionnaire

Please indicate your agreement with these statements using the following 5-point scale:

0 Strongly Disagree	1 Disagree	2 Neither agree nor disagree	3 Agree	4 Strongly agree		
1.	In uncertain times, I usually expect the best.	0	1	2	3	4
2.	It's easy for me to relax.	0	1	2	3	4
3.	If something can go wrong for me, it will.	0	1	2	3	4
4.	I'm always optimistic about my future.	0	1	2	3	4
5.	I enjoy my friends a lot.	0	1	2	3	4
6.	It's important for me to keep busy.	0	1	2	3	4
7.	I hardly ever expect things to go my way.	0	1	2	3	4
8.	I don't get upset too easily.	0	1	2	3	4
9.	I rarely count on good things happening to me.	0	1	2	3	4
10.	Overall, I expect more good things to happen to me than bad.	0	1	2	3	4

Appendix I

SPS

Instructions: In answering the following questions, think about your current relationships with friends, family members, co-workers, community members and so on. Then indicate by circling the correct number, to what extent each statement describes your current relationships with other people. Use the following scale to give your opinions:

	1	2	3	4
	strongly disagree			strongly agree
1. There are other people I can depend on to help me if I really need it.	1	2	3	4
2. I feel that I do not have close personal relationships with others.	1	2	3	4
3. There is no one I can turn to for guidance in times of stress.	1	2	3	4
4. There are people who depend on me for help.	1	2	3	4
5. There are people who enjoy the same social activities I do.	1	2	3	4
6. Other people do not view me as competent.	1	2	3	4
7. I feel personally responsible for the well-being of another person.	1	2	3	4
8. I feel part of a group of people who share my attitudes and beliefs.	1	2	3	4
9. I do not think that other people respect my skills and abilities.	1	2	3	4
10. If something went wrong, no one would come to my assistance.	1	2	3	4
11. I have close relationships that provide me with a sense of emotional security and well-being.	1	2	3	4
12. There is someone I could talk to about important decisions in my life.	1	2	3	4
13. I have relationships where my competence and skills are recognized.	1	2	3	4
14. There is no one who shares my interests and concerns.	1	2	3	4
15. There is no one who really relies on me for his or her well-being.	1	2	3	4
16. There is a trustworthy person I could turn to for advice if I were having problems.	1	2	3	4
17. I feel a strong emotional bond with at least one other person.	1	2	3	4
18. There is no one I can depend on for aid if I really need it.	1	2	3	4
19. There is no one I feel comfortable talking about my problems with.	1	2	3	4
20. There are people who admire my talents and abilities.	1	2	3	4
21. I lack a feeling of intimacy with another person.	1	2	3	4
22. There is no one who likes to do the things I do.	1	2	3	4
23. There are people I can count on in an emergency.	1	2	3	4
24. No one needs me to care for him or her.	1	2	3	4

Appendix J

Institutional Support

Please use the following 5-point scale to rate the extent to which you've utilized supports and services following September 11th:

	Not at All		To a Great Extent		
1. I have received support from a religious or spiritual community.	1	2	3	4	5
2. I have utilized counseling or other mental health services (psychotherapy, crisis lines, support groups).	1	2	3	4	5
3. I utilized the reunion for NABE Members or other NABE related assistance to help me deal with this event.	1	2	3	4	5

Appendix K
SWLS

Instructions: Below are five statements in which you may agree or disagree. Using the 1 – 7 scale below, indicate your agreement with each item by placing the appropriate number on the line following that item. The 7-point scale is:

1	2	3	4	5	6	7
strongly	disagree	slightly	neither	agree	slightly	agree
agree	strongly	disagree	agree nor	disagree		
disagree			disagree			agree

1. In most ways my life is close to my ideal. _____
2. The conditions of my life are excellent. _____
3. I am satisfied with my life. _____
4. So far I have gotten the important things I want in life. _____
5. If I could live my life over, I would change almost nothing. _____

Appendix L

PANAS

Instructions: This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way **during the past few weeks.** Use the following scale to record your answers.

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely
_____	interested	_____	irritable	
_____	distressed	_____	alert	
_____	excited	_____	ashamed	
_____	upset	_____	inspired	
_____	strong	_____	nervous	
_____	guilty	_____	determined	
_____	scared	_____	attentive	
_____	hostile	_____	jittery	
_____	enthusiastic	_____	active	
_____	proud	_____	afraid	

Appendix M
Intrusion of Event Scale

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 time since 9/11. If they did not occur during that time, please mark the "not at all" column.

	Not at All 1	Rarely 2	Sometimes 3	Often 4
<hr/>				
1. I thought about it (9/11) when I didn't mean to.	1	2	3	4
2. I avoided letting myself get upset when I thought about it.	1	2	3	4
3. I tried to remove it from memory.	1	2	3	4
4. I had trouble falling asleep or staying asleep, because of pictures or thoughts about it that came into my mind.	1	2	3	4
5. I had waves of strong feelings about it.	1	2	3	4
6. I had dreams about it.	1	2	3	4
7. I stayed away from reminders of it.	1	2	3	4
8. I felt as if it hadn't happened or it wasn't real.	1	2	3	4
9. I tried not to talk about it.	1	2	3	4
10. Pictures about it popped into my mind.	1	2	3	4
11. Other things kept making me think about it.	1	2	3	4

- | | | | | |
|---|---|---|---|---|
| 12. I was aware that I still had a lot of feelings about it, but I didn't deal with them. | 1 | 2 | 3 | 4 |
| 13. I tried not to think about it. | 1 | 2 | 3 | 4 |
| 14. Any reminder brought back feelings about it. | 1 | 2 | 3 | 4 |
| 15. My feelings about it were kind of numb. | 1 | 2 | 3 | 4 |

Appendix N
Job Satisfaction

	Very Dissatisfied	dissatisfied	somewhat dissatisfied	neutral	somewhat satisfied	satisfied	very satisfied		
	1	2	3	4	5	6	7		
1. Overall, how satisfied were you with your job before September 11, 2001?			1	2	3	4	5	6	7
2. Overall, how satisfied are you now with your job since September 11, 2001?			1	2	3	4	5	6	7

Appendix P
Invitation to Participate and Consent Letter

Initial Email contacting potential participants known to us

You are in a unique position to help us with some very important research about the events of September 11, 2001. I am a psychology graduate student working with a psychologist at the University of Maryland to study the effects of the September 11th events on people who were in the World Trade Center on the morning of September 11, 2001. Across the country, people have been deeply affected, sought support, and looked for ways to help. For those of you who were in the New York City area that day, the impact of these events has been more direct and personal to your lives. You have been sent this email because you have been identified as an NABE member who may have experienced the events of September 11th. Your participation in our study will help us better assist others who experience stressful, unanticipated events such as this in the future. Your personal reaction is **valuable** to us because we are interested in **all types and ranges** (both positive and negative) of reactions to September 11th and the months following this event.

We hope you will be willing to help! Please check out our secure website at HYPERLINK <http://www>. (Website will be inserted when created) to learn more about the study and our incentives for participation.

Thanks,

Stacey E. Holmes, M.A. and Mary Ann Hoffman, PhD: University of Maryland

Note: This email will only be distributed by NABE to NABE members .

Message that potential participants will find when they access our website:**Dear NABE members,**

I am a psychology graduate student working with a psychologist at the University of Maryland to study the effects of the September 11th events on people who were in the World Trade Center on the morning of September 11, 2001. You have been identified by NABE as someone who might have been in the World Trade Center Marriott on September 11 and, therefore, as someone who might be able to help us better understand the range of personal reactions to these events.

The events of September 11th had an impact on all of us. Across the country, people have been deeply affected, sought support, and looked for ways to help. For those of you who were in the Marriott that day, the impact of those events has been more direct and personal to your lives. Your participation will help us assist others that might experience similar stressful, unanticipated events in the future. September 11th represented an unprecedented event in our country, and psychologists could benefit from understanding your ongoing reactions. How will this event be perceived as time passes by? Your personal reaction is valuable to us because we are interested in all types (*both positive and negative*) of reactions.

Our study is very straightforward. We are looking at a variety of important aspects of life: health, social support, mood, and personal characteristics and circumstances to see how these variables have affected reactions to the events of September 11th. Now that you are at our website, you may review the questionnaire and decide if you want to participate. It will take you about 30-45 minutes to complete the questionnaire. Please see additional information below regarding protecting your privacy and ways to contact the principal investigator.

We realize that you are very busy and that your time is extremely valuable, but understanding how we are adjusting to this tragedy is critical for helping others both now and in the future. Please help us by taking this time to answer this questionnaire. We need lots of completed measures so that we can do a good analysis and only NABE members can help with this study. Thanks for helping and please encourage your associates to help!

The U. of Maryland 911 Research Team:

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Confidentiality: All information collected in the study is confidential, and you will not be identified at any time. All questionnaires will be kept in a secure, locked cabinet in a locked room at the University of Maryland. Your email address will be kept in a locked cabinet separate from your questionnaire and will only be used to give you a summary of the findings of our study.

Risk/benefit statement: There are no known risks to your participation in this research. The research is not designed to help you personally, but the investigators hope to learn more about the range of reactions people have to a catastrophic event. Completion of the questionnaires may be helpful, as it will give you an opportunity to describe your reactions and to help others who may be in similar situations in the future.

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Consent: Completion of the questionnaires constitutes your consent to participate in the study.

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