

Community Solidarity and Well-Being after the Virginia Tech Shootings

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Abstract

In the aftermath of the rampage at Virginia Tech, the community experienced a surge of social solidarity. Using a longitudinal study of 478 students, this thesis examines the impact of attitudinal solidarity on well-being nine months after the shootings. In particular, this study focuses on the interaction effects of sex and solidarity on later well-being, providing a theoretical and empirical basis for understanding the connections between these factors. Quantitative analysis, conducted using linear regression with interaction variables, found that social solidarity four months after the shootings positively and significantly predicted well-being nine months after the shootings. The predictive power, however, was stratified by sex; women experienced diminished benefits of solidarity relative to their male counterparts. The literature suggests that this disparity may be attributed to additional social burdens placed on women after traumatic stressors. Other negative predictors of well-being include knowing victims and conversations with the media in the week after the attacks. This research has the potential to shed light on effective methods of responding to community-level trauma and may provide guidance to future policy-makers in when faced with these challenging situations.

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Chapter 1: Introduction

Durkheim (1964 [1893]) asserts that crimes, especially those of a particularly cruel and violent nature, have the power to spark the collective conscience of the society in which they occur. This spark often creates a sense of solidarity and produces communal responses that reinforce social bonds and preserve the unity of the society. A good deal of literature has discussed the ability of crime to produce solidarity (Barnshaw, Letukas and Oloffson 2008; Barton 1969; Carroll et al. 2005; Collins 2004; Hawdon and Ryan 2011; Hawdon, Ryan and Agnich 2010; Miki 2002; Ryan and Hawdon 2008; Shrum 2007; Smelser 2004; Sweet 1998; Turkel 2002). The impacts of solidarity, however, may differ among affected populations in the aftermath of large-scale crimes. In particular, men and women may experience social solidarity differently after these events, and this may impact their long-term outcomes.

Background

On the morning of Monday, April 16, 2007, a college senior rampaged the campus of Virginia Tech, a public land-grant university in rural southwest Virginia. After murdering two students in the West Ambler Johnston dormitory, the shooter made his way across campus to Norris Hall. He then killed 25 more students and five faculty members before taking his own life. It remains the most deadly mass-shooting in American history (Altamirano 2007). Though the gunfire spanned just nine minutes, the recovery process continues at the time of this writing.

Responses to the tragedy commenced immediately. Media outlets swarmed the campus, and the tiny town of Blacksburg became the focus of front-page news around the globe. The university canceled classes for the week and held several formal public events. On the morning following the shooting spree, Virginia Tech held a convocation, attended by some 10,000 participants and then-president George W. Bush, in which school officials shared sentiments with the local community and the world (Fletcher 2007). A candlelight vigil and community picnic followed. In addition, the university placed dozens of blank message boards on the Drillfield, the central point of the campus, where community members could write messages.

In addition to these collective responses, individuals also responded in private. With classes canceled, many people watched television, listened to music, purchased Virginia Tech merchandise, patronized local businesses, and sought out counseling services. They also

conversed with family, friends, and community members. Some recovered with greater speed and success than others.

Statement of Problem

The purpose of this study is to investigate whether feelings of solidarity served as a protective factor on well-being of Virginia Tech students after the 2007 shootings, and if so, to determine the effects of solidarity on well-being by sex. While numerous personal reflective accounts of the Virginia Tech shootings exist (Cox 2008; Figley and Jones 2008; Geller 2008; Gervich 2008; Keeling and Piercy 2008; Nowak and Veilleux 2008), the literature has not fully examined solidarity after the Virginia Tech shootings, particularly the differential impacts of solidarity on well-being by sex. The data for this study were collected from a sample of Virginia Tech students as part of a longitudinal survey designed to understand the effects of the 2007 attack on the community (Hawdon and Ryan 2011). A quantitative, interpretative approach will be used to assess these responses.

This proposed topic bears significance for a number of reasons. Though school shootings are quite rare occurrences, they cause the same or similar acute traumatic stress that accompanies a broad range of events. Natural disasters, highly-publicized violence, and unexpected deaths impact localities on a regular basis. This study seeks to expand current knowledge about the role of solidarity in well-being after trauma, and can provide information on the impact of major traumatic events on the immediate population.

Additionally, this research may deliver valuable insights for future communities devastated by tragedy. It can inform public policymakers and first responders about effective ways to reach out to their constituents to deliver support services in a timely manner and ensure maximum long-term healing. It can provide insights about the effectiveness of social solidarity in the recovery process, which can allow leaders to frame messages in manners that may maximize benefits to the affected population. This research may also pinpoint specific groups that should be targeted for special focus and assistance in the event of an acute traumatic stressor.

Chapter 2: Literature Review

This literature review (1) explores the empirical link between sex, social support networks, and stress after trauma; (2) discusses the conditions under which solidarity emerge; (3) briefly covers the history and extent of campus shootings; (4) establishes an understanding of the disparate impacts of victimization by status in the community; (5) provides an overview of research on community-level traumatic stressors and their differential psychological impacts on the population by location in the social structure; and (6) develops a theoretical basis for understanding the interactions between sex, solidarity, and well-being after the Virginia Tech rampage.

Sex, Social Networks, and Traumatic Stress

According to network theory, women and men have different social networks because they occupy different social structural positions (Fischer and Oliner 1983). These social networks provide social support, which comes in the forms of emotional support, instrumental support, informational support, and appraisal support (Fischer and Oliner 1983). The literature demonstrates that women have larger social networks than men (Loscocco et al. 2009). Despite having large social networks, women have higher rates of post-traumatic stress and other mental health issues in the face of traumatic events than do their male counterparts (Arata et al. 2000; Breslau 2009; Grieger, Fullerton and Ursano 2003; Palinkas et al. 1993; Schlenger et al. 2002; Schuster et al. 2001).

This disparity between social networks and distress is a contradiction, since personal ties buffer people from harm and distress by providing support or directing them to resources (Uehara 1994). One possible explanation is that women assume the caretaker role during emergencies and, because they tend to be more socially connected than men, this places on them a larger responsibility to support others. In everyday life, women bear greater pressures to provide support, which results in adverse effects on their mental and possibly physical health (House 1987; Kessler and McLeod 1984). This responsibility also extends to the aftermath of trauma, when women provide both caretaking and social support at higher levels than men (Harada 2000; Ketteridge and Fordham 1995; Sims et al. 2009). As Kawatch and Berkman point out (2001), “social connections may paradoxically increase levels of mental illness symptoms

among women with low resources, especially if such connections entail role strain associated with obligations to provide social support to others.”

Solidarity

Communal bereavement, which refers to widespread distress among individuals who experience a collective loss (Catalano and Hartig 2001), is often applied to mass-tragedies like the September 11 terrorist attacks and the rampage at Columbine High School. Solidarity also frequently emerges after traumatic events as a coping mechanism for widespread distress, as was the case in Blacksburg (Hawdon, Ryan and Agnich 2010). However, in order for an event to spurn solidarity, Ryan and Hawdon (2008) hypothesize that it will likely meet four conditions:

First, it is likely that a collective must define the tragedy as affecting the collective for the tragedy to be a source of solidarity... Second, and related to the first, it is likely that the tragic event must be, in Goffmanian terms, a “fateful event” that disrupts the routine of everyday life... Third, for a tragedy to produce solidarity, it is likely that the victimized collective must not be seen as a willing participant to the tragedy... Fourth, for a tragedy to stimulate solidarity, it is likely that the victimized collective must be defined as a “moral collective.”

As they point out, all of these stipulations were met after the Virginia Tech shootings. The process through which conflict produces solidarity occurs in four phases (Collins 2004). The first period, one of shock, is characterized by “idiosyncratic individual reactions.” In the case of Virginia Tech, students and community members initially expressed terror, helplessness, and uncertainty; many people watched the news and engaged in small-group interactions. During the second period, lasting one to two weeks, the community establishes standardized displays of solidarity symbols. Many of these symbols emerged informally, such as the display of Virginia Tech clothing, ribbons, car magnets, and colors (Roy 2009). Others, like the repetition of the slogans “We will prevail” and “We are Virginia Tech,” emerged from the formal Convocation ceremony organized by the university on the morning after the shootings. These words, as well as references to the candlelight vigil held on the evening after the shootings, appeared frequently in shop windows, on Internet social networking profiles, and in news reports. The ongoing display of symbols such as these constitutes the third period of solidarity and, according to Collins, plateaus for about two to three months. Finally, the gradual decline to normalcy occurs six to nine months after the event. The academic calendar complicated the timetables for the

third and fourth stages, since a four-month break began abruptly on April 16 and stretched through summer. Solidarity events and symbols continued to appear throughout the following academic school year.

Throughout this process, grief counselors, clergy, politicians, and other leaders emerged from all over the country to provide immediate and long-term support to the community (Immel and Hadder 2008). These responders served students, faculty, staff, and Blacksburg residents. Despite their own distress, or perhaps because of it, local community members engaged in formal and informal displays of solidarity and care-giving (Keeling and Piercy 2008). Professors made themselves available to students, people stood on the Drill Field offering “free hugs” to strangers, and messages of support appeared in front of businesses across town (Roy 2009).

These demonstrations of community solidarity are common after traumatic events. Columbine High School held a rally on the first day of the school year following the shootings in Littleton, Colorado (Cullen 2009). After September 11, sixty percent of those surveyed indicated that they participated in some sort of group or public gathering to commemorate the tragedy (Schuster et al. 2001). Due to the rise in multidirectional media, these displays are now increasingly taking place in online forums (Arthur 2009).

Solidarity serves as a protective factor after traumatic stressors. Displays of solidarity provide emotional support, strengthen existing social networks, provoke collective action, and confirm unity of the group (Eyre 2007; Turkel 2002). It also reinforces norms of trust and reciprocity among group members (Campbell 2000). Therefore, solidarity functions as a resource in parallel fashion to, and in conjunction with, social support networks.

Access to this solidarity depends on one’s position within the social structure. According to Campbell (2000), the social structure is the total collection of social networks that make up the entire communal group. These networks may be based on a variety of factors, including affection, coercion, or functional interdependence (Hawdon and Ryan 2011). Resources, both informational and material, flow through this social structure among individuals and organizations (Campbell 2000; Peacock and Ragsdale 1997). Likewise, Ryan and Hawdon posit that feelings of solidarity flow through these networks as well (2008).

Johnson and Hobfoll’s (2010) model of distressed responses to terrorism holds particular relevance for the members of the Virginia Tech community and provides an interesting framework for understanding the relationship between solidarity, sex, and distress. The model

contains four interacting parts. *Sociodemographics* of an individual include race, ethnicity, sex, age, and socioeconomic status. His or her *resources* may be economic, psychological, personal, and/or social; these resources can be lost or gained. Social solidarity may be viewed as a resource that may provide support at any of these levels. His or her *exposure to terrorism* (or in this case, exposure to the shootings) includes degree of injury, degree of exposures, quantity of exposures, and whether those exposures were direct or indirect. These three factors interact to inform the experience and symptoms of *distress*, the outcome variable of the model.

Victimization Processes

In the aftermath of violence, victims face complex circumstances that can vary by many factors, including proximity to the crime and type of victimization. Morrall (2006: 129) defines three levels of victimization from homicide. Primary victims are those who suffer directly from an act of violence, which, in the case of the Virginia Tech shootings, would include those who were physically injured or killed. Secondary victims are the significant figures in the lives of primary victims and perpetrators. The secondary victims of the Virginia Tech shootings include the family, friends, professors, work associates, and/or romantic partners of those wounded or killed, as well as those of Cho himself. Tertiary victims are those within the wider social networks of primary and secondary victims, encompassing the communities and societies of these victims. Murdered individuals have hundreds or even thousands of contacts, which creates an enormous network of secondary victims associated with every murder (Hickey 2003).

Secondary victims often face unique and difficult challenges in the wake of a homicide. According to Morrall, compared to those who lose a loved one from natural causes, “secondary victims of murder are more angry, more anguished, and more stigmatized” (2006). Victoria Cummock (1995) points out the difficulties of secondary victimization for those who are affected by murder. The suddenness and intentionality of the act often heightens their grief. The official processes can be traumatizing, including those of identifying a body, dealing with funeral arrangements, and sorting out personal belongings. The pain of the grieving process can be exacerbated even further by the intrusiveness of the media in the cases of highly publicized acts of violence; this is especially true if the media repeatedly shows images of trauma and carnage associated with their loss.

The consequences of victimization can emerge in many forms (Wallace 2007). Physical consequences can include immediate injuries like cuts and bruises, as well as injuries that leave visible scars. Long-term catastrophic injuries are those that restrict movement and can impact one's identity, quality of life, and daily activities.

Financial costs associated with victimhood should not be overlooked. Both individuals and communities can suffer enormous economic hardships in the wake of a violent crime (Wallace 2007). Tangible losses for victims might include medical care, funeral arrangements, lost productivity, and travel expenses, among others. Costs to the community and public entities may include police services, victim services, volunteer time, expenses associated with tort claims, and the cost of enhanced security measures and psychological services. Immeasurable, intangible losses hurt both individuals and the community in the form of pain and suffering, diminished quality of life, and eroded institutional reputation.

Mental and emotional crises can be disabling. Crisis, according to Wallace, is "a specific set of temporary circumstances that results in a state of upset and disequilibrium, characterized by an individual's inability to cope with a particular situation using customary methods of problem solving" (2007). Crises can be broken down into a three-stage process. The impact stage, the phase immediately after a crime, is typically characterized by shock and disbelief. These and the associated feelings of exposure, vulnerability, and helplessness may last several hours to several days after a traumatic event and are often punctuated by intense mood swings. During the recoil stage, victims begin to accept the crime and "reintegrate their personalities." Emotions during this stage may include guilt, fear, anger, self-pity, or sadness. Victims may also have dreams related to the event and may feel the need to endlessly discuss the crime. For others, however, numbness or emotional detachment may follow; victims may feel this way because they are emotionally exhausted and need to rest and recover (Caplan 1964). During the third and final phase, the reorganization stage, the victim moves toward a more balanced state of feelings. This occurs over time and can vary widely from one person to another.

Distress and Theory

The combined effects of solidarity and sex on rates of distress and well-being in the Virginia Tech community has yet to be fully examined. Psychological distress, comprised of anxiety and depression, logically follows exposure to traumatic events. However, the stress

domain hypothesis posits that several different types of stressors exist (Wheaton 1999). Individuals vary in their distressed reactions to identical life events because a given event, no matter how large, represents only a portion of the stress each individual experiences. Furthermore, stress proliferation suggests that major stressors rarely exist in isolation (Pearlin 1999). Instead, traumatic stressors can set other stressors into motion. For example, job loss, a severe stressor, can also lead to social isolation and stigmatization. The individual outcome of a negative life event reflects the total cumulative stress associated with both the event and its aftermath.

Conservation of resources theory posits that people conserve the material, social, and psychological resources that they inherit or accumulate in order to preserve their mental health (Hobfoll et al. 1990). Resources deplete at faster rates than they accumulate (Wells, Hobfoll and Lavin 1999). Once resource loss begins, it tends to strengthen and accelerate. Ultimately, resource loss is the best predictor of mental health outcomes after mass-casualty events. Therefore, intervention must be rapid enough and have enough critical mass to offset the resource loss induced by the traumatic event.

Traumatic Stress Responses

Trauma can ignite one or more of many negative mental and emotional conditions (Bruce 1999; Figley 1985). Acute stress disorder (ASD) was first added to the Diagnostic and Statistical Manual of Mental Disorders (DSM) in the fourth edition, published in 1994, and is characterized by anxiety, dissociative symptoms, numbing, depersonalization, dissociative amnesia, and/or reduction in awareness of surroundings. To meet the diagnostic criteria, symptoms must emerge within one month of the event and must persist for at least two but no more than 30 days (First and Tasman 2004).

Post-traumatic stress disorder (PTSD) has been the subject of countless studies in recent years. PTSD is diagnosed as a certain response to a recognizable stressor (First and Tasman 2004). One who suffers from PTSD may re-experience the trauma through dreams, intrusive recollections, or flashbacks. He or she may also have symptoms of hyperalertness, sleep disturbance, guilt, memory impairment, inattentiveness, irritability, hypervigilance, or an exaggerated startle response. PTSD is considered acute if it lasts less than three months or

chronic if it lasts three months or longer. It may also be classified as delayed onset if the symptoms emerge six or more months after the initial stressor.

Long-term crisis reaction is a condition first identified by the National Organization for Victim Assistance (Wallace 2007). It is not listed in the DSM. This condition occurs when victims do not suffer from PTSD but may re-experience feelings of crisis when triggered by events associated with a trauma. These might include birthdays, anniversaries, significant life events, or media coverage of similar traumas. This response usually diminishes over time as the victim develops coping mechanisms.

Other psychological repercussions may afflict those who suffer from traumatic events. Acute stressors may trigger depression, substance abuse, eating disorders, obsessive-compulsive disorder, and dissociative disorders (First and Tasman 2004). Traumatic incident stress may affect those who respond to traumas, especially emergency personnel and volunteers (Wallace 2007). This was frequent in the case of Virginia Tech first responders, many of whom experienced compassion fatigue as the recovery progressed (Yoder 2008).

Types of Disaster and Mental Health

Disaster can be categorized into three major types: natural, technological, and intentional man-made disasters (Ursano and Norwood 2003). Of these, there is general agreement in the research community that the mental health consequences are most severe with intentional man-made disasters, followed by technological and then natural disasters. Other factors that affect mental health outcomes are the number injured and killed; the amount of property damage; the size of the geographic area involved; and the unexpectedness, duration, and recurrence of the trauma. Community response plays a vital role: conflict and criticism can lead to worse mental health outcomes (Johnes 2000), while supportive communities have lower rates of negative psychiatric health outcomes (North et al. 1989).

In the event of a trauma, negative mental health reactions are kept to a minimum when deaths and injuries are low, destruction and loss of property does not exceed the size and resources of the community, and social support systems remain functional (Norris et al. 2002). It is also important for mental well-being that the event does not take on symbolic meanings of human neglect or maliciousness.

On the other hand, psychological reactions are most severe when two or more of the following are present (Norris, Friedman and Watson 2002):

1. *Extreme and widespread damage to property*
2. *Serious and ongoing financial problems for the community*
3. *Human carelessness or, especially, human intent caused the disaster*
4. *High prevalence of trauma in the form of injuries, threat to life, and loss of life*

Increased risk for a negative reaction at the individual level is linked to a number of demographic and exposure variables. Severe exposure to the disaster and living in a traumatized community can increase the likelihood of experiencing additional emotional difficulties. Those who have little previous experience related to coping with trauma or disaster are at increased risk, as are those with weak or deteriorating psychosocial resources and those who face secondary stressors. Demographic predictors of distress include female sex, age between 40 and 60, ethnic minority status, and low socioeconomic status. Galea, Nandi, and Vlahov conducted an exhaustive review of the literature on man-made and technologically-induced disasters (2005) and found numerous strong links between distress and sex, race, social support, and various coping techniques.

Factors Impacting Distress after Disaster

Sex

Overwhelming evidence indicates that sex plays a key role in determining responses to trauma. In her analysis of the 1996 Detroit Area Survey of Traumas, which included a representative sample of 2,181 participants ages 18 to 45, Naomi Breslau found that the risk of post-traumatic stress disorder varied substantially by sex and the specific type of trauma (2009). The percentage of the sample experiencing the symptoms of PTSD after any trauma was 13.0 percent of women versus just 6.2 percent of men. When learning of traumas to others, 3.2 percent of women and 1.4 percent of men had these symptoms. After experiencing the sudden unexpected death of a friend or relative, 16.2 percent of women had PTSD symptoms, as opposed to 12.6 percent of men. The greatest contrast was in those who had faced assaultive violence; in these cases, 35.7 percent of women had symptoms while only 6.0 percent of men did.

Much of the research on sex and trauma refers to the September 11 terrorist attacks. In a sample of 77 individuals who had survived the attack at the Pentagon, women were more than five times as likely as men to have symptoms of PTSD and more than seven times as likely to have increased consumption of alcohol (Grieger, Fullerton and Ursano 2003). A separate survey conducted in the days after the attack, half of women versus 27 percent of men reported that they were experiencing substantial stress “quite a bit” or “extremely” (Schuster et al. 2001).

A phone survey of 988 residents of lower Manhattan five weeks after the attacks found that women were 2.2 times as likely to have symptoms of post-traumatic stress disorder. This decreased to 20 percent more likely when adjusting for confounding variables of previous trauma, psychological disorders, and social responsibilities (Pulcino et al. 2003), but this evidence denotes the increased psychological toll of stress on women. A similar study found that among New York City metro area survey participants, men were 3.37 times less likely than women to have symptoms of PTSD after the attacks. Men were also 2.9 times less likely than women to have clinically significant psychological distress symptoms (Schlenger et al. 2002).

The literature also provides insights on other man-made disasters. A study of 125 fishermen conducted after the 1989 Exxon Valdez spill found that 40 percent of women versus 34 percent of men experienced significant PTSD symptoms (Arata et al. 2000). A survey of 599 community members conducted one year later found that women exposed to the spill were significantly more susceptible than their male counterparts to experience psychological distress (Palinkas et al. 1993).

Likewise, data collected in the weeks after Hurricane Katrina found that 62 percent of those surveyed met the diagnostic criteria for acute stress disorder. Women were more than four times as likely to have these symptoms (Mills, Edmondson and Park 2007). The negative impacts of trauma on females are not limited to adults; children exposed to the 1972 Buffalo Creek dam collapse in Logan County, West Virginia were more likely to experience symptoms of PTSD two years later if they were female (Green et al. 1991).

Age

Age can also play an important role in healing, and the young are not at an advantage. In a study of 691 New York City residents after September 11, 2001, symptoms of PTSD were three times as common among those ages 45 to 59 and about four times as common in those ages 30 to 44 relative to those over age 60. PTSD prevalence was more than six times as high for the

youngest participants, those aged 18 to 29 (Schlenger et al. 2002). A different study after September 11 found that psychological resilience was very high in those aged 65 or older, with 79.5 percent of people in this age group experiencing zero or one symptom of PTSD. Meanwhile, only 62.2 percent of those aged 18 to 24 displayed such resilience. The only group that fared worse than young adults was those aged 25 to 34, among whom 57.7 percent experienced no more than one symptom of PTSD (Bonanno et al. 2006).

The literature review conducted by Norris, Friedman, Watson, Byrne, Diaz, and Kaniasty found that youth affected by disasters had much higher levels of very severe impairment (29.6 percent) than did adult survivors (18.3 percent), but that both groups had similar levels of moderate and severe impairment (Norris et al. 2002). A 1995 study of the 1989 Kegworth Air Disaster, the crash-landing of a British plane that left 47 dead, found that survivors were significantly more likely to suffer psychiatric distress if they were under 35 years of age (Gregg et al. 1995).

On the contrary, research examining the responses of immigrants who experienced the World Trade Center bombing found that distress was directly correlated with age at time of bombing. Older witnesses were more likely to experience distress than were their younger counterparts. However, the researchers also examined previous experience with trauma and found that distressed response was inversely correlated with age at previous traumatic events (Trautman et al. 2002).

Race and Ethnicity

In the general population, African-Americans and Asians report lower distress than whites (Brown et al. 1999). These lower rates result from acquired psychological coping resources and collective cultural values, or they may reflect underreported mental illness due to subcultural stigmatization. However, disasters may moderate the relationship between race and emotional distress.

The survey of psychological resilience among New York City residents after September 11 found that distress varied by race (Bonanno et al. 2006). The most resilience was found among Asians, of whom 82.3 percent reported one or fewer symptoms of post-traumatic stress. This level of resilience was reported among 67.8 of whites, 64.1 percent of African-Americans, 56.3 percent of Hispanics, and 53.2 percent of those of other races.

A survey of Australians and non-English-speaking immigrants after 1989 Newcastle earthquake found that ethnic minority status correlated with increased distress (Webster et al. 1995). Distress also correlated with ethnic minority status in the aftermath of the Exxon Valdez oil spill (Palinkas et al. 1993). As with gender, this variation in distress is not limited to adults; in a study of children and adolescents conducted nine months after an industrial fire at a factory in North Carolina, racial minorities experienced significantly more post-traumatic stress (March et al. 1997).

Exposure to Events

As the literature demonstrates, one of the most powerful predictors of traumatic distress is the level of exposure to the stressor. Schlenger et al.'s (2002) study found that those who were in the World Trade Center during the September 11 attacks were more than eight times more likely than those who were not present to have symptoms of post-traumatic stress one to two months later. The authors also found that physical proximity to the crash sites was also significantly associated with distress.

In a study of 85 survivors of the 1995 Oklahoma City bombing collected six months post-event, researchers found that physical injury significantly predicted PTSD symptoms (Tucker et al. 2000). Research on children from Oklahoma City collected seven weeks after the bombing found that PTSD symptoms were much more common in those who knew someone injured or killed than in those who did not. Furthermore, girls scored higher than boys on the distress scale, both for those directly exposed and for those not exposed to the attack (Pfefferbaum et al. 1999). Those who were exposed through other means were at higher risk of distress as well; among those children living outside Oklahoma City, indirect interpersonal exposure – knowing someone who lost a friend or family member – was tied to diminished well-being (Pfefferbaum et al. 2000).

Similar results were found for survivors and witnesses of other disasters, both big and small. In a study of 254 survivors examining the effects of bombings and attacks in France between 1982 and 1987, researchers found that symptoms of PTSD were present in 10.5 percent of uninjured, 8.3 percent of moderately injured, and 30.7 percent of severely injured victims. Major depression was found in 13.3 percent of victims but, interestingly, prevalence did not differ by level of injury (Abenhaim, Dab and Salmi 1992). A study of 389 childhood survivors of a train-bus crash found that, seven years after the incident, those who were most exposed to the crash had highest levels of somatization, anxiety, depression, and more PTSD symptoms (Tyano

et al. 1996). And in the previously noted study of community members who experienced the repercussions of the Exxon Valdez spill, those who were most exposed to the spill were at the most risk of distress. Compared to unexposed group, high-exposure group members were 3.6 times as likely to have generalized anxiety disorder and 2.9 times as likely to have PTSD at one year after the spill (Palinkas et al. 1993).

Emergency workers, who often witness the grimmest aspects of disaster, are not immune to this emotional trauma. In a survey of 79 emergency personnel responding to apartment explosion, more than four-fifths had at least one symptom of post-traumatic stress. Furthermore, those who responded on the scene had more symptoms than in-hospital staff (Durham, McCammon and Allison 1985). Similarly, interviews of 13 responders to the 1998 Swissair 111 crash uncovered that coping-related drinking was linked to severity and frequency of traumatic stress symptoms. However, exposure to human remains during the response process was not correlated to drinking (Stewart et al. 2004).

Sprang (2000) points out that, interestingly, many of those closest to an disaster will not seek out mental health services because they do not believe they need help, despite being severely emotionally distressed.

Media Exposure

The ubiquity of information technology in American households adds an additional layer of exposure to traumatic events and makes them visible from thousands of miles away. Much research in recent years has explored the role of media exposure on distress and well-being. In particular, a great deal of this analysis focused on September 11 and Oklahoma City, both of which were widely televised.

Research from September 11 provides a link between media exposure and distress. Schlenger et al's (2002) study found that media exposure correlated with psychological distress. Psychological distress was estimated in 7.5 percent of participants who watched less than four hours of television per day, 9.4 percent of those who watched four to seven hours per day, 15.6 percent of those who watched eight to 11 hour per day, and 18.0 percent of those who watched 12 or more hours per day. Prevalence of distress rose with increased viewing of graphic September 11 imagery.

A similar survey of 1008 residents of lower Manhattan taken one to two months after the terrorist attacks found that those who repeatedly saw "people falling or jumping from the towers

of the World Trade Center" had higher rates of PTSD and depression. Those directly affected by the attacks who viewed this image frequently were more likely to have PTSD or depression than those who did not view it. For those not directly affected, however, television image frequency was not associated with distress (Ahern et al. 2002). Media exposure was a source of fear for parents after the events; in a nationwide sample of 560 adults conducted after the attacks, a third of parents indicated that they restricted television viewing by their children (Schuster et al. 2001).

Research out of Oklahoma City provides similar results. For middle and high school students in Oklahoma City seven weeks after the bombing, the amount of television coverage they watched that related to the bombing correlated directly with symptoms of distress (Pfefferbaum et al. 1999). Likewise, the study of sixth grade students who lived within 100 miles of the Alfred P. Murrah building but were not directly exposed concluded that distressed symptomatology directly correlated with increased media exposure (Pfefferbaum et al. 2000).

Social Support

Social support is vital in effective recovery from traumatic events. Low social support has been tied to negative psychological outcomes in a number of disaster studies. For example, a study of 77 survivors of courthouse shooting spree assessed at 6 to 8 weeks and three years determined that low social support correlated with diminished well-being (Johnson, North and Smith 2002). Social support is also significant for emergency response workers. An analysis of distress in EMS workers who responded to the I-880 bridge collapse after the 1989 Bay Area earthquake found that low social support was related to most symptoms of distress (Weiss et al. 1995). Likewise, among forensic dentists responding to Waco, psychological distress correlated inversely with social support (McCarroll et al. 1996).

Low social support may come in the form of poor personal relationships, some of which may erode in the wake of traumatic stressors while others may have been poor prior to the event. After the Buffalo Creek dam failure and subsequent flood, later PTSD in children was linked to dysfunctional, depressed, or irritable family atmosphere (Green et al. 1991). Negatively-changing relationships with friends and family corresponded to higher rates of PTSD, depression, and anxiety in community members after the Exxon Valdez spill (Arata et al. 2000). The Oklahoma City bombing may have had a particularly negative effect on the personal lives of first responders; for firefighters who responded to the attack, divorce rates increased

substantially in the three years after the event. Though 19 percent reported that their relationships changed for the negative, another 20 percent reported that their relationships changing for the positive. Those who experienced a decreased quality in their personal relationships were at a heightened risk of developing PTSD (North et al. 2002).

Coping Strategies

How people cope matters. Methods of coping, however, are not always obvious. Arata et al. (2000) found that after Exxon Valdez, both social containment/passivity and social expressiveness/support seeking correlated with PTSD, anxiety, and depression. However, negative outcomes correlated with containment more than twice as frequently as with expressiveness. This is consistent with Conservation of Resources Theory (Arata et al. 2000). Interestingly, seeking social support and positively reappraising events corresponded with more distress among Hurricane Andrew emergency dispatchers, but social involvement correlated with less distress (Jenkins 1997). This research provides few easy answers regarding responses to trauma.

In terms of specific methods of coping, a previously mentioned survey conducted in the three to five days after September 11, 2001 sheds some light on the types of responses people used (Schuster et al. 2001). This nationwide sample of 560 adults who did not directly witness the attacks found that some of the most common coping strategies were talking to others (98 percent), turning to religion (90 percent), participating in group activities related to the attacks (60 percent), making donations or volunteering (36 percent), and talking to their children about the attacks for an hour or more (84 percent).

Time

Ultimately, time may play one of the biggest roles in the healing process. A 1994 study of 105 victims of violent crimes, 227 victims of property crimes, and 190 non-victims in Kentucky assessed depression, somatization, hostility, anxiety, fear of crime, phobic anxiety, and avoidance behavior at three, nine, and 15 months post-crime (Norris and Kaniasty 1994). The authors found great improvements in well-being between three and nine months, but little improvement after nine months. Significantly, they also found that violent crime victims exhibited greater distress than property crime victims.

As this research and theoretical background indicates, distressed reactions to acute traumatic events result from cumulative strain and the degree to which coping resources mediate the severity of the stressor. However, the existing research does not appear to include analyses of the interaction between solidarity and sex as it pertains to later recovery. This gap in the literature leaves questions about the effectiveness of community efforts to provide for the maximum healing of the community.

The current study aims to explain how solidarity and sex interacted after the Virginia Tech shootings inform well-being nine months after the event. Did women and men experience solidarity differently? Did their experiences of solidarity have disparate impacts on well-being at later times? This study will use data from the 2007 survey by Hawdon and Ryan, as well as a subsequent wave of data collection, to answer these questions.

Chapter 3: Methodology

Hypotheses

Bivariate

The literature confirms the significance of sex in trauma recovery success. I hypothesize that, relative to men, women will experience lower well-being. I also expect that identifying as a minority race will be a negative predictor of well-being when compared to whites.

A fair amount of research on age finds that young people often fare worse than their elders after traumatic stressors. Additional research found an inverse correlation between distress and age during previous experience with trauma (Trautman et al. 2002). This finding may hold particular relevance in the case of the Virginia Tech, where all students in 2007 were old enough to have recalled the Columbine High School shootings and the September 11 attacks. Older students would have logically been older during these previous disasters; the findings of Trautman et al. might suggest that these older students may have stronger coping abilities after the Virginia Tech shootings. Therefore, I anticipate that age will positively predict well-being.

In accordance with Johnson and Hobfoll's model of distressed responses to terrorism (2010), exposure to the shootings should correlate positively with distress and negatively with well-being. I expect to find that those who knew victims personally demonstrated significantly lower well-being at nine months than those who did not know any victims. I also anticipate that those who watched a great deal of news media experienced diminished well-being relative to those who did not.

The literature points to the significance of social support in times of crisis. I predict that frequency of conversations with friends and family will positively predict well-being at nine months. However, I do not predict this to be the case with counselors. I anticipate that those who sought out counseling were more affected by the shootings in some way, either proximally or emotionally. Therefore, I hypothesize that those who sought counseling will have decreased well-being relative to those who did not. Similarly, I expect to find that frequency of media conversations will be a negative predictor of later well-being, as those who were contacted heavily for interviews are likely to be those who were closer to the attack in some capacity.

Hypothesis 1

Women will have lower well-being than men.

Hypothesis 2

Racial minorities will have lower well-being than whites.

Hypothesis 3

Age will positively predict well-being.

Hypothesis 4

Extent of exposure to the shootings will predict negative well-being.

Hypothesis 5

Levels of social support from family and friends will positively predict well-being.

Hypothesis 6

Frequency of conversations with both media and counselors will predict diminished well-being.

Multivariate

Conservation of resources theory indicates that individuals conserve the available material, social, and psychological resources so that they may preserve their mental health (Hobfoll et al. 1990). These resources are important predictors of distress after exposure to terrorism and other similar events (Johnson and Hobfoll 2010). Because resources deplete rapidly (Wells, Hobfoll and Lavin 1999), the extent of resources available and the speed at which they are made available should correlate with their success at offsetting the resource loss associated with a trauma.

As discussed in the literature review, social solidarity may be viewed as a resource. However, this resource may be of decreased value to women relative to men, and may in fact be a burden because of the pressure they face to assume emotional caretaking roles. Pearlin's stress proliferation model (1999) indicates that the outcome of a negative life event reflects the combination of stress associated with the event itself and that associated with the aftermath. Therefore, women with high levels of solidarity should face more challenges to recovery than similar men, because they are forced to deal with the additional burden of supporting their extensive social networks.

Hypothesis 7

Solidarity will be a positive predictor of later well-being for both men and women, but it will be a stronger predictor for men.

The literature indicates that access to and use of resources play vital roles in determining post-trauma outcomes. The model of distressed responses to terrorism points to the impact of sociodemographics, resources, and exposure on emotional distress. Each of the hypotheses in this study reflects one or more of these determinants. Conservation of resources theory indicates that the quality of resource management after trauma shapes emotional outcomes during stressors. If my hypotheses are confirmed, these two theories will serve as strong explanations of my results.

These hypotheses will be analyzed using a number of variables found in a 2007 survey designed by James Hawdon and John Ryan that was administered to a sample of students, faculty, and staff in the months after the shootings. This analysis will be limited to only the student respondents of that survey.

Measures

Outcome Variable

Researchers often measure distress using indexes indicating the frequency with an individual experiences depression, anxiety, and anger (Mirowsky and Ross 1995). These indexes often include subjective measures of affect and more objective measures of physiological stress indicators, such as changes in sleeping or eating behaviors. Situated at the opposite end of the stress continuum from distress, psychological well-being is defined as “a general sense of enjoying life and feeling happy, hopeful about the future, secure, and calm” (Ross and Mirowsky 2003). Because they are opposites, positive well-being reflects the absence of psychological distress. In this study, **well-being at Time 2** is the outcome variable of interest.

In order to measure well-being, I created an index based on six questions from the second wave of data collection. Relevant questions denote the extent to which the respondent (1) feels very sad; (2) feels grouchy, irritable, or in a bad mood; (3) feels like not eating or overeating; (4) has difficulty sleeping; (5) has difficulty concentrating on his/her work; and (6) feels like he/she is less productive than desired. The respondent ranked the frequency with which he or she experienced these items; possible responses were never, rarely, sometimes, or often. I reverse-coded and summed the composite scores for each of these items into a well-being index. Possible well-being index scores range from 0 to 18, with 18 representing the best possible overall well-being.

Independent Variables

Because the literature has demonstrated the strong correlation between sex and diminished well-being, I am interested in determining the differential effects of solidarity by sex. The results may indicate the degree to which women and men experience solidarity and how sex interacts with solidarity to produce well-being. **Sex** will include male and female.

An additional variable will address attitudinal **solidarity at Time 1**. In order to measure this, I will develop an index variable composed of responses to six questions. These questions measure the extent to which the respondent (1) trusts Virginia Tech students; (2) trusts Virginia Tech faculty; (3) trusts Virginia Tech staff; (4) feels like he/she is a part of the Virginia Tech community; (5) feels like he/she shares the same values as other members of the Virginia Tech community; and (6) is proud to be a member of the Virginia Tech community. These variables are evaluated on five-item Likert-type scales ranging from “strongly disagree” to “strongly agree.” Possible solidarity index scores will range from 0 to 30, with 30 representing the highest possible level of attitudinal solidarity.

Controls

The literature demonstrates the significant impacts of demographics, social support, and exposure to trauma on well-being after trauma. As such, the multivariate analysis will control for the effects of these factors. Demographic control variables will include **age** and **race**. Social support variables will include the frequency with which participants **talked to friends** and **talked to family members** in the week after the shootings. Exposure variables will include whether the participants **knew any victims** of the shootings and the **amount of news** they watched on television. Other variables linked to exposure will include whether the participants **talked to a counselor** or **talked to the media**, as those who did so were likely proximally closer to the events.

Survey

The current study uses data from a 2007 survey designed by sociology professors John Ryan and James Hawdon and collected by the Virginia Tech Center for Survey Research. This survey contained questions about community responses to the events of April 16 and was conducted in waves at five, nine, and 13 months after the shootings. The National Science Foundation funded this study with the goal of increasing understanding of social solidarity after tragedy.

Though the researchers originally hoped to survey the entire Virginia Tech population, the university restricted this possibility due to concerns about having students complete excessive surveys and to fears about possible litigation brought forth by victims or their family members. Under guidelines determined by a university-appointed committee, which capped the number of students that could be contacted for participation in any study, the Virginia Tech Center for Survey Research randomly selected 2000 undergraduates who were present at the Blacksburg campus during fall 2007.

The first wave of the survey was distributed to a sample of 2000 students on August 25, 2007 and was completed on October 1, 2007. This wave garnered 626 responses for a response rate of 31.3 percent. Researchers contacted first-wave participants about five months later for the second wave of data collection, which took place between January 12, 2008 and February 10, 2008. Of the 626 students who completed the first wave survey, 478 continued on to the second wave for a response rate of 76.4 percent. It is important to note that this response rate was negatively affected by graduation – about 26 percent of students sampled in wave one left the university between the fall 2007 and spring 2008 semesters, so many were no longer students by the time the second wave of data collection began. The current analysis is limited to the 478 students who completed the first and second waves of the survey.

This survey was approved by the Institutional Review Board for Research Involving Human Subjects of Virginia Polytechnic Institute and State University (Virginia Tech), and also by the Department of Sociology. Prospective respondents were warned that risks associated with participation might include emotional discomfort, distress, or agitation. They were told that they could stop answering questions at any point and that survey administrators could direct them to the appropriate support resources if needed. They were also informed that, because they were participating in a longitudinal study, they might be contacted four months later for the subsequent wave of data collection. As such, respondents were assigned identification numbers, which were linked to their contact information. This information was protected under lock and key by the Virginia Tech Center for Survey Research and is not visible in the data set. Participation in later surveys was also entirely voluntary. Researchers provided no compensation, financial or otherwise, for participation in this survey.

Analytical approach

All analysis were conducted using the Statistical Package for the Social Sciences (SPSS) version 19.0. Univariate data are presented for all variables, including well-being, solidarity, sex, and all control variables. These data provide contextual information about the sample itself, indicating demographics of the sample as well as the mean participation in the responses that are being addressed. I also tested for Pearson's correlations between well-being and all control variables. These tests shed light on the significance of the relationships between well-being and each independent variable.

I measured multivariate relationships using ordinary least squares (OLS) regression. I tested for an interaction effect between sex and solidarity regressed upon well-being. Multivariate analysis helps document the collective effects of variables on overall well-being and produces explanatory power that detail the interactive effects of solidarity and sex on the outcome variable. It also helps to glean out any spurious relationships in my analysis (Sweet and Grace-Martin 2008).

Limitations

This proposed study faces several limitations. First, I had to recode race into a dichotomous variable that included "white" and "non-white." While this situation was not ideal, it was ultimately necessary because of the relative homogeneity of the Virginia Tech population. Second, the survey did not account for multiple levels of exposure. No variables in the data set account for whether the participant was in Norris Hall or West Ambler Johnston, the sites of the shootings, on the day of the attack. They do not indicate whether the respondent directly witnessed the attacks in any way, whether they were on campus, or whether they experienced the lockdown that followed the shootings. The variable used in this study referring to secondary victimization does not denote the closeness of the relationship between the respondent and the victim; one might predict that the death of a sibling or close friend might result in more distress than the death of a casual acquaintance or classmate. Furthermore, the survey does not specify the degree of victimization, such as whether the known victim was killed or slightly injured.

Third, no data exists to assess the well-being of respondents before the shootings occurred. This made it impossible to determine pre-existing mental health concerns. Finally, none of the available data assess the size of social networks. Though two control variables

address the frequency with which the respondent received social support from friends and family, it provides no information on the number of contacts the individual has. This information would have been useful in providing a more detailed analysis of the burden and support of social networks on participants.

Chapter 4: Results

Univariate

Descriptive statistics can be found in *Table A-1*. The mean well-being of students at Time 2, nine months after the shootings, was 8.437 on a scale from 0 to 18. Solidarity scores at Time 1, four months after the shootings, averaged 27.6 out of 30, with a minimum score of 15.

Like the total Virginia Tech population, the sample was relatively racially homogenous; among respondents, 88.7 percent were white and 11.3 percent were non-white. The mean age of respondents was 22.3 years. However, 60.0 percent of those surveyed were female, while only 41.6 percent of the undergraduate population at that time was female (Hawdon and Ryan 2011).

In terms of exposure, nearly half (47.0 percent) of respondents indicated that they personally knew at least one victim of the shootings. The mean news exposure was 2.71, signifying that respondents typically watched more than two hours of local news coverage almost every day in the week after the shootings. The vast majority (87.7 percent) of individuals had no meetings with counselors in the week following the attack, and none had more than 2-4 meetings. Likewise, most respondents (62.6 percent) had no conversations with the media that week, and the majority of the remainder had only one or two conversations.

Variables demonstrate high levels of social support, especially from friends. The mean response denoted one or more conversations with friends every day in the week after the shootings, and conversations with family between 2-4 times and every day that week.

Bivariate

Bivariate correlations, found in *Table A-2*, signal significant relationships between well-being at Time 2 and the independent variables of interest. The relationship between female sex and well-being was negative ($r = -.135$, $p=.003$) which suggests that, overall, women fared worse than men nine months after the shootings. Similarly, conversations with media ($r=-.116$, $p=.013$) and counselors ($r=-.097$, $p=.037$) were negative and significant but weak predictors of well-being.

Of all significant factors analyzed, the strongest predictor of well-being was whether the respondent personally knew any victims of the shootings. Knowing victims negatively predicted well-being ($r=-.200$, $p=.000$). The other exposure variable, frequency of news watching, was weakly significant but operated in the opposite direction hypothesized ($r=.080$, $p=.085$).

Ultimately, solidarity at Time 1 was a moderate predictor of well-being at Time 2, and the correlation was positive and significant ($r=.197$, $p=.000$). Age, race, and social support variables did not significantly predict well-being at Time 2.

Multivariate

The multivariate analysis is divided across three models, as displayed in *Table A-3*. The first model includes data on the controls, which include age, race, social support, and exposure variables. The baseline for comparison in the first model is whites at zero years of age who did not talk to family, friends, counselors, or the media; did not personally know any victims; and did not watch any news in the week after the shootings. In the first model, those who knew victims could be expected to experience a drop of 1.244 points in well-being at Time 2 ($p=.002$), independent of the other control variables. Each unit increase in talking to the media in the week after the shootings also predicted a drop of .538 points in well-being at Time 2 ($p=.025$).

The second model adds sex and solidarity to the variables from the first model. In this model, knowing any victims remains a negative predictor of well-being at nine months, but the strength of this relationship diminishes to -1.170 ($p=.003$) from -1.244 in model 1. Conversely, the negative relationship of talking to the media strengthened to $-.552$ from $-.583$ in model 1. The significance of this variable increased to $p=.020$.

These shifts in strength in model 2 are attributed to the added variables: sex and solidarity at Time 1. Being female predicted .765-unit drop in well-being; this approached significance at the .05 level ($p=.061$). Meanwhile, solidarity at Time 1 predicted a positive gain of .205 units of well-being ($p=.005$).

The third and final model contains all previous variables and incorporates an interaction between solidarity and female sex. As in the first two models, knowing any victims predicted lowered well-being. The strength of this relationship dropped across all models with the addition of new variables; in the third variable, knowing victims predicted a diminished well-being of 1.161 units ($p=.003$). The negative predictive power of talking to the media on well-being strengthened to $-.596$ for each step up in contact frequency.

The addition of the solidarity*female interaction variable moderated the female variable and made it insignificant. It elevated the positive predictive power of solidarity such that, for every unit increase in solidarity at Time 1, well-being increased .337 units at Time 2 ($p=.002$).

The interaction between solidarity and female sex was $-.237$, which was significant under a one-tailed test ($p=.099$). This interaction is compared to the reference group for the third model, of which being male was a criterion. As such, the coefficient of $-.237$ for solidarity*female refers the solidarity levels of women relative to the unstandardized coefficient of $.337$ for the solidarity variable, which refers to solidarity of men only, since they are the baseline reference group. Therefore, when we measure solidarity*female against solidarity, this indicates that the unstandardized coefficient for solidarity in women is $.100$. That is, every unit increase in solidarity for women predicts a $.100$ -unit increase in well-being at Time 2. By comparison, every unit increase in solidarity for men predicts a $.337$ -unit increase in well-being at Time 2.

The adjusted R-square of $.100$ for the third model indicates that all variables, including controls, account for 10.0 percent of the variance in well-being at Time 2 ($p=.000$). Without controls, sex, solidarity, and the interaction term accounts for 3.9 percent of the variance in well-being.

Chapter 5: Conclusions

The bivariate data confirm that, as hypothesized, women experienced greater distress than men nine months after the shootings at Virginia Tech. Likewise, the second regression model demonstrates the independent and negative effects of female sex on well-being. This was anticipated based on the extensive literature on sex and mental health, both in general and after traumatic stressors.

Also as expected, exposure to the mass-murder predicted lower well-being nine months of the shootings. In particular, personally knowing victims played a key role in psychological outcomes. Knowing victims was a negative and significant predictor of well-being across all models. Johnson and Hobfoll's (2010) model of distressed responses to terrorism points to exposure specifically as being a significant determinant of post-traumatic distress, which is confirmed by these findings. In the first and second models, beta-values demonstrate that knowing victims was the most powerful predictor of lowered well-being among all independent variables. This relationship weakened as sex, solidarity, and the interaction term were added to the analysis. Solidarity may have moderated some of the effects of knowing victims. In addition, the decreased impact of knowing victims in the second and third models refers to men, the reference group, as the effects of being female were separated. Well-being of women may have been even more severely diminished by knowing victims than did that of men.

However, indirect exposure via the media did not operate accordingly. The bivariate data revealed a *positive* relationship between frequency of news watching that approached significance. This would suggest that those who watched more local news actually experienced better mental health outcomes than those who watched less. However, this association vanished when analyzed independently in the multivariate analysis.

The bivariate data demonstrate that frequency of conversations with the media and with counselors significantly predict negative psychological outcomes. The relationship between talking to a counselor and well-being disappeared in the multivariate analysis, and may have been moderated by other variables such as knowing victims. Talking to the media remained a negative and significant predictor of well-being in the multivariate analysis, however, and increased in strength as more variables were added. This relationship might be the result of one or more factors. First, speaking to the media may have direct detrimental effects on mental health independent of exposure to knowing victims. Second, conversations with the media may have

served as a proxy for other types of exposure to the shootings. Those who engaged in these interactions may have had some particular ties, even beyond knowing victims, that explained their diminished well-being. For example, they may have been interviewed by the media because they lived in the dormitory where the first shooting took place or heard the Norris Hall shootings from outside the building.

Solidarity positively and significantly predicted well-being as stated in my hypotheses. This confirms the literature and supports the theoretical perspective that solidarity serves as a resource within Johnson and Hobfoll's (2010) model of distressed responses to terrorism. This supports the notion that solidarity functions as a means of conserving psychological resources, and demonstrates that the quality of such resource management shaped mental health outcomes after the Virginia Tech shootings. Those who experienced higher solidarity at Time 1 were ultimately less distressed at Time 2.

Assuming the interaction is significant, the interaction variable verifies that solidarity functions differently for men than for women. While solidarity positively and significantly predicted well-being for both sexes, it had a stronger effect for males. In fact, solidarity positively predicted well-being three times better for men than for women. For each unit increase in solidarity at Time 1, men gained .337 units of well-being at Time 2 relative to just .100 units for women. This meets a one-tail test of significance and confirms the hypothesis that solidarity was stronger predictor of well-being for men than for women. This may operate through the avenues previously hypothesized: while solidarity contributes to well-being, women may face additional burdens after trauma that are placed on them by the size and strength of their social support networks.

As discussed in the literature review, women tend to engage in more caretaking than do men after such tragedies, and this strain may negate much of the positive benefit they receive from social solidarity. Among those examined in other tragedies, however, women tended to face concrete family caretaking responsibilities; by comparison, most undergraduate women at Virginia Tech were unmarried and did not have childrearing tasks. They did not necessarily face the same material responsibilities as females during other similar tragedies. What then accounts for this diminished well-being relative to men? Further bivariate analysis of the data shows significant and positive relationships between female sex and frequency of conversations with family ($r=.122$, $p=.002$), and frequency of conversations with friends ($r=.085$, $p=.030$). This

support the conclusion that emotional labor performed by women accounts for the decreased benefits of solidarity on well-being relative to men.

Conservation of resources theory suggests that, once resource loss begins, it accelerates and accumulates. The results of this thesis support the theoretical framework that emotional caretaking precipitates resource loss in women, which is amplified by the strong social networks tied to social solidarity. Women derive fewer benefits of social solidarity than do men because of the resource loss it initiates.

While many of my hypotheses were correct, several were not. Contrary to expectations, age and being a racial minority were unrelated to well-being in both bivariate and multivariate analysis. Most surprisingly, social support, as measured by conversations with family and friends, had no predictive power in these analyses.

Suggestions for Victimized Communities

This research reveals several suggestions for future communities impacted by large-scale acute traumatic stressors. Affected populations, especially those who know victims or are otherwise exposed to a traumatic event, should be the focus of additional support and assistance. The findings also suggest that limiting the access of the media to these groups may also contribute to enhanced healing.

This study points out the importance of providing sufficient support so that the responsibility of communal recovery does not fall entirely on individuals. The burden of caretaking is often distributed unevenly across the social structure and tends to fall on women. Therefore, responders and policymakers should encourage affected populations, especially women, to get the help they need. Support could be targeted at entire groups in order to reduce the strain placed by social networks. For example, interventions after a similar event at a university could focus on social clubs, Greek organizations, and dormitory halls. This would reduce stress on individuals within those organizations.

The results indicate the significance of attitudinal solidarity in helping individuals heal. As such, policymakers should consider encouraging solidarity through activities and events aimed at producing feelings of trust, membership, pride, and shared values among community members. Because solidarity in this case relief on feelings of trust that extended to students,

faculty, and staff alike, first responders may be well-served by incorporating all levels of community membership into these displays.

As Hawdon and Ryan (2011) note, solidarity is likely to emerge when the collective defines the tragedy as one that affects the collective and that interrupts the routine of daily life, and when the collective is defined as moral and is not seen as a willing participant in the tragedy. While this may provide an effective perspective for framing events and shaping the dialogue after a traumatic stressor, it may also have troubling consequences if used inappropriately. Though solidarity predicts effective healing after tragedy, overzealous unity has the potential to stifle introspection and openness to dissenting perspectives.

Areas for Future Research

The findings of this research encourage several new directions for exploration. First, what specifically links conversations with the media to diminished well-being? Are the conversations themselves harmful, or is it a spurious relationship caused by other factors? Second, knowing victims and solidarity were the two most significant predictors of well-being. However, solidarity may have functioned differently for individuals experiencing different levels of victimization. Did primary and secondary victims experience solidarity at the same rates and in the same ways as did other community members? In what directions did those variables interact? Finally, this research notes the importance of attitudinal solidarity, but does not provide insight into the mechanisms through which solidarity originates. Did feelings of trust and community membership emerge from individual-level interactions and conversations, or did they develop during community-wide events like the convocation and the candlelight vigil?

The answers to these questions will provide future first-responders and policymakers with more concrete solutions to aid community recovery. This study and those it may encourage ultimately provide new directions and perspectives for understanding how communities heal from devastation.

Appendices

Appendix A: Tables

Table A-1: Descriptive Statistics

Well-being at Time 2	0	18	8.4371	3.01258
Solidarity at Time 1	15	30	27.6144	2.78067
Female	0	1	0.5996	0.4905
Age	19	56	22.3178	4.35094
Racial minority	0	1	0.113	0.31694
Talk to family	0	4	2.7019	1.51973
Talk to friends	0	4	3.5959	0.91019
Know victims	0	1	0.47	0.499
Watch the news	0	4	2.7097	1.42411
Talk to counselor	0	2	0.1295	0.3546
Talk to media	0	4	0.4989	0.75072

Table A-2: Bivariate Correlations with Well-Being at Time 2

	Correlation	Sig.
Well-being at Time 2	1	
Age	0.074	0.112
Racial minority	-0.060	0.193
Talk to family	0.061	0.274
Talk to friends	0.045	0.378
Know victims	-.200**	0.000
Watch the news	0.080	0.085
Talk to counselor	-.097*	0.037
Talk to media	-.116*	0.013
Female	-.135**	0.003
Solidarity Time 1	.197**	0.000

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table A-3: Independent Variables Regressed Upon Well-Being

	Model 1	Sig.	Model 2	Sig.	Model 3	Sig.
Constant	7.204	0.000	1.974	0.381	-1.345	0.655
Age	0.045	0.270	0.054	0.185	0.049	0.226
Racial minority	-0.578	0.332	-0.478	0.415	-0.400	0.495
Talk to family	0.058	0.657	-0.003	0.981	0.025	0.853
Talk to friends	0.245	0.233	0.202	0.324	0.147	0.475
Know victims	-1.244	0.002	-1.170	0.003	-1.161	0.003
Watch the news	0.032	0.819	0.082	0.559	0.082	0.558
Talk to counselor	-0.295	0.564	-0.240	0.633	-0.308	0.540
Talk to media	-0.538	0.025	-0.552	0.020	-0.596	0.012
Female			-0.765	0.061	5.715	0.148
Solidarity Time 1			0.205	0.005	0.337	0.002
Solidarity*Female					-0.237	0.099
Sig.	0.003		0.000		0.000	
R-Square	0.091		0.129		0.139	
Adj. R-Square	0.061		0.094		0.100	
Std. Error	3.00893		2.95708		2.94659	

Appendix B: Approval Letter from the Institutional Review Board



VirginiaTech

Office of Research Compliance
Institutional Review Board
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MEMORANDUM

DATE: May 9, 2011

TO: John W. Ryan, James Hawdon, Lindsey Aitcheson

FROM: Virginia Tech Institutional Review Board (FWA00000572, expires October 26, 2013)

PROTOCOL TITLE: Community Solidarity after the Virginia Tech Shootings

IRB NUMBER: 11-453

Effective April 25, 2011, the Virginia Tech IRB Chair, Dr. David M. Moore, approved the new protocol for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at <http://www.irb.vt.edu/pages/responsibilities.htm> (please review before the commencement of your research).

PROTOCOL INFORMATION:

Approved as: **Exempt, under 45 CFR 46.101(b) category(ies) 4**

Protocol Approval Date: **4/25/2011**

Protocol Expiration Date: **NA**

Continuing Review Due Date*: **NA**

*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

FEDERALLY FUNDED RESEARCH REQUIREMENTS:

Per federal regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals / work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

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Date*	OSP Number	Sponsor	Grant Comparison Conducted?

*Date this proposal number was compared, assessed as not requiring comparison, or comparison information was revised.

If this IRB protocol is to cover any other grant proposals, please contact the IRB office (irbadmin@vt.edu) immediately.

cc: File

Appendix C: Approval Letter from the Committee for Assessment and Research after the Tragedy



Senior Vice President and Provost
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April 28, 2011

Lindsey Reed Aitcheson
Jim Hawdon, Ph.D.
John Ryan, Ph.D.
Department of Sociology
Campus 0137

Dear Ms. Anderson, Dr. Hawdon, and Dr. Ryan:

The Committee for Assessment and Research after the Tragedy has reviewed your research proposal, "Community Solidarity after the Virginia Tech Shootings" (IRB # 11-453), and has recommended approval for your project and I concur. You may proceed with your research when you have final approval from the Institutional Review Board.

I wish you success with your project.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark G. McNamee".

Mark G. McNamee
Senior Vice President and Provost

cc: David Moore, Chair, IRB
CART members

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