



Edited by

Laura C. Wilson

THE WILEY HANDBOOK OF

*The Psychology of
Mass Shootings*

WILEY Blackwell

The Wiley Handbook of the Psychology of Mass Shootings

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Preface

I am often asked, “What led you to study mass shootings?” The answer is simple: “I am a Virginia Tech Hokie.” With this response, most people instantly understand my connection to the topic. I am a psychologist with expertise in trauma, who also happens to be a proud graduate of the close-knit community of Virginia Tech located in Blacksburg, Virginia. The university is well known for its academic excellence, football team, unique school colors, and beautiful campus. In April 2007, it also became known for one of the deadliest shootings by a single perpetrator on U.S. soil. I, like so many impacted individuals, was left asking questions: “Why did this happen? Why did the shooter open fire on innocent victims? How do we help those affected by the shooting? How do we prevent the next shooting?” It is these questions, and dozens more, that drive this line of research.

At the time of publication, this book was the only known psychology reference work dedicated exclusively to the study of mass shootings. This may come as a surprise given the immense media and political attention mass shootings have received in the past 15 years. However, one thing that is apparent across the chapters in this volume is that mass shootings are an underresearched area within the field of psychology. This book contains the available empirical evidence, as presented by the foremost authorities in the field, to inform the reader on our current knowledge-base and identify gaps in the literature to guide future studies.

The chapters in this book are topically broad, and the contributors represent numerous fields (e.g., communication, criminal justice, criminology, psychiatry, psychology, sociology) and countries (e.g., Finland, Norway, United States). The material is presented in six sections. The first section, “Background on Mass Shootings,” introduces the topic by identifying many of the challenges associated with this area of study, the prevalence and key features of such incidents, and explanations for mass shootings. The second section, “The Psychology of Perpetrators,” discusses developmental and psychobiological features of mass shooters, and issues related to predicting dangerousness. The next section, “The Role of Media in the Aftermath of Mass Shootings,” focuses

on media as a means of influencing the public, a form of exposure, a medium for grief, and potential source of stress for grieving communities. The fourth section, “Psychological Considerations for Impacted Individuals,” covers the wide range of individuals who are affected by mass shootings and details issues related to psychopathology. The fifth section, “Clinical Interventions for Impacted Individuals,” includes information related to individual- and community-level clinical response, barriers to care for survivors, and resiliency and posttraumatic growth in the aftermath of mass shootings. The final section, “Prevention, Ethics, and Future Directions,” covers a range of topics related to assessing for and reducing violence, conducting ethical research, and considerations for future directions.

There are a few additional comments that are necessary to properly orient the reader to this book. First, for the purpose of consistency, a mass shooting is defined in this book as an incident in which a gun was used to kill four or more victims. This definition was chosen because it is the most commonly used in the field and identifies boundaries for the material to be covered within this book. I acknowledge that this definition is controversial and flawed, specifically because of the restrictions on the number of victims and type of weapon. This will be further discussed in the first section of this volume. Second, although this book presents a breadth of information from a wide range of perspectives, the one thing that will not appear among these pages is the names of the shooters who have perpetrated mass shooting incidents. I made this request so that this book does not contribute to the notoriety that many shooters seek. Third, the contributors and I would like to acknowledge those who have participated in the research that made this reference book possible. In the aftermath of tragedy, many members of impacted communities have volunteered to share their stories in order to assist us in furthering our understanding of these incidents and improving the support we can provide to impacted individuals in the future. We thank you!

This book is being published at a time when society is demanding answers to how to predict mass killings and there is a heated debate about how to reduce gun violence. The violent nature of mass shootings elicits visceral and emotional responses from society, and empirically based knowledge and recommendations are often overlooked. In order to identify and enact best practices before, during, and after mass shootings, science must play a central role. I encourage policy makers to seek consultation from researchers who can offer guidance on science-driven policies and legislation. I urge researchers to conduct high-quality research (e.g., diverse samples and events, longitudinal designs) on this understudied topic, disseminate findings, and advocate for empirically based policy changes. This volume, as a compilation of the scientific progress that has been made thus far, is certainly

a step in the right direction towards better understanding the nature of mass shootings, identifying potential avenues for the prevention of future incidents, and utilizing effective postevent response. I hold great hope that, with continued empirical and theoretical work, we will continue to ask robust research questions and apply what we have learned with the aim of better understanding these incidents.

Laura C. Wilson

Part I

Background on Mass
Shootings

Challenges to the Empirical Investigation of Mass Shootings

Andrew J. Smith and Michael Hughes

The literature on the psychological consequences of mass shootings has grown rapidly in recent years. Studies have proliferated as independent researchers have addressed acute problems of trauma and recovery following mass shootings in schools, colleges, workplaces, and communities, and we have learned much about how the trauma of a mass shooting affects people (see Lowe & Galea, 2015; Shultz et al., 2014; Wilson, 2014). However, a number of issues and problems have emerged that pose challenges for researchers in this area. In this chapter we examine four core questions that reflect these challenges: What is a mass shooting? What are the outcomes in studies of the psychological effects of mass shootings, and how are they measured? What processes link mass shootings to psychological outcomes? What features of study design pose challenges for theoretical progress in understanding how exposure to mass shootings affects psychological functioning?

What Is a Mass Shooting?

The term *mass shooting* is more a term of convenience than a scientific concept. Both words that make up the term are problematic. How many victims qualify as a *mass*? The word *mass* means a large amount or number of something, but the lower bound for defining a *mass* in studies of *mass shootings* is typically no more than four (e.g., Wilson, 2014; see also Bjelopera, Bagalman, Caldwell, Finklea, & McCallion, 2013), which is not a mass in the conventional sense. The word *shooting* indicates that a firearm has been used to kill or injure victims. Common sense indicates that a *shooting* is experienced as disturbing or traumatic to victims and observers. However, this restriction is limiting if our interest is in events with fatalities and/or injuries that have serious psychological consequences. Similar acts using other means such as explosives, machete and knife attacks, and intentional vehicle homicides are also traumatic and disturbing (Fox & Levin, 2015).

Thus, a focus on shootings may in some ways be too narrow. But without further qualification, it may also be too broad. Assuming that we mean that a mass shooting involves some number of people who have been killed or injured using firearms, do we mean any such incident (Fox & Levin, 2015)? Do we include gang-related violence, robberies, and homicide-suicides that occur in private residences? An additional issue relates to whether our assessment of the magnitude of an event should be based only on the numbers of victims shot fatally. Nekvasil, Cornell, and Huang (2015) reconceptualize the phenomenon as a multiple casualty homicide, and argue that single homicides with more than one victim (i.e., wounded or injured survivors) qualify for our attention as well.

There is no straightforward solution to determining what to include under the mass shooting umbrella. The underlying issue is that the way analysts define a mass shooting largely depends on the function that the concept serves in the project to which it is applied. For example, in their Congressional Research Service Report, Bjelopera and colleagues (2013) define public mass shootings as “incidents occurring in relatively public places, involving four or more deaths – not including the shooter(s) – and gunmen who select victims somewhat indiscriminately. The violence in these cases is not a means to an end such as robbery or terrorism” (p. 4). This definition is in line with the purpose of the report to provide the U.S. Congress with a basis for discussion and debate about a form of violence that may not be adequately addressed by current legislation and policy. The number of fatalities required in this definition of public mass shootings was based on a definition of mass murder that the FBI presented in a report on serial murder (Federal Bureau of Investigation, 2008).¹ Arbitrariness in the number of fatalities in the definition of mass shootings is underscored by recent legislation passed by the U.S. Congress stating that “the term ‘mass killings’ means 3 or more killings in a single incident” (Investigative Assistance for Violent Crimes Act of 2012, 2013, p. 126 STAT. 2435).

Researchers have also been inconsistent and have used several cutoffs from two to four shooting-caused casualties to define mass shootings (Nekvasil et al., 2015). In their study of nearly 19,000 homicide incidents from 2005 to 2010, Nekvasil and colleagues (2015) compare the effectiveness of cutoffs of two, three, four, and five or more victims, concluding: “It seems likely that no specific cutoff for number of victims is sufficient to identify a meaningfully distinct form of homicidal violence” (p. 8).

We can conclude that there is no fixed or universally accepted definition of a mass shooting. Definitions of mass shootings do not vary greatly, but all contain ad hoc and arbitrary elements that may affect research outcomes and thus our understanding of mass shootings prevention, prediction, and intervention innovation. This is also true of the definition used in the present volume: a gun violence incident that results in four or more victim deaths. Is there any rationale for settling, however provisionally, on this definition? We think that there is, and that the rationale has two parts.

First, the focus on gun violence captures a large majority of multiple casualty homicides. Recent evidence demonstrates that the primary weapon used in more than four out of five such incidents is a firearm, and as the number of victims increases, the likelihood that a firearm was used increases monotonically (Nekvasil et al., 2015). A firearm was the primary weapon used in nearly 95% of multiple casualty homicides with six or more victims. Because shooting incidents are, by far, the most prevalent form of multiple homicide, they are more available for study than other incidents, and they provide evidence for understanding the vast majority of mass homicides that occur. Nonetheless, it is likely that as this tragic literature grows, studies will address an increasing diversity of research problems and theoretical issues, and researchers should be attentive to hypotheses about whether and how different forms of mass homicide may have different psychological outcomes.

Second, the likelihood that homicide is experienced as traumatic is higher in events involving higher casualty rates (e.g., four or more casualties). The dose-response model (Dohrenwend & Dohrenwend, 1974; March, 1993), to be discussed later in this chapter, predicts that the onset and severity of pathogenesis increases as the severity of the traumatic exposure increases. Accordingly, if researchers wish to study incidents that can be properly characterized as traumatic, then shooting incidents with four victim fatalities are more likely to qualify than incidents involving fewer casualties.

Notwithstanding this dose-response-based logic, it is important for researchers to remember that the cutoff of four fatalities is in common use not because of its potential to be pathogenic, but because it was the previous existing standard (Fox & Levin, 2015) endorsed by the FBI (Bjelopera et al., 2013; Federal Bureau of Investigation, 2008) for use in law enforcement and policy making. While the definition of a mass shooting offered in the present volume (i.e., four or more casualties resulting from gun violence) is useful, there are three reasons for believing that it can distort the knowledge base if applied consistently and rigidly:

- 1 The question remains open as to whether four or more fatalities is a meaningful cutoff to differentiate a traumatizing incident from one that is more benign.
- 2 There is no empirically supported or obvious reason why a fatal attack with a firearm would have more or qualitatively different psychological consequences than a life-threatening attack, fatal or not, with a knife, a machete, a blunt object, an explosive, a vehicle, an airplane, or any other weapon or object capable of inflicting serious injuries.
- 3 Unless we examine life-threatening attacks that result in zero fatalities, we cannot know whether fatal attacks are distinctly traumatogenic.

In short, there is no clear scientific justification for building a literature on traumatic homicides that is largely limited to shooting incidents with four or

more fatalities until research provides convincing evidence that psychological responsiveness is dependent on the numbers of victims, that it matters whether victims have been killed or only injured, and that at least four victims are required in order for an event to be experienced as distinctly traumatic by victims and survivors. Researchers should look beyond the standard definition of mass shootings and, where possible, should define research problems that probe the extent of its usefulness.

What Are the Outcomes in Studies of the Psychological Effects of Mass Shootings?

Most psychological research on those exposed to mass shootings focuses on predicting posttraumatic stress reactions following the events, particularly posttraumatic stress disorder (PTSD) or posttraumatic stress symptoms (PTSS).² Researchers have also examined a number of other outcomes, including psychological distress, depressive symptoms, anxiety symptoms, grief, personal efficacy, and quality of life.

Posttraumatic stress disorder (PTSD)

PTSD is a pattern of symptoms that follows exposure to a traumatic event, differentiated from other psychological disorders by the externally derived nature of its etiology. The diagnostic criteria for PTSD are described in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) published by the American Psychiatric Association. The DSM has gone through five editions and two revisions, including DSM-III (American Psychiatric Association, 1980), DSM-III-R (American Psychiatric Association, 1987), DSM-IV (American Psychiatric Association, 1994), DSM-IV-TR (American Psychiatric Association, 2000), and DSM-5 (American Psychiatric Association, 2013).

Though PTSD has been controversial (McNally, 2003), and the diagnostic criteria have been revised several times since its first inclusion in DSM-III in 1980, the core elements have been relatively consistent across DSM revisions. The original diagnosis required that a person display symptoms from three symptom clusters (i.e., re-experiencing [intrusive recollections], avoidance/numbing, hyper-arousal; McNally, 2003) following exposure to a traumatic event, and that the symptoms cause clinically significant distress or impairment.

PTSD is most reliably diagnosed through the administration of structured diagnostic interviews conducted by trained interviewers, such as the Anxiety Disorders Interview Schedule IV (Brown & Barlow, 2014) and the Clinician-Administered PTSD Scale for DSM-5 (Weathers et al., 2013). Such an approach allows the probing of answers and clinical judgment by a trained interviewer,

both of which increase the reliability of diagnoses. Self-report measures of PTSD that are administered by questionnaire have also been developed (e.g., Davidson et al., 1997; Foa, Cashman, Jaycox, & Perry, 1997; Kilpatrick, Resnick, Saunders, & Best, 1989; Norris & Hamblen, 2004; see Orsillo, 2001). These measures mimic a clinical interview in that the respondent is asked survey questions, either by a lay interviewer or in paper and pencil format, that tap the criteria that make up the PTSD diagnosis.

Posttraumatic stress symptoms (PTSS)

Diagnosing respondents by clinical interview in large studies is time-consuming and costly. In order to mitigate these problems, researchers have developed PTSS indices consisting of items that tap symptoms in some or all PTSD symptom clusters (e.g., Brewin et al., 2002; Foa, Riggs, Dancu, & Rothbaum, 1993; Kubany, Leisen, Kaplan, & Kelly, 2000; see also Norris & Hamblen, 2004; Orsillo, 2001). Most studies of the psychological consequences of mass shootings have used PTSS as the primary outcome. Data using these indices can be analyzed as dimensional measures (i.e., continuous variables) or, with the addition of a cutoff point defining a high level of posttraumatic stress (e.g., Hughes et al., 2011), as a dichotomy. However they are administered and operationalized, PTSS indices measure severity of symptoms on a continuum. They are not indicators of PTSD. Making a PTSD diagnosis requires not a particular number of symptoms, but a particular combination of symptoms from each symptom cluster, along with clinical significance.

PTSD diagnostic measures and PTSS continuous measures differ in several important ways. First, PTSS indices measure self-reported symptoms of post-traumatic stress, rather than whether a respondent meets the clinical criteria for PTSD. Second, dimensional indicators typically tap symptoms whether or not they are clinically significant (i.e., cause distress or impairment). Third, diagnostic interviews administered by trained mental health professionals in standardized format allow for clinical judgment that includes probes to clarify the meaning of answers, whereas dimensional assessments, which are typically administered in self-report questionnaire format, do not. Fourth, establishing a cutoff point on a continuous indicator of PTSS to define PTSD cases is not equivalent to a diagnosis of PTSD by a trained clinician. When research subjects evaluated for PTSD using cutoff points on a dimensional indicator are also separately diagnosed by clinical interviewers, there are often respondents with PTSD in clinical interviews who score below the cutoff point on the dimensional measure (false-negative), and there are respondents without PTSD in the clinical interview who score above the cutoff on the dimensional measure (false-positive). Those who have developed these dimensional assessments have worked to keep these errors in an acceptable range (e.g., Brewin et al., 2002; Foa et al., 1997), but they have

not eliminated them, and the results of studies using PTSS measures should always be interpreted with these limitations in mind.

Psychological distress, depression, and anxiety

Less commonly, mass shootings researchers have examined outcomes other than PTSD and PTSS that can occur in the wake of traumatic events, including distress (e.g., Smith, Donlon, Anderson, Hughes, & Jones, 2015), depression (e.g., Vicary & Fraley, 2010), anxiety (e.g., Grills-Taquechel, Littleton, & Axsom, 2011), and grief (e.g., Smith, Abeyta, Hughes, & Jones, 2015). As is the case with measures of PTSS discussed above, distress, depression, and anxiety indices provide measures of symptom severity rather than clinical diagnoses. Whereas clinical cut-offs/norms for determining levels of severity for depression (Beck, Steer, & Brown, 1996) and distress (Kessler et al., 2002) are available, as measures of psychopathology, these measures share the same strengths and limitations as reviewed above for PTSS compared to PTSD.

Grief reactions

Grief is a normal psychological outcome that is likely to occur among people who were involved in social relationships with those killed in mass shootings. Feelings of loss, yearning, heartache, anger, and depression, along with disruptions in self-concept and confusion about one's place in the world are typical grief reactions. Normal grief subsides within a few weeks or months, but sometimes grief is persistent, causes significant distress, and is disabling. Complicated grief (Prigerson et al., 1995) and prolonged grief (Prigerson et al., 2009) are two similar ways this has been conceptualized. Using dimensional indices of grief symptoms, researchers have found prolonged grief among children (Nader, Pynoos, Fairbanks, & Frederick, 1990) and college students (Smith, Abeyta, et al., 2015) in the aftermath of mass shootings. Pathological grief has never been defined as a mental disorder in the DSM, but the recent DSM-5 (American Psychiatric Association, 2013) includes proposed criteria for persistent complex bereavement disorder, a prolonged and debilitating pattern of grief, in an appendix as a condition for further study.

Recent innovations in grief theory beyond the uni-dimensional and pathology-based complicated grief literature should be considered in future mass shootings studies and interventions. Specifically, multidimensional grief theory proposes that adaptive and maladaptive grief reactions may occur along three underlying, interrelated dimensions, including separation distress, existential/identity distress, and circumstance-related distress (Kaplow, Layne, Saltzman, Cozza, & Pynoos, 2013). The first two dimensions (i.e., separation-related distress, existential/identity-related distress) share some similarities with prior conceptualizations of grief.

Circumstance-related distress, on the other hand, is a reaction to traumatogenic elements embedded within the circumstances of a death, which are often violent and gruesome, involve human agency (e.g., malicious intent or negligence) or may involve intense pain, suffering, or progressive physical deterioration (Kaplow et al., 2013). Because of their very nature, mass shootings are theorized to contain causal risk factors (Layne, Steinberg, & Steinberg, 2014) for circumstance-related distress, particularly among people who were emotionally close to those who were killed (Pynoos, 1992). Under these conditions, circumstance-related distress may center on such aspects as the potential preventability of the event, malicious intent of the shooter(s), last moments (e.g., terror and suffering among victims; being unable to care for the victims in their last moments), gruesome injuries, and/or desires for revenge (Kaplow et al., 2013). Given that many of the reactions extend beyond the formal DSM-5 PTSD criteria, future research on mass shootings may consider multidimensional grief as a useful framework for understanding the broad spectrum of personal reactions to losses often consequent to mass shootings, including dual sets of reactions (e.g., traumatic stress and grief) arising from the interplay of traumatic stress exposure and bereavement (Pynoos, 1992).

What Processes Link Mass Shootings to Outcomes?

Most perspectives on how mass shootings affect psychological functioning are grounded in the dose-response model (Dohrenwend & Dohrenwend, 1974; McNally, 2003; Wilson, 2014). According to the model, the greater the exposure to traumatic conditions, the worse the psychological impact will be. The dose-response model provides the basis for the diagnosis of PTSD through the assumption that exposure to a traumatic event produces the symptom patterns characteristic of the disorder. The dose-response model adds the simple notion that as exposure increases, so too does the negative response.

Exposure

The literature on mass shootings generally assumes that greater direct or indirect exposure to a mass shooting influences the onset and severity of psychopathology (Norris, 2007; Wilson, 2014). Less clear are the kinds of exposures that lead to negative outcomes. Exposure characteristics that define the initial requirements for a PTSD diagnosis (i.e., Criterion A) have been altered in each edition of the DSM, an evolution that demonstrates how the field of traumatic stress has wrestled with the question: “What qualifies as traumatic exposure?” DSM-III considered traumatic exposure as “a recognizable stressor that would evoke significant symptoms of distress in almost anyone” (American Psychiatric Association, 1980, p. 238). DSM-III-R indicated that a traumatic event is

“outside the range of usual human experience” and “markedly distressing to everyone” (American Psychiatric Association, 1987, p. 250). DSM-IV required that the “person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury or a threat to the physical integrity of self or others” and that the reaction “involved intense fear, helplessness, or horror” (American Psychiatric Association, 1994, 427–428³).

The definition of a traumatic event in the DSM-5 is considerably more restrictive, defining a traumatic event as “exposure to actual or threatened death, serious injury, or sexual violence in one (or more) of the following ways: (1) Directly experiencing the traumatic event(s), (2) witnessing in-person the event(s) as it occurred to others, (3) learning that the traumatic event(s) occurred to a close family member or close friend (in cases of actual or threatened death of a family member or friend, event(s) must have been violent or accidental), or (4) experiencing repeated or extreme exposure to aversive details of the traumatic event(s)” (American Psychiatric Association, 2013, p. 271). The DSM-5 specifically excludes previously considered forms of exposure through media (e.g., TV, radio, movies, pictures) unless such exposure is work related.

Direct and indirect exposure

The majority of the research on mass shootings has been done using the more expansive trauma definitions in the DSM-III, DSM-III-R, and DSM-IV, allowing investigators to look across a range of exposures in testing the dose-response model and to examine both direct and indirect exposure (e.g., DSM-5 excluded media exposure; Fallahi & Lesik, 2009; Haravuori, Suomalainen, Berg, Kiviruusu, & Marttunen, 2011). Direct exposure is experiencing an event first-hand by being a victim or by observing the event in person (e.g., being wounded, seeing others being killed or wounded, or observing the physical consequences and human suffering of others in the event aftermath; for a more in-depth understanding of direct exposure see Chapter 11 in this volume). Indirect exposure is experiencing consequences, depictions, and other elements of the event without being physically present at the site of the traumatic event (e.g., knowing someone who was killed or injured in a shooting, observing activities that unfold during or after a shooting [SWAT team response], or experiencing the event through media).

Research has sought to examine the impacts of both kinds of exposure on outcomes. For example, early research conducted following sniper attacks at an elementary school in 1984 examined associations between two exposure parameters – physical proximity to the shooting epicenter (i.e., direct exposure) and social proximity (e.g., closeness) to the deceased (i.e., indirect exposure) – and

outcomes. This research revealed a dose-response relationship between physical proximity to the shooting epicenter (interpreted as increasing direct life threat) and PTSS symptoms both cross-sectionally (Pynoos, Frederick, et al., 1987) and longitudinally (Nader et al., 1990), as well as a dose-response relation between social proximity to the deceased child and longitudinal grief reactions (Nader et al., 1990; Pynoos, Nader, Frederick, Gonda, & Stuber, 1987). Subsequent mass shootings research has also made distinctions between direct and indirect exposure (e.g., Littleton, Axsom, & Grills-Taquechel, 2009). Review of the broad mass-disaster literature suggests that both direct and indirect forms of exposure are relevant to the study of mental health outcomes (see Neria, Nandi, & Galea, 2008).

Mediators and moderators

While influential early studies of traumatic stress straightforwardly applied the dose-response model (Nader et al., 1990; Pynoos, Frederick, et al., 1987; Pynoos, Nader, et al., 1987), more recent research emphasizes pre- and posttraumatic factors that may moderate or mediate the dose-response relationship (see Brewin, Andrews, & Valentine, 2000; Layne, Warren, Watson, & Shalev, 2007; Ozer, Best, Lipsey, & Weiss, 2003; Silverman & La Greca, 2002). If an association between two variables depends on the level of a third variable, that third variable is a moderator. If the effect of one variable on another is due to a third variable that intervenes between them, then that third variable is a mediator (Baron & Kenny, 1986; see also Wheaton, 1985).

Studies of mass shootings do not usually examine moderation and/or mediation of events themselves, as suggested by Baron and Kenny (1986), because most studies of mass shootings collect data only from those who were exposed to the shooting, and thus exposure to the event is a constant. Studies limited to those exposed to traumatic conditions can provide suggestive evidence that can be interpreted by the logic of mediation or moderation (e.g., Bomyea, Risbrough, & Lang, 2012; Littleton, Grills-Taquechel, & Axsom, 2009; Schwarz & Kowalski, 1992). In addition, studies of those exposed to shootings can examine whether event characteristics (e.g., event type, exposure severity) are mediated or moderated by other factors (Brewin et al., 2000; Ozer et al., 2003). However, it is important to understand that in order to establish whether the effect of exposure itself is mediated or moderated by other factors, one must first estimate the effect of exposure, and that requires a sample of people who have not been exposed. Because most studies of mass shootings include data only from exposed respondents, and not from a comparison group, control group, or group of otherwise unexposed respondents, the ability of researchers to examine mediation and moderation of exposure is often seriously limited.

Challenges in Research Design and Theoretical Development

A number of theoretical frameworks have been applied to explain the effects of mass shootings, but little progress has been made in developing an integrative theory for how mass shootings cause psychological outcomes in survivors. Recent meta-analytic findings highlight the problem of lack of replication and the difficulty estimating aggregate effect-sizes in the current mass shootings literature (see Wilson, 2014). Most researchers studying mass shootings have focused on specific theoretical or applied questions, but they have not typically investigated alternate hypotheses in ways that could lead to a more comprehensive understanding of how traumatic experiences lead to pathogenic outcomes. The result is a collection of well-executed but theoretically disconnected studies that emphasize, for example, (1) peritraumatic processes (Kumpula, Orcutt, Bardeen, & Varkovitzky, 2011); (2) conservation of resources (Littleton, Axsom, et al., 2009); (3) social network interactions and coping appraisals (Smith, Donlon, et al., 2015); (4) emotion regulation (Bardeen, Kumpula, & Orcutt, 2013); (5) core belief alterations (Grills-Taquechel et al., 2011; Smith, Abeyta, et al., 2015); (6) gene-environment interaction influence on postshootings PTSS (Mercer et al., 2012).

Five other factors limit theoretical innovation and development in the mass shootings literature. First, sampling problems limit the generalizability of the findings in mass shooting studies. Specifically, mass shootings survivor samples are typically composed of respondents within a limited age range (e.g., children, adolescents, or emerging adults in the wake of shootings in schools or colleges). There have been some studies of shootings in places other than schools (e.g., Cafeteria shootings in Kileen, TX; North, Smith, & Spitznagel, 1994, 1997), allowing for examination of the effects of shootings on people at different points in the life course. However, because studies are not typically based on systematically collected and theoretically relevant data from adequate numbers of people of different ages, researchers who would like to consider developmental differences must make interpretations based on studies of different events, in different contexts, with different variables, and demographically different respondents.

Second is the related problem of there being few longitudinal studies of the psychological consequences of mass shootings. Without long-term follow-up research, and without consideration of developmental timing of events on long-term functioning, the effects of mass shootings cannot be fully known. For example, without following up with respondents who experience shootings during their college years, it is unclear whether such traumatic experiences impair the development of intimate relationships across the lifespan as argued on the basis of cross-sectional studies (e.g., Layne, Pynoos, & Cardenas, 2001). One notable strength in the mass shootings literature is the prospective studies

made possible by ongoing research studies started prior to shooting events that have allowed researchers to add a focus on pre- to postshooting functioning changes (e.g., Bardeen et al., 2013; Littleton, Axsom, et al., 2009).

Third, although some early psychological research on the effects of shootings employed clinical interviews (Pynoos, Nader, et al., 1987), the majority of studies in this literature rely solely on the use of self-reports of symptom inventories that provide continuous measures of PTSS, distress, depression, anxiety, and/or grief reactions. As a result, our knowledge of how trauma affects psychological outcomes is shaped to an unknown degree by problems of response bias and other measurement errors known to affect self-report measures (e.g., Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Reasons for this measurement strategy are based largely on challenges that are involved in conducting postshooting research: clinical interviews are expensive, time-consuming, and intrusive during a sensitive posttraumatic time in communities affected by mass shootings, compared to cheaper, less intrusive, easier-to-administer self-report surveys. Nonetheless, without more studies that employ clinical interviews, and more studies that include explicit validation of self-report measures, our knowledge of how traumatic events affect psychological functioning is and will remain limited.

Fourth, due to the dominance of the dose-response model, studies in the mass shootings literature typically include some form of exposure (e.g., physical proximity to shootings, social proximity to shootings, direct vs. indirect exposure, perceived peritraumatic threat) as part of model testing. However, many different operational definitions of exposure have been used in studies of mass shootings. In addition, it is not always clear why certain exposure features have been selected by researchers and others ignored. Research is needed to develop an empirically supported typology of exposure to guide researchers to design studies with comparable measures. Shootings and exposure contexts vary across a number of dimensions, as do the characteristics, backgrounds, social networks, and life circumstances of survivors and bystanders. It is unlikely that exposure has the same effects in every case, and thus, as noted above, it is important to investigate how shooting characteristics and victim characteristics moderate and/or mediate various kinds of exposure. We will be unable to understand these processes in a theoretically coherent way unless there is some consistency in the operational definitions of exposure.

Fifth, publication of null findings are nonexistent in the mass shootings literature, and thus, there is little systematic knowledge about variables and interventions that *do not* work (see Hopewell, Loudon, Clarke, Oxman, & Dickersin, 2009). This problem is linked to the issue of consistent operational definitions. Unless researchers can be fairly certain that they are investigating the same kinds of exposure as others have, then the meaning of a null result is ambiguous. A null finding could be theoretically significant and mean that some form of exposure has no impact in certain situations or among certain

kinds of victims, but it could just as well have little or no theoretical significance and simply mean that different operational definitions of exposure lead to different findings in different studies.

Conclusions

Our review of challenges in the study of mass shootings leads to three broad conclusions. First, previously applied definitions and frameworks may be too limiting and may stunt progress in understanding how shootings affect outcomes. Defining a mass shooting as a gun violence incident with four or more fatalities is clearly useful, but until we know that the restrictions built into the definition are meaningful in defining an incident that is distinctively traumatogenic, researchers should be wary of applying it in a rigid way. Similarly, defining psychopathological outcomes in terms of the DSM-5 definition of PTSD severely limits researchers to a narrow range of exposure, and in addition, restricts the definition of psychopathology to a single monotonic response. As an outcome, it is important that PTSD is understood for epidemiological, clinical policy and planning, and legal purposes. But unless it can be shown that exposures that violate PTSD Criterion A are truly not associated with negative psychological outcomes, and that subclinical symptomatology has little or no impact on psychological adjustment following a trauma, researchers interested in developing a full understanding of the impact of mass shootings should avoid the strict application of the PTSD diagnosis in their research designs.

Second, unless there is some consistency in the theoretical and operational definitions of key concepts, it will be difficult to make any theoretical progress. Although there seems to be some consensus on the meaning and operational definitions of the key outcomes in mass shootings research, the same cannot be said for exposure. Without an empirically grounded consensus on how to conceptualize and measure exposure, it will be difficult to build a body of findings that promotes the development and testing of theoretically productive hypotheses. This is also true of key factors hypothesized to mediate and moderate the effects of exposure. If each researcher conceptualizes and measures these factors differently, the results may be interesting and provocative without being theoretically informative.

Third, most studies of mass shootings have been designed quickly in the aftermath of events that no one could have predicted. With little time to plan, researchers have used procedures that could be implemented in a short period of time, have relied on samples that were relatively easy to collect in schools and colleges, and have employed data collection instruments with measures that were close at hand. In addition, while there have been prospective studies done with respondents already recruited for studies with another purpose,

there have been few longitudinal studies that could investigate issues of how traumatic events affect people going through different developmental stages in the life course. Researchers need to broaden the scope of their studies to examine more kinds of victims over longer periods of time. In addition, in view of the likelihood of future traumatic shooting incidents, some researchers should do prospective planning so that they are ready and able to do theoretically productive study when the opportunity arises.

Considering the frequency of mass shootings over the past three decades (Bjelopera et al., 2013), it is an unfortunate reality that the incidence of mass shootings is unlikely to significantly decline. Thus, social scientists will have opportunities to investigate these future traumatic shooting incidents and to add to a growing body of empirical evidence on how they affect the psychological adjustment among victims, bystanders, and those in their social networks. Although replication is important, it is also critical to generate knowledge that takes us beyond what we already know, and to do so in ways that facilitate the development of theoretical approaches that can complement and build upon one another in the service of promoting individual and community recovery.

Notes

- 1 The FBI (Federal Bureau of Investigation, 2008) defined mass murder as “(a) number of murders (four or more) occurring during the same incident, with no distinctive time period between the murders. These events typically involved a single location, where the killer murdered a number of victims in an ongoing incident” (p. 8).
- 2 For an overview of measures and issues in the assessment of PTSD and PTSS see <http://www.ptsd.va.gov/professional/assessment/overview/index.asp>
- 3 Criterion A is the same in the two versions of the DSM-IV.

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The Patterns and Prevalence of Mass Public Shootings in the United States, 1915–2013

Grant Duwe

The 1960s marked the onset of a crime wave in the United States that did not begin to subside until the 1990s. The property crime rate nearly tripled in size from 1960 to 1990, while the violent crime rate in 1990 was roughly five times higher than it was 30 years earlier (Federal Bureau of Investigation, 1960, 1990). Over the past 20 years, however, crime has been on the decline. Perhaps most notably, the homicide rate in 2011 was about half of what it was in 1991 (Federal Bureau of Investigation, 1991, 2011).

Mass murder is an extreme form of violence that is, in some ways, an outlier within the broader context of crime. It may be tempting, therefore, to assume that mass killings not only defy explanation, especially from mainstream criminological theories, but also bear few similarities with crime in general. But the evidence shows that, similar to homicide and crime in general, the 1960s also marked the onset of a mass murder wave in the United States (Duwe, 2004, 2007). This wave was not unprecedented, however, as mass murder rates were just as high during the 1920s and 1930s (Duwe, 2004, 2007). And, once again, consistent with trends in homicide and crime in general, mass murder rates have generally been on the decline since the 1990s (Duwe, 2012).

Existing research on mass murder suggests the two waves during the twentieth century were qualitatively different (Duwe, 2004, 2007). The first one during the 1920s and 1930s was comprised mainly of familicides and felony-related massacres, which, then as now, are less likely to receive widespread news coverage. In contrast, the second mass murder wave contained a greater number of mass public shootings, which have long attracted intense interest and concern (Duwe, 2000, 2004).

There has been substantial debate about how to define mass public shootings, including factors such as the motivation behind the event and the number of casualties. In this chapter, I define mass public shootings as incidents that

occur in the absence of other criminal activity (e.g., robberies, drug deals, gang “turf wars”) in which a gun was used to kill four or more victims at a public location (Duwe, Kovandzic, & Moody, 2002). Prior to 1965, there had been relatively few mass public shootings in the United States. The frequency with which these incidents occurred, however, accelerated rapidly during the last third of the twentieth century (Duwe, 2007). The number of mass public shootings per decade grew from 13 during the 1970s to 30 in the 1980s, peaking with 37 in the 1990s. From 2000 to 2013, there were 53 mass public shootings in the United States.

In this chapter, I trace the history of mass public shootings in the United States by examining 160 cases that occurred between 1915 and 2013. Given that there has been increasing discussion of whether mass public shootings have recently been on the rise, I begin by delineating trends in their prevalence. Next, I focus on the patterns of mass public shootings by reporting incident, victim, and offender characteristics. But before describing the prevalence and patterns of mass public shootings in the United States, I provide a brief description of the dataset I used for this chapter.

Mass Public Shooting Dataset

Much of the data on the 160 cases are drawn from my previous research on mass killings that occurred in the United States between 1900 and 1999 (Duwe, 2004, 2007). In this research, I used the FBI’s Supplementary Homicide Reports (SHR) to anchor my search for data on mass murders. It is important to acknowledge that the SHR data have flaws. As I have noted previously (e.g., Duwe, 2000, 2004), there is an underreporting problem with the SHR since it is a voluntary program involving law enforcement agencies across the country. Moreover, the SHR data contain a number of coding errors. Nevertheless, because the SHR contains incident, victim, and offender information on most murders committed in the United States since 1976, it is an invaluable source of data on homicides, mass murders, and, more narrowly, mass public shootings.

Still, the information provided by the SHR is limited. For example, the SHR does not record whether the homicide occurred in a public location or the number of wounded victims. Therefore, I have also relied on news accounts as a source of data on mass killings. More specifically, after using the SHR to identify when and where mass murders have occurred, I have searched online newspaper databases to collect additional information not included within the SHR. In using this triangulated data collection approach, I have been able to not only identify cases not reported to the SHR but also to correct errors in the SHR data.

After pioneering this methodology in my prior research on mass killings (Duwe, 2000, 2004, 2007; Duwe et al., 2002), others have since adopted the

same approach in their own data collection efforts. For example, reporters from *USA Today* relied on the SHR and news reports as sources of data in the series of articles they published on mass killings (Overberg, Upton, & Hoyer, 2013). More recently, the Congressional Research Service (CRS; 2014) used the same process to collect data on mass shootings.¹

For the cases that occurred between 1976 and 2013, I used the triangulated SHR-news report data collection strategy. Further, for cases occurring within this timeframe, but especially those that have taken place since 2000, I also relied on data collected by the CRS (2014). As a result, the dataset I used for this chapter is more accurate and complete than the datasets I have used in prior publications on mass public shootings (Duwe, 2012, 2013, 2014). Overall, during the 1976–2013 period, a little more than 1,000 mass murders occurred in the United States. Of these, 125 were mass public shootings.

Because the SHR did not become a valuable source of data until it underwent a major revision in 1976 (Riedel, 1999), I relied on the *New York Times* index to locate news accounts on mass murders that occurred between 1900 and 1975 (Duwe, 2000, 2004). During this 76-year period, I found news reports on 260 mass killings (Duwe, 2004). Of these incidents, 35 were mass public shootings, which brings the total to 160 for the 1900–2013 period.

Mass Public Shootings in Context

It is worth emphasizing that mass public shootings are a rare type of mass murder, which is itself a rare form of violence. In my previous work, I have defined mass killings as incidents in which four or more victims are murdered within a 24-hour period (Duwe, 2000, 2004, 2007). Since 1900, there have been more than 1,300 mass murders in the United States. But since 1976, when more complete data have been available, there have been a little more than 1,000, which amounts to an average of 28 mass murders each year. During the same period of time in the United States, there have been, on average, approximately 14,200 homicides per year. As a result, mass murders make up a mere 0.2% of all homicide incidents. But due to the greater number of victims per incident, mass killings account for roughly 1% of all homicide victims each year (Duwe, 2007).

As noted above, there were 125 mass public shootings in the United States from 1976 to 2013. Given that there were more than 1,000 mass murders during this same 34-year period, mass public shootings account for a little more than 12% of all mass killings. Familicides are by far the most common form of mass murder, making up nearly 45% of all mass killings since 1976. Familicides most often involve a male head of the household killing his partner (i.e., spouse, ex-spouse, fiancée), their children, relatives, or some combination of these. Felony-related massacres are the second most common type of mass murder,

comprising roughly one quarter of all mass killings since 1976. These incidents typically involve a small group of young men who commit mass murder during a robbery.

The Prominence of Mass Public Shootings in the Social Construction of Mass Murder

Although rare, even within the context of mass killings, mass public shootings are often thought to define the essence of mass murder. As I noted above, mass public shootings generally capture extensive attention from the news media, and this has been true since the beginning of the twentieth century (see Chapters 7–10 for more on the role of the media following mass shootings). In a previous study, I examined the factors that predicted greater news coverage for 495 mass murders that took place in the United States between 1976 and 1996 (Duwe, 2000). The “body count,” both in terms of wounded and killed victims, had the greatest impact on the extent to which the news media reported a mass murder. As shown later, the 160 mass public shootings had, on average, more than six fatal victims and nearly five wounded victims per incident, which are both greater in comparison to mass murders in general.

But the larger number of victims killed and wounded is not the only reason mass public shootings are the most newsworthy mass killings. Mass public shootings are also more likely to involve stranger victims than other mass murders. As I indicated in the 2000 study:

massacres were even more tragic when strangers were killed. These incidents conjure up images of random violence because the slaughter of strangers connotes an indiscriminate selection of victims. As a result, a sharp distinction is drawn between victims and offenders: Victims are depicted as blameless or virtuous, whereas offenders are characterized as evil, crazy, and less than human. Moreover, the seemingly random selection of victims broadens the news interest by conveying the impression that anyone could be a victim of a mass killing. (Duwe, 2000, p. 391)

Mass public shootings are also, by their very definition, highly visible acts of violence. The results from my 2000 study showed, for example, that publicly occurring mass killings were significantly more newsworthy than those which took place in a residential setting. Again, I note that publicly occurring mass murders

usually involved a number of people who witnessed and survived the attack, which gave the news media the means to deliver a fascinating firsthand account to the audience, allowing them to vicariously experience the horror of the event.

In addition, the audience is generally more apt to identify with the victims of these incidents, for they were killed simply because they were in the wrong place at the wrong time. (Duwe, 2000, p. 391)

More so than other mass murders, mass public shootings tend to be exceptionally newsworthy because they are “riveting, emotionally evocative incidents” that epitomize “news as theater – a morality play involving pure, innocent victims and offenders who seemingly went ‘berserk’ in a public setting” (Duwe, 2000, p. 391).

The extensive news coverage given to mass public shootings, especially in relation to other mass killings, has helped influence perceptions about the typical mass murder (Duwe, 2005). Because mass public shootings may involve, as we shall see later, individuals with mental health difficulties who use guns to carry out an attack at a public location, such as a school or the workplace, mass murder has been constructed as a problem involving gun control, workplace violence, school shooting, and, most recently, mental health. Given that perceptions help shape policy recommendations in the aftermath of such events, proposals to reduce mass killings have often focused on gun laws, school and workplace policies, and mental health reform.

Trends in the Prevalence of Mass Public Shootings

Amid the wave of publicity, interest, and concern following a mass public shooting, there are often attempts to promote better understanding by explaining and interpreting the incident within a broader context. To that end, the news media frequently interview “experts,” who offer their views about the type of individual who commits this type of violence (i.e., a “profile” of a mass murderer), whether mass murders or, more narrowly, mass public shootings are on the rise, and what can be done in the future to prevent their occurrence. In a later section, I will describe the incident, victims, and offender characteristics of the 160 mass public shootings examined in this chapter. In the present section, however, I will present data on trends in the prevalence of mass public shootings.

Whether mass public shootings have recently been on the rise has been a matter of some debate. Often relying on the list of cases compiled by Mother Jones, some have argued that mass public shootings have become more frequent in the past 5–10 years (Follman, 2013). Others, including myself, have claimed that mass public shootings have not been on the rise. As I recently wrote, however, the truth is a little more complicated (Duwe, 2014).

But before delving more fully into this debate, it is worth first taking a look at long-term trends in the prevalence of mass public shootings. In my research on mass murder, which examines cases from 1900 to the present, the first mass

public shooting in the twentieth century likely occurred in 1915 in Brunswick, Georgia in which a real estate dealer and prominent businessman used a shotgun to kill 6 and wound 32 more.² The offender had recently become involved in litigation in the local courts after losing a considerable amount of money in real estate transactions. He had had a number of dealings with Harry Dunwoody, a prominent attorney and local politician, who had been mayor of Brunswick at one time and had served in the Georgia legislature as a representative and as a senator.

Blaming Dunwoody for his financial losses, the offender began his attack at noon by killing Dunwoody in his office. He then went into the street and began to shoot at the crowd that gathered in response to the initial shotgun blasts. A few people were hit with stray bullets a couple of blocks away. After getting shot once, E. C. Butts, an attorney, went to a hardware store, grabbed a pistol, and started firing at the offender. Nearly 30 minutes after the offender had started his rampage, Butts hit him with a lethal shot ("Kills five," 1915).

Following this case, there was an additional mass public shooting in 1918 and two more in the late 1920s. During the 1930s, there were at least nine mass public shootings in the United States. One of these occurred on December 16, 1935, in Los Angeles, California when a 44-year-old male killed six coworkers and wounded one more. The offender had been employed by the Works Progress Administration (WPA), a New Deal initiative launched by Franklin Delano Roosevelt to help provide work for the unemployed during the Great Depression. He had been employed by the WPA for about a year to work on a project aimed at constructing a large sewer. Fired several days before the attack due to his inability to handle the water buckets, the offender returned to exact revenge on those he held responsible.

Workplace mass murderers are often paranoid and blame others for their employment problems. Indeed, when he was apprehended by the police after the shootings, the offender said, "I told those fellows last Friday I was coming to get them, and I did. They have been persecuting me for a year and that foreman wouldn't let me work on that job. But I fixed them up all right. If you only understood the whole thing, you wouldn't blame me for what I did. I know them all and I was going to clean them out" ("Slays 4 WPA men," 1935).

Following eight mass public shootings during the 1940s, there were only three cases that occurred in the United States between 1950 and 1965. As Fox and Levin (2011) have observed, 1966 marked the beginning of a mass murder wave, for that was the year in which massacres were committed weeks apart from each other in Chicago and Austin, and each was dubbed the "Crime of the Century" (Duwe, 2007). Killing 16 and wounding 30 more at the University of Texas, the attack in Austin was, at that time, the worst mass public shooting in American history. The Austin case proved to be a bellwether for the overall increase in mass public shootings over the past 50 years. In the

50 years prior to the Austin mass murder, there had been 24 mass public shootings. In the 50 years since that time, there have been 135.

When we look at trends in the prevalence of mass public shootings, particularly since the 1960s, a few points are worth making. First, although catastrophic, mass public shootings are, fortunately, very rare. Even when we focus on the past 50 years, wherein mass public shootings have been more common, we see an average of fewer than three cases per year. The average increases to four per year when we focus on the past 25 years, but the point remains that mass public shootings occur infrequently.

Second, when we assess prevalence trends over time, it is necessary to account for changes in the size of the population. When we try to determine whether crime (or certain types of crime such as murder) is up or down, we generally rely on a per capita measure (e.g., rate per 100,000 residents) that adjusts for population growth. In 2011, the number of murders in the United States (14,612 murders) was roughly the same as it was in 1969 (14,760 murders). Yet, given there were about 110 million more people living in the United States in 2011 (approximately 311 million) than in 1969 (approximately 201 million), the 2011 murder rate (4.7 per 100,000) is more than 35% lower than the 1969 rate (7.3 per 100,000).

Perhaps because mass public shootings are such a rare phenomenon, public debate over whether they have increased has seldom taken population growth into account. But in addition to looking at the total number of cases each year (or each month, decade, etc.), it is critical that we adjust for changes in the size of the U.S. population when assessing trends in the prevalence of mass public shootings. Due to the infrequency with which mass public shootings occur, I calculated the annual rate per 100 million of the U.S. population, as opposed to the rate per 100,000 commonly used to measure crime trends, for the 1960–2013 period (see Figure 2.1).

In addition to the annual rates per 100 million depicted in Figure 2.1, I present data on the total number of cases and the average rate per decade. As I indicated earlier in this chapter, the number of cases per decade steadily increased over the last four decades of the twentieth century, peaking at 37 during the 1990s. While the number of cases dropped slightly to 35 during the 2000s, 18 mass public shootings have already occurred during the first 4 years of the 2010s.

When we look at the rate data, we also see that rates climbed consistently from the 1960s through the 1990s. Even though more cases occurred during the 2000s than during the 1980s, the latter has a higher rate (1.27 vs. 1.18) due to a smaller U.S. population. The average annual rate for the first 4 years of the 2010s (1.44), is similar in size to, albeit a little higher than, the rate for the 1990s (1.41).

So, have mass public shootings recently been on the rise? The claims about a recent increase are valid, but only if we restrict our focus to the period of time

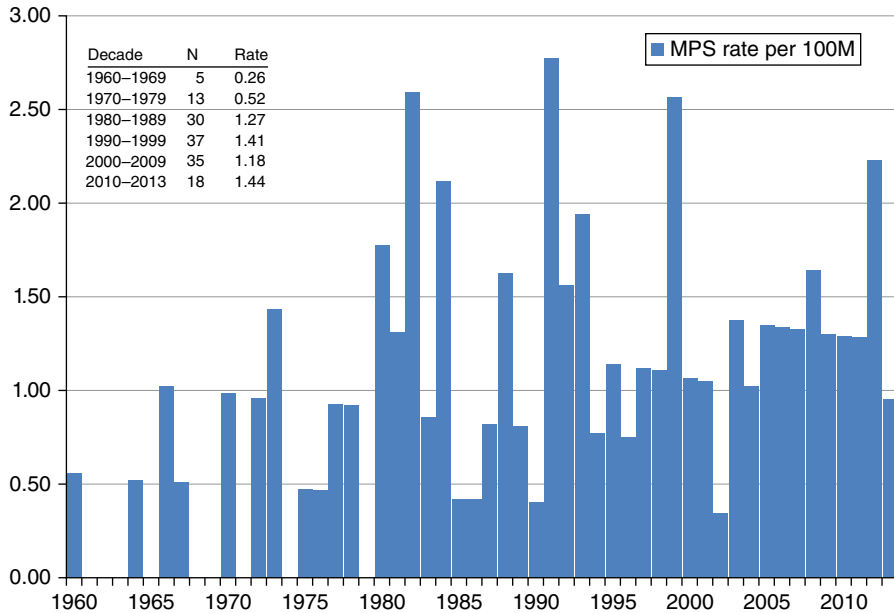


Figure 2.1 Mass public shooting rate per 100 million, 1960–2013.

since the mid-1990s. As rates of crime and violence began to fall in the latter half of the 1990s, mass public shootings rates also decreased. From 1994 to 2004, the average annual rate was 1.12. For the 2005–2013 period, however, the rate was 1.41, which represents a 26% increase.

But when we go farther back in time, rates for either the 2010–2013 or 2005–2013 periods look less remarkable. For example, the average annual rate for the 1988–1993 period was 1.52, which is similar to the rate observed for the 2007–2012 period (1.51). If we look at the 9-year time period from 1985 to 1993, we see an average rate of 1.20, which is less than the 1.41 rate for the 2005–2013 period. Yet, if we examine rates from 1980 to 1993, the annual average was 1.39, which is greater than the 1.26 average for the 2000–2013 period.

Compared to the dip in the mass public shooting rate from 1994 to 2004, there has been an uptick since 2005. But within the broader context, rates since 2005 have been similar to what we observed during the 1980s and early 1990s. It is worth remembering, however, that the increased frequency of mass public shootings during the late 1980s and early 1990s was a major catalyst in securing passage of the 1994 Federal Assault Weapons Ban (Duwe, 2005), which ultimately expired in 2004.

Although overall rates for the two periods are similar, there is at least one notable difference. Aside from 2012, annual rates for the 2005–2013 period were relatively consistent. For example, with the exception of the 2.23 rate in

2012, annual rates hovered between 0.95 and 1.64 during this period. In contrast, the yearly peaks and valleys were much more pronounced during the 1980s and early 1990s. In fact, of the 5 years that had a rate higher than 2.00, 3 (1982, 1984, 1991) were in the 1980s and early 1990s. Moreover, of the 10 years with rates higher than 1.50, 7 were between 1980 and 1993. Conversely, while the rate was below 1.00 only once (2013) between 2005 and 2013, there were 6 years that had a sub-1.00 rate during the 1980–1993 period.

The spate of mass public shootings during 2012 galvanized much of the recent interest and concern. The year 2012 was notable for mass public shootings, but not necessarily for the rate. To be sure, the 2012 rate was relatively high, but there were other years (1982, 1991, and 1999) that had higher rates. Rather, due largely to the Aurora and Newtown tragedies, the number of victims killed and wounded in mass public shootings was greater in 2012 than in any previous year.

The Patterns of Mass Public Shootings

In prior research, I reported that the average number of victims killed and wounded in 909 mass murders from 1900 to 1999 was 5.4 and 4.0, respectively (Duwe, 2007). As noted earlier, the carnage is, on average, greater for mass public shootings. In Table 2.1, which presents descriptive statistics on the 160 mass public shootings, the average number of victims killed was 6.5 and the average number wounded was 4.9.

The vast majority of mass public shooters act alone. Mass public shootings, like the one committed at Columbine, are relatively rare. Of the 160 cases, 153 (96%) were carried out by a lone offender.

School shootings have captured much of the recent attention focused on mass killings. As shown in Table 2.1, 14 of the cases (9%) could be classified as school shootings. Part of the reason for the relatively low percentage of school shootings among mass public shootings in general is due to the fact that very few occurred prior to the late 1990s. Historically, workplace shootings have been more prevalent, accounting for 31% of the cases. The remaining 60% fall into the “other” category, which includes cases such as the 2012 Aurora shooting or the 2011 attack carried out in Tucson, Arizona.

With the exception of one female offender, who committed a workplace shooting in California in 2006, all of the mass public shooters have been male. Nearly two thirds have been white, whereas roughly one fifth have been African-American. The average age among mass public shooters is 35. Nearly 80% were under the age of 45 at the time of the attack.

While not all mass public shooters have a history of mental illness, a little more than 60% had been either diagnosed with a mental disorder or demonstrated signs of serious mental illness prior to the attack. This rate is more than

Table 2.1 A description of mass public shootings.

<i>Metrics</i>		
Average number killed	6.47	
Average number wounded	4.89	
<i>Number of offenders</i>	<i>Number</i>	<i>Percentage</i>
Single offender	153	95.6
Multiple offenders	7	4.4
<i>Type</i>		
School	14	8.8
Workplace	50	31.2
Other	96	60
<i>Gender</i>		
Male	159	99.4
Female	1	0.6
<i>Race/ethnicity</i>		
White	101	63.1
African-American	30	19.6
American Indian	1	0.6
Asian	10	6.3
Hispanic	11	6.9
Missing	7	4.4
<i>Age categories</i>		
Younger than 25	37	23.1
25–34	40	25
35–44	46	28.8
45–54	15	9.4
55 and older	10	6.3
Missing	12	7.5
<i>Mental illness</i>		
Yes	97	60.6
Paranoid schizophrenia	61	59.8
Mood disorder (depression)	33	32.4
Other mental illness	8	7.8
Unknown	63	39.4
<i>Precipitating event</i>		
Yes	107	66.9
Unknown	53	33.1
<i>Threats (verbal or written)</i>		
Yes	49	30.6
No or unknown	111	69.4
<i>Outcome</i>		
Arrested	74	46.3
Suicide	60	37.5
Killed by police/civilians	26	16.1
<i>Total</i>	160	

three times higher than the 12-month prevalence rate of any mental illness among adults and about 15 times higher than that for serious mental illness (Substance Abuse and Mental Health Services Administration, 2013). Of these mentally ill mass public shooters, roughly one third sought or received mental health care prior to the attack. As shown in Table 2.1, paranoid schizophrenia has been the most common mental disorder, followed by depression.

Perhaps as a consequence of the relatively high rate of mental illness and, more narrowly, paranoid schizophrenia, mass public shooters often believe they have been persecuted. For the vast majority of mass public shooters, the attack is an act of vengeance against those whom the shooter holds responsible for his or her perceived mistreatment. Because mass public shooters generally feel as though others are out to get them, it is perhaps unsurprising that they are often distrustful and socially isolated, which may help explain why they are frequently characterized as “loners” (Duwe, 2007).

Contrary to popular perception that these offenders “just snap,” mass public shootings are usually preceded by a great deal of planning and deliberation. As mass public shooters ruminate over the idea of exacting revenge and begin devising plans for their attack, they sometimes communicate threats either verbally or in writing. As shown in Table 2.1, at least 31% made some form of violent threats beforehand. Even though mass public shooters often spend weeks, months or years contemplating the attack, roughly two thirds experience a traumatic event – typically the loss of a job or an important relationship – that ultimately precipitates the violence.

When mass public shooters carry out the attack, they are more likely to target strangers than other mass murderers (Duwe, 2007). After the shootings, more than half of mass public shooters commit suicide or force others (mostly police) to kill them. The rate of suicidal behavior among mass public shooters is nearly double the rate for other mass killers and more than 10 times higher than that observed for homicide offenders in general (Duwe, 2007).³ The high suicide rate may be due to the fact that many mass public shooters are tormented individuals who want to put an end to their life of pain and misery, but only after evening the score with those who were, in their minds, the sources of that pain and misery.

Conclusion

In this chapter, I presented evidence that the incidence of mass public shootings began to increase in the mid-1960s. Following higher rates of mass public shootings during the 1980s and early 1990s, rates were lower from the mid-1990s to the mid-2000s. Since 2005, mass public shooting rates have been similar to what they were in the 1980s and early 1990s. Moreover, the data suggest that mass public shooters, on average, have a history of mental health

difficulties, are suicidal, and are socially isolated males who make violent threats and have suffered the loss of an important relationship or recently experienced failure at work or school.

Implicit to the debate over recent trends in the prevalence of mass public shootings is whether their incidence and/or severity can be reduced. This debate has, for the most part, focused on gun laws. Both sides of the gun control issue have argued that tightening or loosening firearms laws would reduce mass public shootings. The available evidence, however, suggests that neither approach would likely have much impact. For example, when the incidence of mass public shootings began to increase during the 1980s and 1990s, rates of gun ownership were relatively stable (Duwe, 2007). On the other hand, results from a previous study I coauthored indicate that right-to-carry-concealed firearms laws do not have a significant deterrent effect on mass public shootings (Duwe et al., 2002).

With the surge in mass public shootings, especially since the 1980s, school and workplace policies have gradually evolved to better address threats and manage risk. While violent threats directed at classmates or coworkers are generally taken more seriously now, that has not always been the case. For example, on September 1, 1989, a disgruntled employee committed a workplace shooting at the Standard Gravure plant in Louisville, Kentucky, killing 8 and wounding 12. When Standard Gravure's employees heard gunfire that morning, they knew the offender had returned to make good on the violent threats he had been expressing for months (Holmes & Holmes, 1992). Before an offender killed five of his former coworkers in Florida in 1996, he had repeatedly threatened them by promising, "If you mess with my job, I will take you out" ("Florida Killer," 1996).

Since the 1990s, particularly after the Columbine incident, many schools and workplaces have adopted a series of security measures to reduce the incidence or severity of shootings, including the implementation of procedures for reporting and assessing threats that arise. Over the past decade, a number of school and workplace shooting plots appear to have been thwarted because threats were promptly reported to authorities. While it is difficult to know with certainty whether these foiled plots would have resulted in mass murder had the threats been ignored, it is possible that the greater overall vigilance towards threats has reduced, at least to some degree, the incidence of mass public shootings.

Mental health reform is another area that has recently come to the fore in the debate over mass public shootings. As we have seen, mass public shooters have a relatively high rate of serious mental illness, when compared to the general population. Of these mentally ill mass public shooters, a little more than one third sought or received mental health care prior to the attack. To be sure, some may cite this as evidence of mental health treatment's ineffectiveness. After all, there are well-known examples in which mass public shooters had received treatment but nevertheless went on to commit mass murder. While improvements can almost certainly be made in the assessment of risk and treatment of those who

come to the attention of mental health care professionals, the rate of untreated serious mental illness points to what is perhaps a bigger problem – a high treatment gap among mass public shooters. Indeed, roughly two thirds of the mentally ill mass public shooters did not receive the care they needed. A gap of this magnitude, however, is merely consistent with research showing higher rates of untreated serious mental illness for males (who have committed nearly all of the mass public shootings in this country) compared to females (Pattyn, Verhaeghe, & Bracke, 2015) and, more broadly, for the United States relative to most other Western countries (Kohn, Saxena, Levav, & Saraceno, 2004).

The calls for changes in gun laws, heightened security at schools and workplaces, and mental health reform have, to some extent, been rooted in the idea that mass public shootings have been on the rise. Because problems demand solutions, these proposals stand a better chance of being implemented when the problem – in this case, mass public shootings – is claimed to be increasing or getting worse. But the effort to call greater attention to the putatively growing threat of mass public shootings obscures evidence that may (or may not) be helpful in identifying ways to reduce this type of violence. That is, trying to understand why mass public shootings have recently increased, even if only modestly, may not be the best question to ask. Rather, what truly needs explaining is why the 1950–1965 period had fewer mass public shootings than any other time during the past 100 years. Similarly, why was the rate lower during the 1994–2004 period than at any other time during the past 40 years?

Determining why mass public shootings dropped during these two periods may shed light on whether it is possible to curb this type of violence in the future. The most recent dip in the mass public shooting rate started at about the same time that crime in general began to fall. The late 1990s and early 2000s also coincided with a bustling economy, a rising prison population, increases in the number of police, a fading crack cocaine epidemic, the aging of the baby boomers beyond their peak crime years and, perhaps most interestingly, a federal ban on assault weapons. As with crime in general, assault weapons are seldom used in mass killings or, even more specifically, mass public shootings (Duwe, 2007). Moreover, what little research exists on the assault weapons ban suggests it had a minimal short-term impact on gun violence (Koper & Roth, 2001, 2002). Nevertheless, the question of whether the assault weapons ban had an effect on the incidence and/or severity of mass public shootings has yet to be answered empirically.

As the public debate continues over whether mass public shootings have increased and what can be done to prevent their occurrence or reduce their severity, an important fact remains that bears repeating – mass public shootings are, fortunately, very rare. Emphasizing their rarity does not diminish the enormous impact they have on perceptions of public safety. Nor does it alter the fact that mass public shootings are rather costly to society. It has been estimated, for example, that one murder costs society somewhere between

\$9 million and \$17 million (Cohen & Piquero, 2009; DeLisi et al., 2010; McCollister, French, & Fang, 2010). When we consider that the average number of victims killed in a mass public shooting is 6.5, the average monetary cost to society is, at a minimum, anywhere between \$59 and \$111 million. Moreover, given that the average number of victims wounded – often very seriously – in mass public shootings is 5, the societal cost is likely millions more per incident. Thus, regardless of whether mass public shootings have been on the rise, they warrant attention and scrutiny simply due to the devastating impact one incident can have at the individual, local, and national levels.

Still, the infrequency with which they occur makes it very challenging to accurately predict who will commit a mass public shooting or to develop policies designed to reduce their incidence or severity (see Chapter 6 for more on the prediction of dangerousness). As Fox and DeLateur (2014) rightly point out, it is unrealistic to assume that any of the policy proposals that have been advanced would, individually or collectively, prevent a catastrophic shooting from ever taking place in the future. But these proposals, if implemented, could have a broader impact on crime, including violent offending. At the same time, it is worth remembering that long-term trends in the prevalence of mass murder tend to mirror those for crime and violence. The broad social forces or policies that are effective in reducing crime may thus have a similar, albeit less direct, effect on mass public shootings.

Notes

- 1 In both instances, I shared the mass murder dataset I had assembled as well as the methods I used in constructing the dataset with *USA Today* and CRS staff.
- 2 In my 2007 book, I briefly review some mass murders that took place prior to 1900 in the United States. In this admittedly superficial review, I did not identify any cases that fit the description of a mass public shooting. This is not to say that the 1915 Brunswick case is the nation's first mass public shooting, or even the first one in the twentieth century. Rather, the Brunswick case is simply the oldest mass public shooting I have been able to identify.
- 3 We also see a similarly high rate of suicidal behavior among mass murderers who kill their families. In contrast, the offenders in felony-related massacres seldom commit suicide or force others to kill them. The rate of suicidal behavior in felony-related mass killings is similar to that observed among homicides in general.

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Explaining Mass Shootings

Types, Patterns, and Theories

James Alan Fox and Jack Levin

The literature of abnormal psychology features a plethora of case studies analyzing the backgrounds and mindsets of individuals who slaughter family members, massacre coworkers, or kill indiscriminately (e.g., Abrahamsen, 1973; Lunde, 1976; Macdonald & Mead, 1968). Indeed, much of the conventional wisdom concerning mass murder was for years grounded in some of the most extreme and bizarre cases, especially those for which mental health professionals were consulted or asked to testify in criminal trials invoking the insanity defense.

By contrast, researchers in criminology and criminal justice have long all but ignored the topic (for notable exceptions see Duwe, 2007; Levin & Fox, 1985). Some may have regarded mass murder as merely a special form of homicide, explainable by the same theories applied to more commonplace incidents and not deserving of special treatment. Others may have conceded multiple homicide to be largely a psychiatric phenomenon, perpetrated by individuals who suffer from profound mental disorders, and therefore, best understood with theories of psychopathology.

Still other criminologists may have assumed that such incidents were not only aberrational, but so rare as to be unworthy of extensive empirical research, despite the fact that there were, on average, more than two mass killings a month in the United States. That posture has changed in the past few years, however, especially in 2012 when two of the most horrific massacres occurred. The moral panic and sense of urgency surrounding mass murder, and mass shootings in particular, have been fueled by various claims that they are reaching epidemic proportions. For example, the Mother Jones news organization, having assembled a database of public mass shootings from 1982 through 2012, reported a surge in incidents and fatalities, including a spike in and record number of casualties in 2012 (Follman, Pan, & Aronsen, 2013).

In advance of any attempt to measure trends in mass shootings and the reported increase, we must settle on a working definition of such violent

episodes. Regrettably there has been considerable disagreement over the inclusion criteria of what constitutes a mass shooting, leading to confusion concerning patterns and trends.

As discussed in Chapter 1 of this Handbook, there has been some debate over the minimum body count in defining mass murder. We prefer to maintain the once standard minimum of at least four people killed, not counting the perpetrator. The most contentious disagreement among researchers surrounds the criteria for what constitutes a massacre. For example, many researchers have narrowly defined mass murder as those events that occur in public places by an assailant who kills his targets at random. As a result, these scholars eliminate from consideration, for example, robberies shrouded by executing all witnesses. The same holds true for gang-related murders, even though their victims are killed in a violent manner similar to more random acts that involve killing individuals while they shop, sit in a classroom, or go to a cinema.

Several studies of mass murder (e.g., Cohen, Azrael, & Miller, 2014; Follman et al., 2013) have also excluded family annihilations, even those with double-digit death tolls, ostensibly because they occur in a private setting where nonfamily members can feel safe from violence. Another possible reason is more psychological; many people believe they can anticipate and control what happens in their own homes and thus are more unnerved about crimes committed by strangers than by intimates.

Trends in Mass Shootings

It is important to note, at the outset, that the reported increase in mass murder, and particularly mass shootings, only holds for the highly restricted class of cases identified by Mother Jones – specifically, random shootings in public places not involving robbery. Conversely, an analysis of mass shootings that includes all types of incidents drawn from the FBI's Supplementary Homicide Reports (SHR) ranging from 1976 to 2012 fails to show an increase (see Fox & DeLateur, 2014).

Without minimizing the pain and suffering of the hundreds who have been victimized in recent attacks, the facts say that there has been no rise in mass shootings and certainly no epidemic. What is abundantly clear from the full array of mass shootings is the significant volatility in the annual counts. There have been several points in time when journalists have speculated about a possible epidemic in response to a flurry of high-profile shootings. Yet, these speculations have always proven to be premature when subsequent years reveal more moderate levels. The year 1991, for example, saw a 35-year-old gunman kill 23 people at a cafeteria in Killeen, Texas and a disgruntled graduate student murder five at the University of Iowa, along with other sensationalized incidents. The surge in mass killings that year was so frightening that a rumor

spread throughout the nation that there would be a mass murder at a college campus in the Northeast on Halloween (Farrish, 1991). Fortunately, October 31 came and went without anything close to a massacre taking place.

Although the SHR is the most consistent and long-term source of data on multiple victim homicide, it certainly has issues in terms of accuracy. Some cases are missing because of noncompliant reporting agencies. Also, some small jurisdictions have inappropriately included all of their homicides for the year in one record, making it appear as if there had been one incident with multiple victims.

A team of analysts at *USA Today* methodically verified each and every SHR mass murder incident, those by gunfire as well as those involving other weapons of mass murder destruction (e.g., knife), from 2006 onward, and filled in missing cases based on news reports (Overberg, Hoyer, Upton, Hansen, & Durkin, 2013). Unfortunately, extending the data verification and augmentation further back would have been especially challenging. These data, although limited to a decade time frame, show no increase in mass killing, and mass shootings in particular.

Finally, with the attention on mass shootings largely driven by the debate over gun control, it is important not to lose sight of the many incidents (i.e., nearly one third of the mass murders reflected in the SHR) that involve weapons other than firearms (e.g., knife). However, consistent with the theme of this Handbook, we will analyze and discuss only mass shootings with four or more victims killed.

Characteristics of Mass Shootings

Although it does not span as long a time frame as other databases, including the Mother Jones collection and the SHR, the *USA Today* database of mass shootings features a high level of completeness (i.e., case inclusion) and accuracy (i.e., data quality). These data, therefore, offer an unparalleled opportunity to explore the characteristics of mass shootings as well as the offenders and victims involved. From 2006 through 2014, there were 200 incidents in which at least four people were murdered, involving a total of 246 assailants. Overall, 15% of the shooting sprees were perpetrated by more than one individual, while nearly three quarters of felony-related massacres (typically murders to cover-up robbery or other criminal enterprise) involved two or more accomplices. Finally, the 200 mass shootings claimed the lives of 1,009 victims, in total, not counting perpetrators who committed suicide or were killed by the police or a bystander.

This pool of incidents, offenders, and victims is certainly ample for deriving a clear picture of patterns, even though only 9 full years of data are available. The nature of the crime has not changed dramatically in recent decades, as analyses of the somewhat flawed SHR data would suggest (see Fox & Levin, 2015).

Table 3.1 displays the overall counts of cases, offenders, and victims for each of the years since 2006. Not only do the figures fail to reflect the reported increase over time, the trajectory, albeit short-term, is actually downward. Of course, the discrepancy between this short-term trend and the rise in cases reported by others, such as Mother Jones, may be due to the difference between examining all mass shootings (as we do here) as opposed to only those cases that meet some criteria for a more or less random, public massacre. In fact, as shown in Table 3.2, half of the cases in the *USA Today* database are family annihilations, typically committed behind closed doors, not in public spaces where bystanders may be targeted. Still, the 35 public massacres in this database are spread over the 9-year time frame with no apparent trajectory. Noteworthy as well is that since the six episodes occurring in 2012, which included the Aurora cinema shooting and the Sandy Hook school massacre, the number of public slaughters has diminished.

Table 3.1 Counts of incidents, offenders and victims.

<i>Year</i>	<i>Incidents</i>	<i>Offenders</i>	<i>Victims</i>
2006	24	34	112
2007	20	23	120
2008	27	41	125
2009	24	30	130
2010	19	28	89
2011	24	24	115
2012	20	22	123
2013	24	24	112
2014	18	20	83
<i>Total</i>	<i>200</i>	<i>246</i>	<i>1009</i>

Table 3.2 Case counts by incident type.

<i>Year</i>	<i>Incident type</i>				<i>Total</i>
	<i>Family</i>	<i>Felony</i>	<i>Public</i>	<i>Other</i>	
2006	7	5	4	7	23
2007	8	2	3	7	20
2008	12	5	5	5	27
2009	15	2	4	3	24
2010	11	2	2	4	19
2011	17	1	4	2	24
2012	8	3	6	3	20
2013	9	4	4	4	21
2014	11	1	3	3	18
<i>Total</i>	<i>98</i>	<i>25</i>	<i>35</i>	<i>38</i>	<i>196</i>

Table 3.3 Region of occurrence by incident type.

<i>Region</i>	<i>Incident type</i>				<i>Total</i>
	<i>Family</i>	<i>Felony</i>	<i>Public</i>	<i>Other</i>	
Northeast	3%	16%	14%	11%	8%
Midwest	26%	40%	17%	34%	28%
South	50%	40%	23%	34%	41%
West	21%	4%	46%	21%	24%
<i>Total</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>
<i>Count</i>	<i>98</i>	<i>25</i>	<i>35</i>	<i>38</i>	<i>196</i>

Table 3.3 displays a breakdown of incidents by geographic region. Over 40% of the mass shootings occurred in the Southern states, which may relate to the region's lenient gun restrictions and high level of gun ownership. However, this percentage is only slightly higher than the 37% of U.S. population residing in the South. The Midwest is considerably overrepresented, with 28% of mass shootings occurring there but a population that is only 17% of the nation. This may have much to do with the high unemployment rates that hit this region hard during those years. The Northeast had only 8% of the massacres, well below the 18% of population that resides there. Finally, 24% of mass shootings occurred in the West, which is in line with its 23% share of the U.S. population.

There are some significant differences in the geographic patterns across the incident types ($\chi^2(9) = 27.302, p < .001$). The overrepresentation of the South is even greater among family massacres, which may in part be a function of larger family sizes so that the victim threshold of four would be more easily met and therefore the event would be considered a mass murder. Also, even though the total count is relatively small, the West had nearly half the public shootings. Public massacres often involve an assailant who moved west as a last chance for success, yet ultimately had to confront the difficult reality of continued failure. Many of these cases end with the dispirited perpetrator taking his or her own life. In fact, over half of the family massacres and public shootings result in suicide. This is in sharp contrast to felony-related cases in which almost none of the offenders commit suicide. Rather, they consider murder as a necessary cover-up for survival and the opportunity to enjoy the profits derived from their crimes.

Demographic characteristics of the assailants, specifically age, sex, and race, are presented in Table 3.4, where there are some significant differences in these distributions across the incident types. As shown, those who target family members tend to be older than single-victim murderers, reflecting the prevalence of middle-age men slaughtering their romantic partners (or ex-romantic partners) and their children. This is also true of assailants who commit mass

Table 3.4 Offender characteristics by incident type.

<i>Characteristic</i>	<i>Incident type</i>				<i>Total</i>
	<i>Family</i>	<i>Felony</i>	<i>Public</i>	<i>Other</i>	
Average number of perpetrators	1.1	2.2	1.0	1.4	1.3
Age					
Under 18	3%	8%	3%	0%	3%
18–29	32%	58%	37%	52%	43%
30–49	56%	34%	51%	46%	49%
50 and up	9%	0%	9%	2%	6%
<i>Total</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>
<i>Count</i>	<i>101</i>	<i>53</i>	<i>35</i>	<i>46</i>	<i>235</i>
Sex					
Male	94%	94%	94%	94%	94%
Female	6%	5%	6%	6%	6%
<i>Total</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>
<i>Count</i>	<i>102</i>	<i>56</i>	<i>35</i>	<i>47</i>	<i>240</i>
Race					
White	50%	11%	63%	33%	39%
Black	31%	66%	14%	44%	39%
Hispanic	13%	20%	9%	8%	13%
Other	7%	4%	14%	15%	9%
<i>Total</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>
<i>Count</i>	<i>91</i>	<i>55</i>	<i>35</i>	<i>39</i>	<i>220</i>

murder in a public place (including their current or former workplace), often following a prolonged history of frustration and failure. By contrast, felony-related incidents involve perpetrators who tend to be under the age of 30, consistent with the age pattern of felons, in general. Overall, these differences in age distribution are significant ($\chi^2(9) = 21.832, p < .01$).

Differences in gender distribution across incident type are virtually non-existent ($\chi^2(3) = 0.05, p = .997$). Of course, men predominate in all categories of mass murder, constituting almost 95% of the assailants. This is consistent with murder as a whole, as men represent 90% of murderers. But, among mass killers the gender ratio is even more uneven. Men tend to be far more comfortable with firearms, and more apt to see them as a means to resolve their grudges against others or society.

In terms of race, whites and blacks constitute equal shares of assailants (i.e., each just below 40%), with Hispanics and other races (i.e., primarily Asians) each representing around 10%. The race patterns diverge significantly by incident type, however ($\chi^2(9) = 44.940, p < .001$). Half of the family killings are perpetrated by whites, while two thirds of the felony-related cases implicate black offenders.

Table 3.5 Victim characteristics by incident type.

<i>Characteristic</i>	<i>Incident type</i>				<i>Total</i>
	<i>Family</i>	<i>Felony</i>	<i>Public</i>	<i>Other</i>	
Average number of victims	4.6	4.5	7.7	4.2	5.0
Age					
Under 18	42%	22%	13%	15%	27%
18–29	19%	39%	28%	38%	27%
30–49	23%	19%	24%	41%	26%
50 and up	17%	20%	34%	7%	21%
<i>Total</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>
<i>Count</i>	<i>439</i>	<i>110</i>	<i>270</i>	<i>159</i>	<i>978</i>
Sex					
Male	44%	53%	51%	62%	50%
Female	56%	47%	49%	38%	50%
<i>Total</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>
<i>Count</i>	<i>450</i>	<i>112</i>	<i>270</i>	<i>161</i>	<i>993</i>
Race					
White	54%	35%	71%	54%	56%
Black	22%	47%	3%	32%	21%
Hispanic	17%	13%	12%	12%	14%
Other	7%	5%	14%	2%	8%
<i>Total</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>
<i>Count</i>	<i>358</i>	<i>85</i>	<i>210</i>	<i>132</i>	<i>785</i>

The characteristics of victims slain in mass shootings are displayed in Table 3.5, across the various incident types. As shown, the average death toll from mass shootings was 5.0 victims, although public massacres averaged as many as 7.7 victims. In part this reflects the larger pool of potential victims typically present in public places, but is also skewed upward by a few exceptionally deadly events, including shootings at Virginia Tech in 2007 (32 deaths) and at Sandy Hook (26 deaths) in 2012.

The demographic patterns among victims are largely a function of the offender characteristics discussed above, reflecting the fact that mass killers generally do not select their victims at random, but usually target particular people for specific reasons.

The age breakdown among victims is fairly evenly spread across the four age groups, but not so in all situations ($\chi^2 (9)=148.314$, $p<.001$). In family massacres, children represent 42% of those killed, owing to the generational composition of families, including extended kin. The gender split among victims is exactly even overall, and close to even within all categories of incident type. The differences across these categories are significant ($\chi^2 (3)=16.283$, $p<.001$), but mostly due to the large sample size.

Finally, the racial composition of victims differs significantly by type of incident ($\chi^2(9) = 101.135, p < .001$). The majority of victims in family massacres are white, while the majority in felony-related incidents are black. These figures are relatively close to the racial make-up of perpetrators, consistent with the usual intraracial pattern observed in homicide. The racial distribution of victims killed in public shooting sprees is quite different from the other types of incidents. The large representation of white victims (over 70%) reflects the demographic make-up of Americans at most schools, shopping malls, restaurants, and other public locations.

A Typology of Mass Shootings

As in most of the social and behavioral sciences, researchers often struggle to create typologies or taxonomies to help explain behavior. When a heterogeneous phenomenon, such as mass murder, is addressed as a singular concept, it can be difficult to make sense of widely differing patterns of behavior.

Of course, the goal of creating mutually exclusive classifications is virtually impossible. The motivation-based typology we propose, not unlike other typologies before it, contains an unavoidable degree of overlap among its categories (e.g., a power-obsessed pseudocommando who massacres his coworkers to avenge perceived mistreatment at the workplace).

Power

The thirst for power and control has inspired many mass shooters, particularly the so-called pseudocommando killers who typically dress in battle fatigues and embrace symbols of power, including military-style rifles (Dietz, 1986). Yet the motive of power and control also encompasses what earlier typologies have termed the “mission-oriented killer” (Holmes & Holmes, 1994), whose crimes are designed to further a cause. Through killing, the perpetrator claims an attempt to rid the world of filth and evil, such as by killing marginalized groups. The larger his body count, the better he feels about himself. Having been regarded as weak and powerless in the past, he finally has the upper hand. He is the one who decides who lives and who dies.

In May 2014, a 22-year-old man killed 6 and injured 14 others in and around the California town of Isla Vista, in proximity to the campus of the University of California at Santa Barbara. The assailant blamed women and the men with whom they had relationships for his lack of appeal to members of the opposite sex and his continuing virginity. In his rambling 107,000 word manifesto, he wrote about feeling inferior compared to “all of those guys who walked around with beautiful girls.” Women must be punished for rejecting him, he wrote, and popular men must be punished for enjoying their lives while he suffered “in lonely virginity.”

By the age of 17, the perpetrator had already believed that his destiny in life was “to rise to power.” He often fantasized about becoming powerful and inflicting pain and suffering on the men and women who had wronged him. “I will be a God,” he wrote. After arming himself and waiting for the optimal moment to attack, he finally got what he had wanted. His new sense of power can be seen by him saying “Who’s the alpha male now, bitches?”

Revenge

Many mass shootings are motivated by revenge against specific individuals or groups of people, or society at large. Most commonly, the murderer seeks to get even with people he knows – such as his estranged romantic partner and all of their children or the boss and all of his or her employees.

In discussing family homicide, Frazier (1975) described the concept of “murder by proxy,” in which victims are chosen because they are identified with a primary target for revenge. Thus, a man might slaughter all of his children because he sees them as an extension of his romantic partner or ex-partner. In 1987, for example, an Arkansas man massacred his entire family, including his grandchildren, to avenge rejection by his wife and an older daughter with whom he had an incestuous relationship.

Frazier’s concept of “murder by proxy” can be generalized to crimes outside the family setting, particularly in the workplace or in schools. In 1986, for example, a disgruntled letter carrier murdered 14 fellow postal workers in Edmond, Oklahoma, in an effort to eliminate everyone who he associated with his boss and the post office generally. The assailant in the 2012 Sandy Hook massacre was also apparently motivated by revenge. This 20-year-old had nothing against the first graders he killed, but they seem to have been proxies for his classmates who had tormented him years earlier when he was a student there.

These crimes involve specific victims (or proxies) who are chosen for specific reasons. Some revenge multiple killings, however, are motivated by a grudge against an entire category of individuals, typically defined by race or gender, if not all of humankind, who are viewed as responsible for the killer’s difficulties in life (Levin & McDevitt, 2002).

In December 1989, for example, a 25-year-old man who blamed feminists for all of his failures in life, methodically executed 14 female engineering students at the University of Montreal. He specifically chose the engineering school where he would find women in roles traditionally controlled by men.

Loyalty

At least a few mass shooters are inspired to kill by a confused sense of love and loyalty – a desire to save their loved ones from misery and hardship. Certain family massacres involve what Frazier (1975) described as “suicide by proxy.”

Typically, a husband/father is despondent over the fate of the family unit and takes not only his own life but also those of family members, in order to protect them all from pain and suffering.

In January 2009, for example, a husband and wife lost their jobs as medical technicians at a local hospital in West Los Angeles. Unable to pay their mortgage and deeply in debt, they gave up any hope of finding another job that would allow them to take care of their five young children. Out of desperation and a misguided sense of love, the unemployed husband/father fatally shot his wife and children, and then took his own life. His suicide note read: “We don’t want to leave our children with a stranger.”

In certain dangerous cults, there exists a desire for loyal disciples to be seen as obedient to their charismatic leader. In an extreme case, a large number of men, women, and children, most relocating from California to the jungles of Guyana, were the victims of murder/suicide in November 1978 at the hands of a 47-year-old paranoid leader. Convinced that the federal government was out to destroy his cult, he demanded that his followers drink cyanide-laced Flavor-Aid. Many waited obediently in line to commit suicide. For those who refused, however, the deranged cult figure had his assistants shoot them to death. In total, 913 men, women, and children lost their lives, many by gunfire.

Profit

Some mass murders are committed purely or partially for the sake of financial gain. They are designed to eliminate witnesses to a crime, often a robbery. For example, in February 2008, a man who pretended to be delivering goods to the stores at a shopping center in a suburb of Chicago was able to gain entry into a Lane Bryant clothing outlet. His purpose was actually to commit robbery. At gunpoint, he took six eyewitnesses – four customers, a part-time employee, and a store manager – to the back of the store, where they were shot. Only the part-time worker survived his injuries. The killer’s identity was never determined.

Terror

A few mass homicides are, in fact, terrorist acts in which the perpetrators hope to send a message through violence. Some seek to change national policy; others attempt to eliminate a perceived enemy, either political or religious. They issue a more general warning that similar acts of terror can be expected to occur in the future.

In January 2015, for example, the offices of *Charlie Hebdo*, a satirical newspaper in Paris, France, was the site of a mass shooting perpetrated by two brothers who later identified themselves as belonging to a radical Islamic organization in Yemen.

Their motive was to stop cartoonists from depicting the Prophet Muhammad in a negative light. The gunmen shot to death 12 people and injured another 11.

Hate crimes are often also acts of terrorism in which a particular category of people is targeted. In August 2012, a 40-year-old Army veteran who identified as a white supremacist invaded a Sikh temple outside of Milwaukee and opened fire on the congregation inside. When the dust had settled, seven people had been shot to death including the killer. Not unlike many other Americans, the gunman might have mistaken Sikh Indians – based on their beards, turbans, and skin color – for Muslims. It is just as possible, however, that the perpetrator, the long-time leader of a white-power band named End Apathy, hated all nonwhite members of society.

Explaining Multiple Murder

It has long been popular among laypeople and professionals alike to seek the genesis of multiple murder within the psyche of the assailant. The more extreme the bloodshed and the more bizarre the motivation, the more apt we are to assume that the murderer is driven by compulsions symptomatic of some profound mental illness. However, theories and concepts to explain aspects of multiple homicide have emphasized the influence of environmental factors located in the family, economy, and society. Searching for variables associated with the most violent criminal behavior, researchers have investigated such factors as social learning, structural strain and frustration, everyday opportunities for victimization, as well as elements of self-control.

Social learning

Some individuals develop a propensity to kill from what they learn during their interactions with others. Early on, Sutherland (1939) proposed that criminal behavior is a result of associations with close friends and family member who reinforce positive attitudes toward criminality (as opposed to associations with those promoting more conventional attitudes). Decades later, Akers (2000) expanded this by recognizing that the influence of people who hold positive attitudes toward criminality varies depending on the frequency, duration, intensity, and priority of the interactions. Moreover, social learning is stronger when individuals perceive they are likely to be rewarded rather than punished for their criminal behavior. Akers also suggested that respected individuals often serve as role models for the initiation of criminality.

As recognized by Akers, not all of social learning comes from face-to-face relationships. Media images of infamous murderers have also served as role models for mass killers (Levin & Madfis, 2009). In July 2011, a Norwegian hate-monger took the lives of 77 people first by bombing a building in central

Oslo, and then by gunning down dozens of young people at a nearby summer camp of the Labour Party's youth wing. The killer's 1,500-page manifesto contained entire sections taken verbatim from the writings of Unabomber Theodore Kaczinski (Madfis & Levin, 2012).

Similarly the April 1999 Columbine massacre served as inspiration for several school rampage shooters (Larkin, 2007). In April 2002, for example, a 19-year-old man shot to death 13 teachers, 2 students, and 1 police officer in Erfurt, Germany. Police later discovered newspaper articles on his home computer about the two students who killed 12 schoolmates and a teacher at Columbine (Bondü & Scheithauer, 2010).

Strain Theory

In 1957, Robert Merton suggested that American culture stresses economic success without also emphasizing the opportunities necessary for attaining it. Members of society are urged to succeed economically even though many lack access to the structural means for improving their socioeconomic status. As a result, some Americans "innovate"; they act outside of conventional rules and seek to "get ahead" through criminal behavior.

In January 1993, for example, seven employees of Brown's Chicken Restaurant in Palatine, Illinois, were shot to death by two assailants who first robbed the fast-food restaurant. Using murder as a cover-up worked well, at least for some period of time. It took nearly nine years for the perpetrators to be apprehended.

Robbery is not the only strain-implicated motivation for mass murder. Some individuals who feel they have suffered profound economic failure seek to punish family members or coworkers whom they blame for their miseries. On December 26, 2000, for example, a 42-year-old employee of Edgewater Technology in Wakefield, Massachusetts killed seven coworkers after learning that his wages were to be garnished by the IRS through an arrangement with the company. Blaming his dire financial position on certain offices of the company, the vengeful gunman selectively targeted only those in the payroll and human resources departments.

Taking a broader view than Merton, Robert Agnew (1992) proposed his General Strain Theory whereby a range of negative experiences in social relationships at home, school, work, or in the neighborhood can lead to frustration, anger and, ultimately, to criminal behavior. Agnew identified several sources of strain, including the failure to achieve positively valued goals, the loss of social status, and the gap between aspirations and achievements.

Agnew's view of strain can help to explain why certain students would participate in a school rampage. Their successes are typically self-evaluated based not on the accumulation of money or excellent grades but on their popularity with peers. Rather than being accepted, almost all of them had been routinely

bullied, humiliated, or ignored by their schoolmates (Kimmel & Mahler, 2003; Larkin, 2007; Newman, 2007). Leary, Kowalski, Smith, and Phillips (2003) determined that chronic rejection of the shooters was present in at least 13 of the 15 school shooting cases they examined (Levin & Madfis, 2009).

Strain was clearly represented in the biography of the student at Virginia Tech who, in April 2007, committed mass murder on his campus. After migrating to the United States from South Korea, he was diagnosed with a severe anxiety disorder as well as depression. He also was pitifully shy and spoke English with a difficult-to-understand accent. Into the eighth grade, he was ignored by most students and bullied by others. His sense of rejection grew throughout his youth, leading up to his decision while a senior at Virginia Tech to get his revenge. Just weeks before graduation, he shot to death 32 students and faculty on campus.

Routine Activity Theory

Cohen and Felson's (1979) Routine Activity Theory suggests that everyday situations which provide opportunities for being victimized present more important causal factors than such social-economic conditions as poverty and inequality. For understanding mass murder, this aspect of routine activity may be particularly important. According to Cohen and Felson, appropriate targets must be available, effective guardians must be absent, and the perpetrators must be motivated to commit the offense.

Rampage shooters may be influenced in their choice of victims by elements of routine activity. They may be drawn to lecture halls, classrooms, theaters, and auditoriums in which large numbers of potential victims are congregated and literally under their gun.

In July 2012, a 25-year-old man made an Aurora, Colorado cinema his venue for amassing a large body count. His performance as a graduate student in neuroscience at the University of Colorado had deteriorated so sharply that he decided to leave school. Apparently wanting to maximize the carnage in response to what must have been a profoundly frustrating academic experience, he chose to open fire at a crowded midnight showing of a Batman film. According to Lott (2012), the perpetrator may also have been attracted to this particular venue because it was the only cinema in the state of Colorado where firearms were explicitly banned, assuring him of being the only one packing heat. Before the smoke cleared, 12 members of the audience were killed and 70 more were wounded.

Control Theory

According to Hirschi's (1969) Control Theory, attachment to conventional individuals and institutions tends to immunize human beings from committing violent offenses. Freud (1910) long ago argued that the presence of a superego

ensures that an individual will grow up having enough self-control to refrain from committing acts of extreme violence, including murder, even if he or she feels capable of avoiding punishment by the state.

When an individual lacks the internal controls, it becomes even more important that they reside in a network of significant others who are able to limit the propensity for violence. Many people refrain from engaging in violent behavior because they fear losing their relationships with others – family, friends, and peers. However, those who lack strong social ties may also lack the motivation to become law-abiding citizens. It is the person who has nothing to lose – who lacks attachments to others, does not make commitments to conventional behavior, and fails to adopt a belief in the moral appropriateness of the law – who is most likely to commit murderous acts.

Gottfredson and Hirschi (1990) emphasized the importance of parental love, supervision, and consistent discipline in the formation of self-control. Moreover, as noted by Sampson and Laub (1993), the ability of individuals to develop connections through stable informal bonds may protect them from committing criminal acts, including the most violent forms of homicides.

Certain mass murderers have exhibited a profound deficit with respect to social control. In April 2012, for example, a 43-year-old former student at Oikos University in Oakland, California opened fire on campus, killing seven and injuring another three. The South Korean native had relocated to the United States as a child. At the time of the attack, he was living in Oakland, apart from his family members. His mother had died a year earlier, one of his brothers remained in Virginia, and his second brother had recently been killed in an automobile accident. When he was expelled from the college, he was alone in what he saw as an exceptionally hostile environment. Any conventional forces that might have encouraged him to obey the law and reject violence were missing from his everyday life.

Biological predisposition

There may have been practical reasons for behavioral scientists over the past few decades to search for the roots of violent behavior in the social environment – namely, that the environment was amenable to both empirical investigation and intervention. In contrast, biological factors that might have been responsible for criminal behavior were regarded as fixed characteristics often beyond the reach of researchers and also not susceptible to change. There seemed to be little value in studying something that could not be modified.

Recently, however, behavioral scientists have broadened their research perspective by turning their attention to biological bases for criminal behavior, especially involving the perpetrator's brain. This recent increase in focus on the biological bases is largely due to the development of powerful imaging technologies that have made it possible to view detailed images of the human brain and

to trace activity along its neural pathways. For the first time, researchers were able to investigate the structure and functions of the brain in relation to criminal violence.

Biological factors likely play a role in the etiology of mass shooters. In December 1983, a 41-year-old Ohioan was down on his luck, enough so that he and his wife left their hometown of Massillon and relocated to San Ysidro, California – a suburb of San Diego. Only months after taking a job as a security guard, he was fired. Angry at the world, he grabbed his rifle, shotgun, pistol, and hundreds of rounds of ammunition and told his wife he was “going hunting for humans.” The determined gunman walked to the local McDonald’s restaurant, where he opened fire on employees and customers inside. Before the SWAT team fatally shot the assailant, he had killed 21 people, most of whom were Latino children.

Not unlike so many other mass shooters, the McDonald’s gunman seemed to fit a profile in which social and psychological factors played a key role. He had been chronically depressed, recently fired, and socially isolated by virtue of his move thousands of miles from family and friends. Moreover, he had access to firearms and knew how to use them.

According to Raine (2014), however, the perpetrator also may have been biologically predisposed to extreme aggression. Upon autopsy, a sample of his hair revealed extremely toxic levels of lead and cadmium commonly found in industrial workplaces and linked by research to violent behavior. For many years, the mass killer had worked as a welder where he would have been exposed routinely to toxic metals.

Some neurologists and a growing number of psychiatrists theorize that many violent individuals have incurred severe injury to the limbic region of the brain resulting from profound or repeated head trauma, typically during childhood. Psychiatrist Dorothy Lewis and neurologist Jonathan Pincus, for example, examined a group of murderers on Florida’s death row and found that they all showed signs of neurological irregularities (see Lewis, Pincus, Feldman, Jackson, & Bard, 1986).

There is considerable evidence that severe head trauma can have potentially dire effects on behavior, such as inducing violent outbursts, learning disabilities, and epilepsy. According to Allely, Minnis, Thompson, Wilson, and Gillberg (2014), at least 10% of all mass killers have suffered head trauma. Although hardly approaching a majority, these figures are much higher in individuals who display extreme forms of violence than in the general population.

Recent findings support the value to behavioral scientists of including variations in brain structure and function, in addition to other biological mechanisms, when they attempt to explain the development of extreme violence. At the same time, the biological approach does not preclude examining the environment for causal factors in the etiology of murderous behavior. Indeed, there is also evidence that elements of the brain change in response to changes in the environment.

Moreover, those individuals who have experienced a neurodevelopmental issue may have also suffered problematic environmental risk factors, such as parental divorce, abuse, or major surgery as children. There is a complex interaction between neurodevelopmental and environmental adversities which together can predispose an individual to become a mass killer. Of course, such a predisposition, even when strong, does not constitute predestination. No matter what and how strongly biological and environmental forces impact life choices, most individuals are able to remain morally and criminally responsible for their actions. See Chapter 5 for a more thorough discussion of the biological bases of the perpetration of mass shootings.

Discussion and Conclusion

Whatever the trends in multiple murder, the public perception is that these incidents are on the rise. To a great degree, this widespread belief is based on the extensive and expanded media exposure devoted to multiple murder. Aided by modern satellite technology, cable networks are able to provide marathon coverage of mass shootings even as the drama is still unfolding. Moreover, televised news and entertainment shows often feature biographical sketches of serial and mass murderers, capitalizing on the public's fascination with these high-profile criminals. Because of media overexposure, multiple murder can easily seem ubiquitous. See Chapter 7 for a more in-depth discussion of the impact of the media on the public's attitudes following mass shootings.

Fueled by dubious claims of an epidemic, the excessive and undue attention given to multiple murderers is often defended by citing a desire to understand the genesis of multiple homicide in order to identify would-be killers and intervene preventively. Although laudable, the expectation that we can avert carnage through scientifically guided prediction is misguided.

There are, of course, certain characteristics that are fairly typical among multiple murderers, including the demographic profile of white males often of middle age. Moreover, supported by the theories on causation, there are common patterns in the backgrounds of multiple murderers, such as head injury and childhood trauma, and key indicators, such as animal abuse and obsession with violent entertainment. However, because all these characteristics are somewhat prevalent in the general population, early identification is as challenging as finding a few needles in a massive haystack.

In the aftermath of multiple murder, it is easy to isolate warning signs that were apparently overlooked or ignored by family, friends, and even mandated reporters. These presumed telltale warning signs are actually yellow flags that turn red only after the blood has spilled. Hindsight is 20/20, whereas prediction is plagued by the exceptionally low base rate of multiple murder. See Chapter 6 for more on the difficulties associated with predicting dangerousness.

The distinction between troubled and troublesome is particularly important in dealing with warning signs. Once a distraught individual has become so angry that they make plans to kill a large number of victims, it is – in most cases – too late to intervene effectively. Most of the numerous grudge-holding individuals never commit a mass murder (Stone, 2015). While an individual is troubled but not yet troublesome, however, it may still be possible to intervene effectively with support and encouragement in order to improve the quality of life for a child who hates going to school but has not yet decided to get even.

Contrary to the widely held view, at least among laypeople, rather few mass killers suffer from schizophrenia or serious mental illness. Indeed, psychotic thinking tends to be found in purely random mass shootings, which are relatively rare. Not unlike millions of other Americans, mass murderers are far more apt to suffer from chronic depression stemming from repeated frustration. They are ill-equipped to deal with the stresses of daily life.

It would be a fitting legacy of mass murder if mental health services were expanded and improved. However, greater access to treatment options may not necessarily reach the few individuals on the fringes who turn a school, a shopping mall, or a movie theater into their own personal war zone. With their tendency to externalize blame and consider themselves as victims of mistreatment, mass murderers believe the problem resides in others, not themselves (Knoll, 2012). If urged or even coerced to seek counseling, the would-be mass murderer would likely resist angrily to the suggestion that something is wrong with him or her. He or she desires fair treatment, not psychological treatment (Fox & Levin, 2015).

In the aftermath of high-profile mass shootings, political leaders often rally to address the needs of the mentally ill. Unfortunately, this timing tends to stigmatize the vast majority of people who suffer from mental illness as if they too are mass murderers in waiting (see Barry, McGinty, Vernick, & Webster, 2013). However, no clear relationship between psychiatric diagnosis and mass murder has been established (Busch & Cavanaugh, 1986; Dietz, 1986; Taylor & Gunn, 1999).

The sudden initiative to aid individuals with psychological difficulties may be the right thing to do but for the wrong reason. For example, during an April 8, 2013 speech in Hartford, Connecticut delivered months after the Sandy Hook school shooting, President Barack Obama (Kliff, 2013) urged Congress to respond: “We need to help people struggling with mental health problems get the treatment they need *before it is too late*” (italics added). Our viewpoint is different: We should endeavor to help the mentally ill out of concern for their wellbeing, not just because we are worried about the wellbeing of those they might kill (Swanson, 2008).

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Part II

The Psychology of Perpetrators

The Development of Rampage Shooters

Myths and Uncertainty in the Search for Causes

Benjamin Winegard and Christopher J. Ferguson

In the days leading up to the shooting, the 14-year-old female shooter told half a dozen peers that she planned to “get” her former boyfriend and his friend at Spanaway Junior High School (McCarthy, 1985). On the fateful day, she retrieved a .22 caliber semiautomatic rifle from her parent’s home and brought it to school underneath a blanket. She confronted the two boys outside of the gym – both were members of the wrestling team. One of the boys stepped in front of the other to prevent her from shooting, but she shot both from close range and they succumbed to their wounds. The girl fled and roamed the community for nearly two hours before returning to the school where she killed herself. It was November 26, 1985 (Brown & Balter, 1985).

This girl was not a known disciplinary problem, described rather as quiet, friendly, and something of a practical joker. She was also a perfectionist who obsessed over grades and school activities (McCarthy, 1985). In the lead-up to the shooting, her grades slipped, she lost the race for vice president of the student body, and her “boyfriend” seemed uninterested in having a serious relationship – even though the “breakup” took place 6 weeks before the shooting. This lonely 14-year-old girl, desperate, slit her wrists, either in a suicide attempt, a cry for help, or both. She also visited the school counselors where she discussed her feelings of insecurity (Brooks, 1985).

This case, like many tragic cases of mass shootings, is perplexing, poignant, and disturbing. This 14-year-old girl seems similar in every way to many thousands of teenaged girls who suffer similar insecurities, breakups, and suicidal thoughts. What made her different?

Given the ubiquity of today’s media and a few recent high-profile mass shootings, it is not surprising that the study of such shootings is surging in psychology, sociology, education, and related disciplines. Nor is it surprising

that mass shooting coverage in the media has exploded with Twitter and other social media platforms providing “live coverage” of such shootings when they occur. One potentially important area of study is the developmental trajectory of mass shooters. Are there reliable developmental factors that allow us to predict who will become a mass shooter and who will simply suffer their mental duress and trauma without causing others harm?

This chapter will demonstrate that there are no reliable predictors. Mass shootings are such astonishingly rare, idiosyncratic, and multicausal events that it is impossible to explain why one individual decides to shoot his or her classmates, coworkers, or strangers and another does not. The most that can be offered are some vague generalizations: Shooters tend to be male; to suffer from mental illness; to have experienced recent social loss (romantic relationship or otherwise); to be sensitive to perceived slights and injustices; and many were influenced explicitly by previous shootings (Cullen, 2013; Larkin, 2009, 2013). While this might seem unduly pessimistic, we note on the positive side that there are some promising typologies of school and mass shooters that seem worth exploring and expanding upon. And, more importantly, many of the factors, such as violent media and video games, that are popularly assumed to lead to school shootings probably do not.

In this chapter, we first summarize previous research on the developmental antecedents and psychological traits of mass shooters. We next present a tentative model of violence and utilize it as a tool to account for the complex causal network that leads to mass shootings. Finally, we document some popular causal explanations of the development of mass shooters and detail that these should be treated with skepticism. Indeed, if our only contribution in this chapter is to convince the reader that we do not currently, and may not ever, possess the knowledge to make explicable the introductory case, this chapter will have served a useful purpose.

Previous Research on Mass Shooters

Conclusive evidence on mass shooting perpetrators is understandably difficult to come by. First, such shootings are rare, resulting in a very small initial population of perpetrators. Second, most mass shooters die during their crimes, either killed by law enforcement or suicide. Third, those perpetrators who do survive are scattered across multiple state or federal prisons, or forensic hospitals, with minimal access to outside scholars. Thus, psychological research on perpetrators often relies on “psychological autopsies” based on police reports and accounts of witnesses or surviving family members.

The most comprehensive early report on mass shootings was conducted in 2002, and focused specifically on shootings occurring at schools. Conducted by the United States Secret Service and Department of Education (Vossekuil, Fein,

Reddy, Borum, & Modzeleski, 2002), this report compiled several dozen psychological autopsies of past school shooters going back decades, including interviews with some who were still alive. Perhaps most striking in the results of this report was that no true “profile” of perpetrators emerged. Some common assumptions, such as the perpetrators came from broken homes, were heavy consumers of violent media, or were victims of extreme bullying, were not supported by the available evidence. Perpetrators did tend to view themselves as victims of perceived injustices (real or imagined), often had long-standing issues with anger, rage or resentment, and tended to display evidence of chronic mental health issues, although these often went unidentified or untreated prior to the shootings. The best preventative indication of mass shootings was not the development of a “profile” that could be used to screen and identify individuals far in advance of a shooting, but rather taking seriously and reporting to authorities vocalized threats by potential shooters.

Several other scholars have conducted post-hoc analyses of shooting events. Lankford’s (2013) analysis compared U.S. shooters to suicide terrorists and concluded that there were more similarities than differences between these groups. Fox and DeLateur (2014) also recently reviewed the literature on mass shootings and identified several myths that commonly develop about these events. These myths included false beliefs that mass shooting incidents are more common now than in the past, perpetrators “snap” suddenly when they commit their crimes, and exposure to violent media plays a causal role in such shootings (See Chapter 3).

Langman (2009) examined the case histories of 10 school shooters and concluded that they fit into three general categories. Traumatized shooters tended to come from difficult family backgrounds where they were subjected to intense abuse. Psychotic shooters had long-term difficulties with paranoia and psychosis-based disorders, such as schizophrenia or schizotypal personality disorder. Lastly, psychopathic shooters, like psychotic shooters, came from intact homes without abuse but displayed a profound lack of empathy. Langman (2013) has more recently updated his database to include 35 shooters and found that the threefold typology is applicable to the newly added cases. While Langman’s approach is a valuable discussion point, we note that, like all approaches, it has several limitations. First, it is built upon only a small number of cases ($n=35$). Second, as Langman noted, most individuals who have experienced any of the core features of the three categories (i.e., abuse, psychosis, or psychopathy) do not commit mass shootings. Lastly, categorical systems tend to emphasize the differences between shooters rather than find similarities between them.

One caution regarding mass shooting events is that these incidents are nationally traumatic and extremely high profile, which can lead to pseudoscientific public statements that support specific political agendas. Typically this takes the form of politicians demanding “studies” (often by national scientific bodies where they control the funding appropriations) while making clear, in advance, what results they wish the “study” in question to yield.

One remarkable example occurred after the 2012 Sandy Hook shooting in which a 20-year-old male killed 20 children and 6 adult faculty and staff at an elementary school in Connecticut. Because of the shooter's age, it was speculated that he might have been a frequent player of violent video games (e.g., KCCI, 2012). However, the official investigation report ultimately concluded that he was fonder of nonviolent games, such as *Dance, Dance Revolution*, than violent games (State's Attorney for the Judicial District of Danbury, 2013).

The shooting resulted in several calls for "research" into the alleged link between violent video games and gun violence, with the politicians who were calling for such research making it clear they intended to use it to attack the video game industry. Most of these efforts ultimately failed. However, one congressman, Frank Wolf, managed to persuade the National Science Foundation (NSF) to produce a dubious report on youth violence. Wolf was a very powerful member of Congress who chaired, among other things, the committee that oversaw funding for the NSF. Following the Sandy Hook shooting, Wolf asked the NSF to produce a report on youth violence. The NSF agreed and included as authors in that report two media scholars with a history of promoting exaggerated views linking media to extreme behavioral change. No scholars skeptical of media effects were invited to participate to balance out the report (Ferguson, 2014).

The NSF report eagerly linked video games and other violent media to mass shootings. To do so, the report selectively referenced mass shootings where perpetrators had played video games but ignored those that did not. The report also selectively reported research linking video games to aggression, while failing to report a single study, despite the existence of many, suggesting that violent video games or other media may not be linked to violence (Subcommittee on Youth Violence, 2013). The only exception was a 2008 meta-analysis by criminologist Joanne Savage that the NSF authors falsely claim linked violent media to violent crime even though Dr. Savage came to the opposite conclusion (Savage & Yancey, 2008). The report failed to mention that many mass shooters, young and old, did not consume violent video games or other violent media, nor did they mention any of the many studies that have contradicted their conclusions (Vossekuil et al., 2002). This example highlights the hazards of mixing politics, moral panics, the need for certainty, and science.

Difficulties in Identifying a Developmental Pathway

It appears that mass shooters tend to reach a remarkably consistent endpoint, marked by the combination of mental illness, psychopathic traits, severe depression, and resentment toward perceived injustices (Ferguson, Coulson, & Barnett, 2011). This endpoint appears to be reasonably similar

to suicide terrorists (Lankford, 2013). However, the developmental path to this endpoint remains, largely, mysterious.

This is, in part, because violent behavior is partly innate, and even adaptive under some extreme circumstances, but can be brought forth in maladaptive ways through genetic predispositions coupled with a nearly infinite array of environmental stressors. How these stressors impact individuals is idiosyncratic. For much of the twentieth century, it was thought that violence was a purely learned behavior, and this view continues to cause much confusion in discussions of mass shootings. We do not mean to suggest that learning is irrelevant to violence, rather that simplistic imitative learning is unlikely to be the core feature of violence. Rather, violence is a complex process arising from genetic predispositions, immediate family and peer influences, mental resiliency, and environmental stressors. Diathesis-stress models of violence, such as the catalyst model (Ferguson et al., 2008), suggest that both genetic predispositions and a harsh early environment most likely contribute to the development of personalities which are more prone to aggression and violence than others. Indeed, this basic observation has been well-supported in previous literature (e.g., Caspi et al., 2002).

Development of this aggressive personality results in an array of potential responses to external stimuli. Aggressive personalities are more likely to lean toward aggressive responses, but these can still be restrained by the brain's impulse control device, the prefrontal cortex, which is involved in foreseeing consequences and restraining maladaptive impulses. This impulse control device can, in turn, break down under some circumstances, including brain injury, but may also function less efficiently when more external stress is applied to the individual.

This model explicitly indicates that forces that have direct impact on the developing child are far more likely to be influential than peripheral forces (Figure 4.1). This comes most into play when assessing potential factors, such as media violence, which have little direct impact on a developing child's world

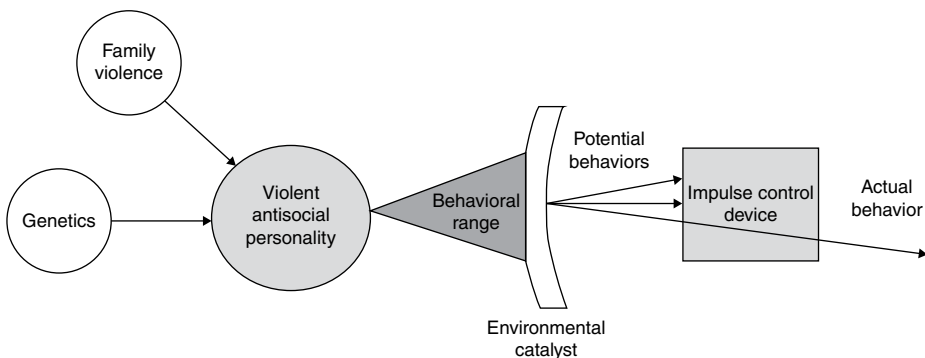


Figure 4.1 A catalyst model for violent antisocial behavior.

and, thus, are too distal to influence the developmental path to violence. That is to say, the developing child's mind treats real stimuli differently from that in a fictional universe.

This model tends to work well in understanding the developmental pathways toward most violent crimes, which are often linked to stress, abuse and neglect, depression, peer delinquency, and brain damage to the frontal lobes. However, with mass shootings, although some elements, such as stress and antisocial personality are present, there is less of a clear link to family abuse or neglect. Regardless, the presence of "grievance collecting" elements in most shooters may provide a key. Mass shooters typically view themselves as victimized and react disproportionately to such perceived grievances (Knoll, 2010b). It may be that mass shooters lack resiliency to perceived slights, neglect, or bullying that would have far less impact on developmentally typical individuals. The resultant lack of hope and feeling of social isolation thus become the element of abuse or neglect, which is a key feature of the catalyst model.

This process is consistent with those described in the most detailed case studies of shooters, and with broader research that suggests shooters delight in the fantasy of taking vengeance and in teaching their victims a lesson (Klein, 2005; Knoll, 2010a). In one case, a 30-year-old woman with a history of debilitating mental illness nursed grievances against nearly everyone she came into contact with, especially her ex-husband (Browner, 1988). Eventually, her desire to get even with her ex-husband and others who had wronged her led to a convoluted and almost nonsensical plan of revenge. In the course of her ill-conceived plan, this woman ended up shooting and killing a random 8-year-old boy and seriously wounding five others at a school in Winnetka, Illinois (Kaplan, Papajohn, & Zorn, 1990).

Purported Causal Factors That Are Not Supported

Violent video games and media

According to a 2013 Harris poll immediately after the Sandy Hook shooting (Harris Polls, 2013), 58% of Americans believed that the portrayal of violence in video games was related to violence in society. Polling Americans a few months later, Przybylski (2014) found an even split in opinions on video game influences. However, both polls also documented clear generational influences, with older adults and those unfamiliar with video games being far more likely to endorse causal effects. This causal effects view has been shared by some TV personalities and pundits, such as Dr. Phil McGraw (2007), who stated that "common sense" tells anyone that video games mixed with mental illness and rage lead to an explosive cocktail, as the "suggestibility is too high."

Interestingly, the National Rifle Association executive vice president, Wayne LaPierre, also agreed with this sentiment, when after the Sandy Hook shooting he asserted that violent video games were part of a “callous, corrupt, and corrupting shadow” industry that sows violence “against its own people” (Oremus, 2012). Perhaps more surprisingly, some scholars have echoed these alarmist pronouncements, comparing the relation of media violence and real-life aggression to the link between smoking and lung cancer (Strasburger & Grossman, 2001; Strasburger, 2007; Strasburger, Jordan, & Donnerstein, 2010). Other scholars have implicated violent video games as a contributing factor in mass shootings (Anderson & Dill, 2000).

Despite such assertions, there is no evidence to support the claim that violent video games are causally related to serious aggression, such as mass homicides and school shootings (Ferguson, 2008). In fact, there is minimal evidence that violent video games increase low-level aggression within the laboratory (Ferguson, 2007; Hall, Day, & Hall, 2011).

Several meta-analyses have been conducted on potential video game influences on milder aggression, relying particularly on studies involving WEIRD (i.e., Western, Educated, Industrialized, Rich, and Democratic) participants (Henrich, Heine, & Norenzayan, 2010). These meta-analyses have come to conflicting conclusions about potential effects. Two meta-analyses (Anderson et al., 2010; Greitemeyer & Mügge, 2014) came to the conclusion that violent games can have small but significant influences on mild aggression. However, both of these meta-analyses have been identified as problematic. Anderson et al. (2010) excluded numerous null studies from their analyses, resulting in spuriously high effects. Publication bias was also evident, but unreported, particularly in the “best practice” experimental studies (the majority of which were the authors’ own studies), where effect size and sample size correlated $r = -.503$ ($p = .007$), which is a potential indication of p -hacking and avoidance of null results. Greitemeyer and Mügge (2014) appear to have numerous fundamental problems with their meta-analysis, including the inclusion of studies with no violent/nonviolent control group, the inclusion of studies multiple times in a single analysis, the violation of homogeneity assumptions, and sloppy extraction of effect sizes. The authors also suggested that “neutral” studies agreed with causationists more than skeptics, but achieved this result by including numerous studies by causationists (including coauthors on Anderson et al., 2010) as if they were “neutral.”

Two other meta-analyses were more skeptical of video game influences. Sherry (2007) concluded that the weak effects seen were likely due to methodological shortcomings of the studies, which have been widespread. Sherry (2007) also noted that evidence that video games have more influence than other media due to their interactive nature was absent. Ferguson (in press), which focused on samples of children and adolescents, found little evidence of harmful effects for video games on aggression or mental health issues. Further,

studies in the Ferguson (in press) meta-analysis that employed citation bias (only citing research that supported the author's own views) were more likely to find effects than those that did not.

Other scholars have noted that correlational relationships are not observed between violent game consumption and violent crime or bullying over time in the United States, nor between game consumption and crime cross-nationally (Markey, Markey, & French, in press). Markey et al. (in press) also observed that releases of popular violent video games, such as the Grand Theft Auto series, is followed by immediate declines in violence, suggesting a causal effect related to declined societal violence. The authors explain this as a function of routine activities theory in which popular video games occupy the time of young males who might otherwise have engaged in violence.

However, such data are correlational and we do not intend to assert a causal link. Although correlation does not equal causation, absence of correlation is good evidence for absence of causation. Causal advocates often defend against this inconvenient data by noting that violence is multidetermined. We certainly agree that violence is multidetermined, but this counter explanation fails for three reasons. First, noting that violence is multidetermined does not mean video games need be one of those causes. Second, causationists often argue, on one hand, for violent games having dramatic impact on a par with smoking and lung cancer, causing up to 30% of societal violence (e.g., Strasburger, 2007), or being akin to global warming or Holocaust denial (e.g., Strasburger, Donnerstein, & Bushman, 2014). Yet when faced with inconvenient correlational data, whether from individual studies or from real-world data (e.g., Breuer Vogelgesang, Quandt, & Festl, in press; von Salisch, Vogelgesang, Kristen, & Oppl, 2011), such data are dismissed. Comparisons to smoking/lung cancer and global warming also are problematic, since the correlational data in those cases clearly are in the direction expected by causationist arguments (lung cancer increases in smokers; global warming has increased along with pollutant emissions.)

A third problem with the dismissal of societal crime data is that many scholars who dismiss current crime data either used them when crime rates were rising in the 1980s, or eagerly sift about for crime data that appear to support causal beliefs. One recent curious argument suggests well-established crime data should be ignored in favor of teen gun injury data from the Centers for Disease Control (Bushman, Romer, & Jamieson, 2015). They suggest that gun injuries among teens can be used to infer gun violence rates by teens. However, the CDC data appear to be unreliable, with wild fluctuations from one year to the next. Further, why infer teen gun violence rates from CDC injury data, when teen gun violence data from the Bureau of Justice Statistics (2013) already document a declining trend?

When it comes to mass shootings, belief in a link between these events and video games is a clear product of confirmation bias. When shooters are older

males (or more rarely, females), little attention is paid to video games. That is to say, few pundits or scholars take the time to point out that these older shooters did not play violent video games. Yet, video games are eagerly raised as an issue for young male shooters. This confirmation bias appears to intuitively capitalize on base rate behaviors. Because violent game play is ubiquitous among young males in the population, yet rare for older males, it is not surprising that young male shooters often played violent games. However, some cases of young male shooters, such as Sandy Hook or Virginia Tech, were found in official investigation reports to have little relation to violent games. Yet these exonerations often receive far less media attention than the initial speculation about video game influences.

Bad homes

Home life is the risk factor that laypeople blame most for mass shootings. In a 2001 Gallup poll (Moore, 2001), 92% of respondents asserted that home life, including relationship with parents, was “very/extremely” important in causing school shootings. Scholarly research on mass shooters has demonstrated that family-level variables, such as a lack of supervision, troubled relationships, and sexual/physical abuse, are significant risk factors that present themselves in mass shooters (Verlinden, Hersen, & Thomas, 2000; Langman, 2009). However, the Secret Service Report on school shootings (Vossekuil et al., 2002) noted that a majority of shooters (63%) came from two-parent families and case study research reveals that many shooters come from typical households (Cullen, 2009; Gibson, 1999; Langman, 2009, 2013). For example, the home life of the Sandy Hook shooter, while not idyllic, was far from abusive. The Sandy Hook shooter’s mother was doting and his socioeconomic status was above average (Griffin & Kovner, 2013a). Many of the issues that the family encountered were due to the shooter’s mental illness which placed strain on his mother (Griffin & Kovner, 2013b). The duress in the household appears to have been caused by the shooter rather than the parents, which is perhaps not uncommon, especially among adolescent shooters.

As the Sandy Hook case illustrates, assessing the impact of home life on the developmental trajectory of shooters is extremely difficult. The Red Lake shooter, for another example, suffered a traumatic childhood which included his father committing suicide after a standoff with the police and his mother suffering permanent brain damage from a car accident. It is tempting to grant causality to such traumatic events and to “explain” the shooter’s behavior by reference to his or her upbringing. But this simply invites the question of why hundreds of thousands of children who suffer similar or worse trauma do not commit heinous crimes as adolescents or adults (Widom, 1989). More disconcerting, many studies that assess the impact of home environment on subsequent outcomes (behavioral or mental) are not genetically informed and therefore are

incapable of demonstrating causality (Harris, 2007). When genetically informed studies are conducted, the family environment (or “shared environment” in behavioral genetic parlance) usually accounts for minimal variation in outcomes (Bouchard, 2004; Boutwell & Beaver, 2010; Wright, Beaver, Delisi, & Vaughn, 2008).

As we have illustrated above, the thread that seems to unite mass shooters is mental illness and perceived grievances. There is now a voluminous literature on the genetics of the mental pathologies that have been identified as prevalent in shooters (e.g., psychopathy, borderline personality, schizophrenia, bipolar, depression) and all of these disorders have a strong heritable component with little impact of shared environment (e.g., Bornovalova et al., 2013; Distel et al., 2008; Frick, Ray, Thornton, & Kahn, 2014; Larsson, Andershed, & Lichtenstein, 2006; Lichtenstein et al., 2009; Viding, Jones, Paul, Moffitt, & Plomin, 2008).

Although these results do not disprove the hypothesis that the home environment is an important causal factor in the genesis of mass shooters, they do suggest that skepticism is appropriate. It is worth noting that gene x environment interactions (GxE) may be one way in which the home environment exerts an influence on individuals who are particularly vulnerable to specific environmental stimuli (Kim-Cohen et al., 2006; see Figure 4.1). From this perspective, some individuals may be more vulnerable than others to traumatic events that occur in the household. Out of this subset, a very few are traumatized to the point where, in conjunction with other factors, they commit serious acts of violence (Caspi et al., 2002). This seems to be a plausible hypothesis and one worth exploring in greater detail. Currently, attempts to replicate GxE interaction studies have had limited success and GxE studies suffer from confounds that limit the conclusions one can draw from them (Duncan & Keller, 2011; Keller, 2014). However, there is little evidence that the home environment is a crucial causal factor and there is much evidence that it is irrelevant in the majority of mass shootings (Langman, 2013).

Bullying

Of all the purported factors that have been offered to explain mass shootings, especially at schools, bullying is the one that probably resonates as the most plausible and understandable to laypeople. According to the above mentioned Gallup poll (Moore, 2001), 62% of respondents thought bullying and teasing were “very/extremely” important as causal factors in school shootings. Most individuals can think of a time in their lives when they were bullied, teased, or harassed, and many have the memories of such incidents seared into their brains. Thus, it is not surprising that bullying is believed by many scholars and laypeople to be a major contributing factor in shootings. This belief is seemingly well grounded by careful case study research that has demonstrated that

the majority of school shooters were the victims of malicious bullying and teasing, especially pertaining to their sexuality and perceived lack of masculine traits (Kimmel & Mahler, 2003; Klein, 2012; Leary, Kowalski, Smith, & Phillips, 2003). Nevertheless, many shooters were not bullied and/or were themselves bullies (Langman, 2009; Meloy, Hempel, Mohandie, Shiva, & Gray, 2001). The 2013 Arapahoe High School shooter, for example, blamed teasing that occurred in elementary school for his subsequent psychological and anger issues, but was seen by others as a mercurial and difficult bully who was exceedingly arrogant (McCauley, 2014). Similarly, Cullen (2009) does not view the evidence as supporting that the Columbine shooters were bullied to any significant degree. Rather, Cullen views one of the shooters as a psychopath and the other as a seriously depressed individual seeking love, connection, and meaning.

Overall, researchers have found that bullying (defined as repetition, rejection, and unequal power) is surprisingly common, with some estimates that over 50% of students (ages 12–15 years) have been verbally bullied at least once in the past 2 months and 85–95% of LGBT and students with disabilities have experienced bullying (Swearer, Espelage, Vaillancourt, & Hymel, 2010; Wang, Iannotti, & Nansel, 2009). Other research estimates that bullying is less frequent, but still common, with estimates between 11 and 20% (Olweus, 2012; Salmivalli, 2010). There is strong evidence that both bullying and being a victim of bullying can lead to psychological and somatic distress including depression, self-harm, and, in extreme cases, suicidal ideation, and possibly suicide (Fekkes, Pijpers, & Verloove-Vanhorick, 2004; Hinduja & Patchin, 2010; Lereya et al., 2013). There is also an association between being a bully and antisocial outcomes later in life, but some controversy about whether being a victim of bullying leads to antisocial outcomes (Bender & Lösel, 2011; Ttofi, Farrington, & Lösel, 2012). Fortunately, we note, bullying incidents among youth appear to be declining, along with other forms of youth violence – although data on bullying have only been kept for approximately the past decade (Finkelhor, Turner, Ormrod, & Hamby, 2010; National Center for Education Statistics, 2015).

These facts, combined with case studies of shooters, seem to implicate bullying as a risk factor in school and other mass shootings. However, the case for bullying as a significant contributing factor in the developmental sequence of mass shooters is not as strong as it seems. It is difficult to explain how bullying could be an important cause of shootings when at least one fifth of all adolescents have been victims of bullying and only a miniscule fraction even contemplate shooting their peers. A counter to this argument is that any risk factor, whether mental illness or obsession with violence and weapons, leads only very rarely to a shooting. However, it is also the case that bullies and victims are not random individuals. For example, victims of bullying are likely to suffer from internalizing disorders, to lack social skills, and to be isolated; bullies are likely

to be externalizers who possess negative views of their school and community; and bully-victims (e.g., individuals who bully others and also report being bullied) are likely to be comorbid internalizers/externalizers who are socially rejected (Cook, Williams, Guerra, Kim, & Sadek, 2010). Because internalizing and externalizing problems are highly heritable, it is not surprising that bullying and victimization run in families (Allison, Roeger, Smith, & Isherwood, 2014; Ball et al., 2008).

To the extent that being a victim of bullying (or being a bully) interacts with other salient environmental phenomena and risk factors to create a heightened sense of alienation, rejection, and marginalization, it is possible that it contributes to mass and, especially, school shootings (Newman, 2013). We view it as more likely that it is a strong sense of injustice, desire for revenge and glory, and marginalization that is causally operative and that bullying or victimization simply serve as noncausal indicators that are often correlated with relevant factors, such as possessing low status, lacking social skills, having a mental illness, and being socially marginalized (Larkin, 2009). That said, we view bullying as worthy of much more study and scrutiny and find it more plausible as a causal factor than either violent video games and media or bad homes.

Conclusion

Mass shootings are extremely rare, traumatic, and little-understood events (Duwe, 2004; Shultz, Cohen, Muschert, & de Apodaca, 2013). However, because mass shootings can seemingly occur in any place (e.g., school, home, workplace) and at any time, they cause trauma and panic. Unfortunately, even with hundreds of scholars pouring through archives and official reports from well-funded agencies, we know very little about mass shooters. There does not seem to be a universal profile nor is there a typical shooter (Langman, 2013; Vossekuil et al., 2002). This should not be taken to mean that there are not general traits shared by mass shooters. Almost all of the shooters that have been studied in detail were male, exhibited evidence of mental illness, and perceived that they were treated unjustly in some way, whether metaphysically (e.g., by an unjust universe) or specifically by peers (Ferguson et al., 2011; Klein, 2005; Knoll, 2010a). Unfortunately, these general traits are also present in many hundreds of thousands of adolescents and adults who never harm another person.

It is arguably more important to dispel widely held myths about shooters than to proffer another imperfect typology or speculate about the causes of mass shootings. This might guard against harmful policies or scapegoating. As we have documented, there is little evidence to support the widely held belief that mass shooters are produced by “broken” homes or inattentive parents. In this chapter, we have also argued that excessive focus on bullying or violent media may lead to ineffectual policies. In conclusion, we urge caution and modesty among scholars and policy makers when examining potential explanations for mass shootings.

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Biosocial Perspective of Proactive Aggression

Applications to Perpetrators of Mass Shootings

Jonathan Waldron and Angela Scarpa

“To [...] decide whether there is a force in nature that causes crime, we must abandon the sublime realms of philosophy and even the sensational facts of the crime itself and proceed instead to the direct physical and psychological study of the criminal, comparing the results with information on the healthy and the insane” (Lombroso, 1876, p. 43). The Italian psychiatrist Cesare Lombroso’s words about what predicted violent behavior seem obvious today, but at the time, they were revolutionary. His research and writings, documented in *L’Uomo Delinquente* (*The Criminal Man*), are some of the earliest works highlighting the need to examine the role of biology in understanding predictors of violence. Lombroso examined the physical bodies of criminals, documenting characteristics from head circumferences to the distance between toes. While his claims have mostly been discredited, Lombroso suggested that to understand violent perpetration, one must examine the “physical and psychological study of the criminal” (p. 43).

This chapter seeks to examine biological and psychosocial variables, and how these factors may interact to inform our understanding of the proactive aggression seen in perpetrators of mass shootings. We will begin with an overview of several theories, including the biosocial model and its relationship to violence. We discuss various functional subtypes of aggression and how the biosocial model may help us understand proactive aggression. We finally suggest how the biosocial model can be used to understand mass shooting perpetration and offer suggestions for researchers

Biology and Aggression

Historically, biological predictors of violence have largely been ignored, and other theories, such as sociological theories (see Collins, 2009), have received much of the attention. Sociological theories emphasize learning principles and contexts, among other variables, in order to understand violent perpetration. Within the past few decades, the biological determinants of violence have once again become a focus of research (see Lorber, 2004; Scarpa & Raine, 2007) and researchers have begun questioning purely sociological theories. It should be noted that this is not a suggestion that sociological theories of violence are not informative. But, prior studies conducted on the biology of violence indicate it would be ill-advised to ignore the role of biological risk and protective factors.

Much of the early research during the biological resurgence involved animal aggression studies, which found promising results identifying biological indices of aggression (Moyer, 1976). Animal studies, however, were limited in their generalization to human behavior. Still, the need to examine how biology affects aggression was recognized. As one scholar wrote, “What seems no longer tenable at this juncture is any theory of human behavior which ignores biology and relies exclusively on sociocultural learning. Most scientists have been wrong in their dogmatic rejection and blissful ignorance of the biological parameters of our behavior” (van den Berghe, 1974, p. 779).

Biology clearly influences human aggression, antisocial tendencies, and criminal behavior (see Raine, 2013). While a full review of aggression antecedents is beyond the scope of this chapter, some biological factors that have been demonstrated include cardiac (Lorber, 2004; Ortiz & Raine, 2004; Portnoy & Farrington, 2015), electrodermal (Lorber, 2004), nutritional (Siegel & McCormick, 2006), hormonal (Raine, 2002), neurobiological (Rowe, 2001), and genetic (DiLalla, 2002) contributions. Importantly, these factors have been found to predict or increase the likelihood of aggression, but are not absolute determinants of aggression.

Cardiac measures, particularly resting heart rate, appear to be the best replicated biological correlate of aggression and antisocial behavior (Ortiz & Raine, 2004). Therefore, it will be of particular focus in this chapter. Several meta-analyses have found resting heart rate to be significantly related to antisocial behavior (Ortiz & Raine, 2004; Portnoy & Farrington, 2015), aggression and conduct problems, but not psychopathy (Lorber, 2004). Overall, the findings provide strong support of a relationship between heart rate and aggression, with a few minor differences based on the type of externalizing problems (e.g., psychopathy).

The cardiac-aggression relationship is important to point out, because arousal levels may serve to exacerbate or mitigate aggressive behaviors, beyond other difficulties a person may have (Ortiz & Raine, 2004). Higher heart rate

may serve to protect individuals from engaging in aggressive behavior. For example, Stadler and colleagues (2008) examined the relationship between heart rate and treatment outcome in children diagnosed with disruptive behavior disorders. Those with a higher resting heart rate had lower aggression compared to those with lower resting heart rate. Furthermore, resting heart rate was the only significant predictor of treatment outcome among these children.

On the other hand, a persistent low level of cardiac arousal indicated by low resting heart rate may exacerbate aggression. This theory, called the under-arousal theory (Eysenck, 1997), proposes that chronic low heart rate is extremely unpleasant. Subsequently, individuals engage in stimulating behaviors to increase arousal so that this discomfort is reduced. This may include stimulating behaviors such as skydiving, drag racing, or simply avoiding boring tasks. Relevant to this chapter, this unpleasant state of low arousal may lead an individual to become aggressive or violent (Raine, Venables, & Mednick, 1997; Wilson & Scarpa, 2014), which could include mass murder.

While this is not an exhaustive review of all studies that have examined the full range of biological predictors of aggression, it provides evidence that biology does play a role in understanding an individual's risk for becoming violent. Further, certain factors (e.g., high resting heart rate) may attenuate the risk for acting violently toward others, while other factors (i.e., low resting heart rate) may heighten the risk. Moreover, as further reviewed below, social context cannot be understood in the absence of biological context and vice versa.

Biosocial Model

Biology influences but does not determine aggression. This is an important distinction for scientists, policy makers, and laypersons to remember. It is imperative that researchers examine multiple factors that contribute to violence and aggression, and, more importantly, the interaction between these different variables. Aggression is a very complex and multiply determined construct based on a variety of risk and protective factors that interact throughout development (Raine, 2002; Scarpa & Raine, 2007).

The biosocial theory is one model that attempts to explain aggression through a synergistic approach. The biosocial theory posits that to fully understand violence, one must examine the interaction between biological and social variables (Raine, Brennan, Farrington, & Mednick 1997). These variables influence the risk for violent perpetration by either increasing or decreasing the likelihood of the behavior occurring. Thus, the model allows for a level of plasticity in that the variables that predict aggression alter each other and influence the likelihood of violence. Crime can be a sequelae of biology and social factors alone, but the interaction among these variables also determines violence.

There are several studies that support this theory (see Raine, 2002; Rudolph et al., 2011 for full reviews). Raine, Brennan, Mednick, and Mednick (1996), for example, found that crime rates were higher in individuals who evidenced both biological and psychosocial risk factors than individuals with only social (i.e., poverty/unstable family environments) or biological (i.e., early life neuromotor problems) risk. Moffitt and colleagues (1997) found that those with higher blood serotonin levels who also came from a conflicted family were three times more likely to be aggressive at age 21 than men with only the serotonin or social risk factors. These findings emphasize how combinations of both social and biological risk factors can increase violence risk.

Brennan and colleagues (1997) examined the role of heart rate and skin conductance reactivity as protective factors in men. The researchers divided the participants into four groups: criminals with criminal fathers, criminals with noncriminal fathers, noncriminals with criminal fathers, and noncriminals with noncriminal fathers. Thus, having a criminal father can be viewed as a social risk factor, while having a noncriminal father was considered a social protective factor. Physiological reactivity was measured during an orienting paradigm. Results showed that noncriminals with criminal fathers had the most elevated skin conductance and heart rate reactivity compared to the other groups. Similar results have been found in other studies (e.g., Raine, Venables, & Williams, 1995), suggesting that increased arousal protects individuals from engaging in crime, even when they are faced with social risk.

Vagal tone, a parasympathetic index of cardiac activity, has been found to interact with sociological factors to predict aggressive behavior. In one study, low vagal tone in the context of parent's drinking problems (i.e., a social risk) increased externalizing problems over time (El-Sheikh, 2005). Higher respiratory sinus arrhythmia (RSA), another measure of vagal tone, protected boys who experienced maltreatment (i.e., a social risk) from engaging in aggressive behaviors (Gordis, Feres, Olezeski, Rabkin, & Trickett, 2010). Further, in girls, an interaction was found between RSA and skin conductance. Low RSA worsened the link between child maltreatment and aggression, but only when skin conductance reactivity was also low. When RSA was low, but skin conductance was high, this link was no longer significant.

Other cardiac studies find interesting results related to the environment. In one study, resting heart rate was assessed in 11-year-old males and females (Wadsworth, 1976). As expected based on the underarousal theory (Eysenck, 1997), low resting heart rate predicted criminal convictions later in life for males. Interestingly, when differences based on home stressors (i.e., intact families versus divorced/separated families) were examined, the connection between low resting heart rate and convictions only held in those with intact homes. In another similar study, murderers were found to have prefrontal glucose metabolism deficits (Raine, Buchsbaum, & LaCasse, 1997). Using the same sample and dividing them based on psychosocial deprivation

(i.e., low deprived homes vs. high deprived homes), results showed that murderers who came from “good” homes showed reduced prefrontal functioning, compared to those who had deprived backgrounds (Raine, Stoddard, Bihle, & Buchsbaum, 1998). Although Raine and Venables (1984) found that low resting heart rate was found in individuals with antisocial behavior, the connection between low resting heart rate and antisocial behavior only occurred in those from higher socioeconomic backgrounds. Similar results have been found in multiple different countries and through various biological indices (see Raine, 2013 for review).

The question therefore arises: What explains violent behavior when the individual’s environment is relatively stable, healthy, and safe? We would think these individuals are less likely to engage in violent behavior. An interpretation of these findings is the “social push theory” (Raine & Venables, 1984). According to this theory, biological risk factors for violence (e.g., cardiac underarousal) are more influential in situations of low social risk (e.g., high socioeconomic status, intact homes) when compared to high social risk (e.g., low socioeconomic status, broken homes). That is, social criminogenic factors may “push” people towards antisocial behavior. We might expect a person from a lower socioeconomic status, less stable home or violent neighborhood, for example, to engage in antisocial behaviors or to be more aggressive; sometimes they need to in order to survive. But in the absence of that social push, when a person from an affluent area or stable home engages in violent or antisocial behaviors, biological factors likely play a more important role. Bear in mind that it is not to say that biological and social factors are not at work in all these situations, but instead that the differential influence of each type of influence needs to be considered.

While the biosocial theory is promising in helping elucidate factors that contribute to aggression, it is not without its methodological and ethical issues, and a number of critiques have been noted (Raine, 2013; Walters & White, 1989). Some have argued, for example, that biosocial researchers overemphasize biological factors at the detriment of important social variables. Further, the samples (e.g., murderers) examined may not generalize to the general population. Others have suggested that biosocial theories may be racist and classist because of the focus on biological variables and how these might be attributed to certain races and classes (Gabbidon, 2007). Moreover, there is the fear that a focus on biological factors may lead to an increase in stigma or, on the other side of the argument, that criminals may be exonerated due to their physical attributes.

Nevertheless, there is a lot of promise in the biosocial model and it could help explain the development of aggressive tendencies. The biosocial theory stresses the importance of multiple influences on behavior and is supported by a substantial literature base that has examined developmental psychopathology.

Aggression Functional Subtypes: Proactive and Reactive

As with many legal terms related to homicide (e.g., first-degree murder vs. voluntary manslaughter), aggression is usually viewed as having two distinct functions based on the motivation behind the act (Raine et al., 2006). Reactive, also known as impulsive or emotional aggression, is characterized by responding to provocation, frustration or threat with aggression and is considered a loss of control in the moment (Meloy, 1997; Moyer, 1976; Raine, Meloy, et al., 1998). It is often described as hot-tempered, as it has its roots in the frustration-aggression model.

Proactive, otherwise known as premeditated or instrumental aggression, is usually nonemotional, controlled, and purposeful in nature. This type of aggression is meant to intimidate and is usually goal-oriented. It is often described as cold-tempered. It has its roots in the social learning theory (Bandura, 1973) under the pretense that aggression is operantly and vicariously learned. Further, proactive aggression is related to the assumption that violent behavior will result in positive outcomes (Crick & Dodge, 1996). The person may have learned that violence leads to good things for them.

These two functional subtypes are important to distinguish for a variety of reasons. First, the theoretical rationales for these types of aggression differ, as well as the motivations behind why aggression occurs. Second, the developmental backgrounds related to reactive and proactive aggression are thought to differ. Reactive aggression is related to unpredictable environments, harsh parenting styles, and abuse (Dodge, Lochman, Harnish, Bates, & Pettit, 1997). Proactive aggression, on the contrary, is more often seen in children with stable home environments and supportive parents (Poulin & Dishion, 2000).

Third, each functional type of aggression is differentially associated with various externalizing and internalizing problems. Proactive aggression is more likely to be related to externalizing problems, such as delinquency, while reactive aggression tends to be associated with internalizing difficulties like depression and anxiety (Brendgen, Vitaro, Tremblay, & Lavoie, 2001; Card & Little, 2006; Fite, Raine, Stouthamer-Loeber, Loeber, & Pardini, 2010; Scarpa, Haden, & Tanaka, 2010). For example, Vitaro, Gendreau, Tremblay, and Oligny (1998) examined both functional types of aggression in 12-year-old boys from low socioeconomic backgrounds. They found that proactive aggression predicted greater conduct problems and oppositional behaviors at age 15. Further, reactive aggression actually lessened the relationship between proactive aggression and delinquent behaviors. Other studies have found similar findings (e.g., Fite et al., 2010), suggesting that proactive aggression is related to more disruptive behavior problems.

Finally, the biological profiles of the functional types of aggression may be different. Proactive aggression tends to be related to baseline biological arousal levels, while reactive aggression is more closely tied to biological reactivity

(Hubbard et al., 2002; Scarpa et al., 2010; Scarpa, Tanaka, & Haden, 2008). Specifically, those high in proactive aggressive behaviors tend to have low baseline arousal and very little physiological changes during provocation. Those with higher reactive aggressive behaviors usually have increased physiological arousal at baseline and more extreme changes during provocation.

Evidence for these biological differences in proactive and reactive aggressive has been found through a number of studies. In one, higher cortisol reactivity was linked to reactive, but not proactive, aggression (Lopez-Duran, Olson, Hajal, Felt, & Vazquez, 2009). Cortisol is known as a stress hormone, and greater reactivity reflects heightened arousal. In one of the only brain studies to look at the distinctions between functional aggression subtypes, murderers were classified as reactive or proactive killers based upon the murder for which they were charged (Raine, Meloy, et al., 1998). The reactive murderers (e.g., crimes of passion) tended to have lower left and right prefrontal functioning and greater right hemisphere subcortical limbic activity compared to noncriminal controls. The proactive murderers (e.g., serial killers), conversely, had prefrontal activation that was extremely similar to controls. Yet, the proactive murderers also had heightened right subcortical limbic activity, just like the reactive murderers. This subcortical limbic region is believed to shape emotions and aggression. The researchers suggested that both functional types of murderers were predisposed to aggression through greater activation in the subcortical limbic areas; proactive murderers, however, had the prefrontal regulatory capacity to engage in aggression in more controlled ways. More research is needed to fully understand differences between these functional types of aggression.

Biosocial Perspective and Proactive Aggression

Despite evidence suggesting that there are two main functional types of aggression, and substantial support for the biosocial model of violence perpetration, there is a dearth of studies that have examined these empirical areas conjointly. This prevents important questions from being answered when researchers fail to examine functional subtypes or fail to consider the interaction of biological and social influences. Below, we highlight some of the studies that have examined proactive aggression using a biosocial framework.

Only a few studies have examined genetic and social influences related to proactive aggression. This is in spite of a critique on the lack of research in this area (DiLalla, 2002). In one study, genetic effects accounted for 41% of the variance of proactive aggression in 6-year-olds twins (Brendgen, Vitaro, Boivin, Dionne, & Perusse, 2006), while environmental effects accounted for the remaining variance. In another study, proactive and reactive aggression were examined in a sample of twins and triplets between the ages of 9 and 10

(Baker, Raine, Liu, & Jacobson, 2008). In boys, proactive aggression had a heritability estimate of 50% while reactive aggression had a heritability estimate of 38%. The researchers proposed that reactive aggression may be largely due to environmental influences, while proactive aggression may be related more to genetic influences.

The underarousal theory can inform our study of proactive aggression based on the biosocial perspective. Scarpa and colleagues (2008) examined how community violence (i.e., a social risk) might interact with the biological variable of heart rate to predict different kinds of aggression. Community violence victimization was positively related to proactive aggression, but only when children had low resting heart rates. Community violence exposure was related to less proactive aggression when children had high resting heart rates. Most importantly, no main effects were found between community violence exposure and resting cardiac measures, suggesting that the interaction between biological and social factors was related to aggression, not either of these factors alone.

In another study, Murray-Close and Rellini (2012) examined women with and without a history of sexual abuse (i.e., a social risk). Proactive and reactive relational aggression were measured along with heart rate reactivity during a social stress task. Analyses demonstrated that blunted heart rate reactivity was related to proactive relational aggression in women with a history of sexual abuse, but not in women without a history of abuse. Women with a history of abuse and high heart rate activity were less likely to engage in proactive aggression, suggesting heart rate may serve to protect those with a social risk.

Wilson and Scarpa (2014) examined the role of resting heart rate and sensation seeking in predicting proactive aggression. Sensation seeking is a social risk factor that is related to engaging in stimulating activities in order to increase arousal. Direct effects showed that in college students, sensation seeking was positively associated with proactive aggression, while resting heart rate was not significant. However, once the interaction between heart rate and sensation seeking was entered, only the interaction was significant. Low resting heart rate was associated with greater proactive aggression, but only in those with low sensation seeking. Thus, this study supported the social push theory.

Some studies show how biological, social, and aggressive variables shift across time. In a longitudinal study of twins, Tuvblad, Raine, Zheng, and Baker (2009) examined twin pairs at ages 9 and 10. Twins were followed up again a few years later. Reactive and proactive aggression were measured at each time point. At ages 9–10, shared environment explained approximately 25% of the variance for both forms of aggression, while heritability explained 26% of the variance in reactive aggression and 32% of the variance in proactive aggression. At ages 11–14, heritability explained approximately 50% of the variance for both forms of aggression (Baker et al., 2008), while shared environment explained 15% of the variance in reactive aggression and 8% of the

variance in proactive aggression. This suggests that the social and environmental influences reduced over time, while biological components were more persistent. Interestingly, reactive aggression decreased across time, but there were no significant changes in proactive aggression.

Other studies, however, do not support the biosocial theory and its relation to proactive aggression. Crozier and colleagues (2008) examined interactions between social processing, cardiac activity, and different forms of aggression in teenagers. They found no differences in resting heart rate based on the functional types of aggression. Portnoy and Farrington (2015) completed a meta-analysis examining resting heart rate and aggression. They found that the functional type of aggression did not moderate the resting heart rate and anti-social behavior relationship. They noted that very few studies examined the two functional types of aggression separately. Further, they did not examine a biosocial model.

Proactive and reactive aggression seem to be related to different physiological factors. For example, proactive aggression seems to be more related to genetic influences (Baker et al., 2008; Brendgen et al., 2006) and some studies find evidence of heart rate differences between the functional types (Murray-Close & Rellini, 2012; Scarpa et al., 2008). While there are mixed findings related to cardiac activity (Crozier et al., 2008; Portnoy & Farrington, 2015), these results may be due to methodological differences. More work is needed to understand the ways biology and social variables interact to predict proactive aggression.

Mass Shooters and Proactive Aggression: A Biosocial Framework

Can the biosocial theory be applied in explaining mass shootings? It is difficult to discuss explanations for the violence seen during mass shootings because little is known about mass shooters (Bjelopera, Bagalman, Caldwell, Finklea, & McCallion, 2013) and no known studies have examined a biosocial model in this population. We know that mass shooters are almost always male, and this may relate to gender differences observed in the functional subtypes of aggression (Baker et al., 2008; Tuvblad et al., 2009). However, beyond gender, little is known. Part of the difficulty arises because the perpetrators often commit suicide or are killed by police (Declercq & Audenaert, 2011; Mullen, 2004). Nevertheless, it is important to demonstrate how this model may be applied to mass shooters because it may inform future prevention and intervention work. Further, biological and social variables have already been utilized in court cases following crimes, and as discussed previously in this chapter, we know this theory is fairly informative in predicting certain kinds of violence (Feigenson, 2006).

The distinction between proactive and reactive aggression is relevant when discussing mass shootings, as the perpetrators generally engage in proactive aggression and lack emotion (Langman, 2009a; Meloy, 1997). Nonetheless, emotional turmoil usually does occur in the perpetrator; in fact, mass shooters typically experience frustration and feel provoked in some form, whether real or imagined, before the shootings happened (Declercq & Audenaert, 2011; Karpf & Karpf, 1994; Meloy, 1997). For example, one of the perpetrators in the Columbine shootings on April 20, 1999 (Cullen, 2009; Langman, 2009b), the perpetrator of the Luby's shooting on October 16, 1991 (Karpf & Karpf, 1994), and the perpetrator of the Virginia Tech shootings on April 16, 2007 (Langman, 2009b) were all described as having extreme emotional disturbances leading up to the shooting.

The mass shooting events themselves, however, are usually carefully thought out and deliberate in nature (Langman, 2009a). That is, there is usually a great amount of forethought, planning, and practice. The Columbine perpetrators planned their attacks for months and had even developed several stages for their murders (Cullen, 2009). During the Luby's shooting, the perpetrator displayed extreme emotions (e.g., shouting) when he first began his killing spree, but then became methodological and precise in his mannerisms (e.g., shooting people in the head, allowing others to live; Karpf & Karpf, 1994). These incidents were purposeful and controlled and the perpetrators often lacked emotion as the acts were committed.

This same pattern of unemotionality and deliberate forethought can be seen in several case studies of mass shooters. Meloy (1997), for example, noted a case where the perpetrator killed three people, including his estranged wife, and wounded several others on April 30, 1995. The perpetrator had previously purchased a rifle and seemed polite to others before the shooting occurred. During the actual shooting, eyewitnesses stated that the perpetrator "walked with a look of confidence like he has accomplished what he had come to do" and seemed to "not look scared or startled" (p. 327), suggesting low arousal levels and controlled emotions in the moment. Further, the perpetrator was seen surveying the parking lot prior to the incident by parking his vehicle at the highest point, and later returned to this same location during the actual shooting in order to have a clearer view of his targets. The perpetrator purchased several guns of various calibers, using the lower caliber on unarmed victims and using the high-powered assault weapons on police officers. Further, the perpetrator had taken the time to shave his head and put on a specific outfit. These descriptions very much portray someone engaged in premeditated acts of violence.

In another case study which utilized official court records and a clinical assessment, the perpetrator shot five individuals in their home (Declercq & Audenaert, 2011). While the perpetrator was frustrated and isolated at some points, the shootings were very carefully planned and executed. For example,

the perpetrator had a passive accomplice, practiced shooting, and tried to develop a way to catch empty shells. Further, the shooting was made to look like a robbery, rather than a targeted shooting.

Based on the profiles noted above, it seems that mass shootings are typically characterized by proactive aggression. However, interactions of biological and social risk factors have not been studied in these profiles. In the case study by Meloy (1997), some social variables were clearly noted. For example, the perpetrator and his wife had separated, his wife was engaged in an affair, a restraining order was placed against the perpetrator, and the perpetrator no longer had custody of his son. All these factors suggest the man was coming from an unstable and broken home, which have been previously noted to exacerbate criminality in empirical studies by Raine and colleagues (1996). While biological factors could not be measured, Meloy (1997) compiled evidence from several witnesses that indicated the perpetrator seemed to have low levels of arousal and very controlled emotions while killing.

Social factors, such as employment or interpersonal loss, often precede mass shootings (Mullen, 2004); yet social risks do not always precede the event. For example, one of the perpetrators of the Columbine shootings was thought to come from an authoritarian home, while the other came from a more supportive home (Cullen, 2009). Still, there may have been additional internal social risk factors, such as depression or psychopathic tendencies. Again, these alone are not enough to predict who will become mass shooters.

Based upon the aforementioned research on biological risks for aggression and violence, it is important to consider that biology also may play a role in mass shooting incidents. The perpetrator in the University of Texas at Austin shootings on August 1, 1966 was found to have a “glioblastoma multiforme” (Governor’s Committee, 1966, p. 7) on the right temporo-occipital lobe, which may have contributed to his behavior. Further, it was reported that he also experienced a great deal of personal stress, including having his parents separate, prior to the shootings. Could the combined influences of these risk factors have compelled this individual to commit mass murder? We will never know, but it does raise a number of possibilities that should be considered.

As mentioned, no known studies have examined a biosocial framework to predict mass shootings. However, there are many reports detailing psychosocial factors after mass shooting incidents. We suggest here that biological factors and the interactions between variables also should be considered in these profiles. Not only could this help us in understanding why the mass shooting occurred, but it could also help predict future risks for mass shooting. Mass shooters may have a very different profile compared to other criminals, including other types of murderers. For example, we know that certain personality types are related to different biological profiles and susceptibility to aggression (Lorber, 2004).

Based upon the biosocial theory, we urge that researchers incorporate as many social and biological variables as possible in their studies of violence and mass shootings. Gordis and colleagues (2010), for example, found that the interaction between maltreatment history and physiology in predicting aggression risk differed between boys and girls. The biosocial framework can help us understand how and why people aggress by examining interactions between variables. The implication is that important information on mass shootings can be gained if researchers expand their current research and incorporate a biosocial framework that also includes various functions of aggression, particularly proactive aggression.

Implications

In sum, there is now a large body of evidence supporting a biosocial framework for violence, including the social push theory that might explain why individuals from a less vulnerable social environment may engage in violence. Further, some researchers have incorporated a biosocial framework to examine proactive aggression, which is believed to be applicable to mass shooting incidents. In light of these findings, we offer some suggestions to help policy makers, researchers, and the public make informed decisions regarding the understanding of mass shooting.

Developmental prevention is one area that has particular promise based on biosocial theories (Rocque, Welsh, & Raine, 2012). This form of prevention involves interventions that target risk and protective factors in order to mitigate aggression, including proactive aggression. This could include both social and biological factors. Biosocial approaches have been touted as being one of the most effective approaches to violence prevention (Raine, 2002), with some arguing that “prevention approaches can potentially suppress genetic expression of risk factors by, for example, favorable family environment” (Fishbein, 2000, p. 101). It would be amazing to think that we may be able to intervene well before an incident occurs.

Given that individuals who are underaroused may be more likely to engage in proactive aggression due to discomfort, safe stimulating activities could be offered to the individual to help mitigate their increased risk for aggression. Individuals could also be taught to select safer, yet arousing activities. This might take the form of afterschool programming or athletics. These programs may be doubly (should we even say multiplicatively) beneficial. Such afterschool programming may also provide a buffer against the social risk while at the same time providing the biological changes needed in those at risk for underarousal. For example, afterschool programs could provide “economically disadvantaged children with cognitively stimulating and enriching experiences that their parents are unlikely to provide at home” (Duncan & Magnuson, 2004, p. 105).

While Duncan and Magnuson (2004) focused specifically on engagement that was cognitively arousing, the same rationale could be applied to biologically arousing activities.

Parenting programs also offer some promise in preventing criminal activity, which could include mass shootings. For example, the Nurse-Family Partnership program involved different groups, with one group of parents receiving nurse visits during pregnancy only, one group receiving nurse visits during pregnancy and the first 2 years of life, and one group with no nurse visits at all (Olds, Henderson, Chamberlin, & Tatelbaum, 1986; Olds et al., 1998). Caregivers who received postnatal nurse visits had significantly lower reports of engaging in child abuse. This was especially true for mothers who were poorer, unmarried, or teenagers. The nurses informed the mothers about pre- and postnatal care, development, and nutrition (i.e., a biological variable). When children were followed up as teenagers, those who had mothers in the treatment condition had committed fewer violent and criminal offenses. Considering what we know about the biosocial model, including the bidirectional influences of social factors on biology, this particular program likely influenced all factors from the model to temper hostility.

Another highly encouraging experimental study involved comparing 3-year-old children in a 2-year enrichment nursery school intervention to 3-year-olds in a control group (Raine et al., 2001). The enrichment program involved cognitive enhancement, nutrition and hygiene management, field trips, medical aid, social-emotional development, home visits, remedial components, parental involvement, and transitional help. Skin conductance and electroencephalogram (EEG) reactivity were measured in response to various stimuli, such as an orienting tone, speech and a neuropsychological test, at age 3 and then again at age 11. Those in the enrichment program showed, when compared to the control group, increased skin conductance amplitudes, quicker skin conductance rise and recovery times, as well as slow-wave EEG at rest and during a neuropsychological test that assessed selective and sustained attention. This study demonstrated that early enrichment impacted long-term biological processes related to arousal and information processing.

Additionally, these programs do not have to be time-consuming to be effective. Conrod, Castellanos-Ryan, and Strang (2010) examined the effectiveness of a coping skills program in teenagers with higher levels of impulsive or sensation-seeking behaviors. Those in the intervention group had two 90-minute sessions where problem-solving and cognitive behavioral therapy techniques were taught. Those who received the intervention were less likely to try drugs and used fewer drugs 2 years later.

The knowledge we have about differences based on functional aggression subtypes may also prove helpful. In younger individuals, both functional subtypes of aggression seem to be more related to social and environmental influences (Tuvblad et al., 2009). At this age, prevention could focus more on

social variables with a particular emphasis on reactive aggression. As people age, parental styles may need to change and parents need to be aware that proactive aggression increases with age. More permissive parenting is linked to more proactive aggression, as parents are not modeling appropriate behavior or demonstrating consistent consequences in response to inappropriate behavior (Brendgen et al., 2001). By being more mindful of this change in functional aggression types, others could help model appropriate behavior as a way to mitigate violence risk. Additionally, prior research has demonstrated changes in reactive and proactive aggression across time. Early identification of those who are more reactive may help prevent these individuals from becoming proactively aggressive later.

Of course, as there are those that disagree with the biosocial model, there are also those who disagree with biological treatments. Raine (2013) highlights some of these controversies. Some fear that biology may be exploited and that people identified as being at risk for violent perpetration may be unfairly treated or even stigmatized. For example, a child may come from an affluent family and have low resting heart rate. Should we do something in order to prevent the possibility of proactive aggression? If we identify somebody that already has high rates of proactive aggression, should work be done to examine biological indices? Clearly, there are a lot of individuals who may have risk factors, but most will not engage in extreme violence, such as a mass shooting.

Although we currently do not, and likely will never, have a full understanding of the biological or social influences that contribute to mass shootings, prior research and existing theories certainly can inform us. As presented in this chapter, the distinction between nature and nurture is artificial. Biology does not exist without social factors influencing it; and social factors do not exist without biology influencing them. An understanding of the individual and behavior cannot be limited to expectations based on one factor or another. More work is needed to examine multiple biological and social factors to help understand mass violence.

Conclusions

Biosocial perspectives of mass shooting perpetration offer potentially useful findings in regard to the identification of those at risk of mass murder. In particular, we need to consider the interaction effects. Biologically based researchers could do a better job of examining the social factors at play; concurrently, social scientists would be remiss for ignoring the role of possible biological determinants. Moreover, aggression researchers are urged to recognize and take into account the functional subtypes of aggression and their biosocial origins.

Will these theories be able to detect every person at risk of committing a mass shooting? Of course not. However, biosocial models may help to identify those most at risk, whether through social, biological, or some interaction of these variables. This identification of multiple risks could lead to a better understanding of what prompts proactive aggression, and perhaps could lead to better mechanisms of pinpointing those most in danger of engaging in mass shootings. Intervention programs could then be implemented that specifically address the needs of these individuals and may help to mitigate the social and biological risk factors. By combining efforts across the various empirical foci, we will ideally have a better understanding of why individuals become mass shooting perpetrators and may be able to better intervene.

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The Challenge of Predicting Dangerousness

Sara Chiara Haden

Controlling violence is a public health issue. Arguably each violent act impacts a lot of people – the perpetrator, survivor(s), family members, witnesses, and those who hear about it. Risk assessment, or predicting the likelihood that someone will become violent, is one of the most controversial topics within the intersection of behavioral science and the law. Most mental health professionals in both inpatient and outpatient settings regularly perform acute risk assessments of their patients during intakes, diagnostic evaluations, treatment planning, and discharge. The implications of these predictions are significant and can impact risk aversion policies, sanctions for “dangerous” persons, as well as consequences for mental health professionals who make false negative errors. To predict an individual’s dangerousness is a powerful ability. But, is it even possible to correctly identify these individuals?

Despite the significant implications of violence risk assessment for those individuals assessed, the predictor (i.e., clinician), and society at large, there are several barriers to its utility. Also, the literature on predicting dangerousness is vast, contradictory, and empirically limited. One can find nearly every form of literature from clinical anecdotes to program evaluation studies describing how violence risk assessments should be performed. Some researchers focus on empirically determined correlates of violence, while others stress less rigorous psychodynamic formulations. This presents a challenge for clinicians identifying the most relevant factors in a violence risk assessment. Unfortunately, there is no consensus about how to best assess dangerousness.

In this chapter, three primary challenges of violence risk assessment are highlighted. First, I review the definitions of violence and its relationship to dangerousness. Second, I review the evolution of violence risk assessment – describing the characteristics of violence risk assessment and the accuracy of these assessments. Third, I review the vast number of correlates we use to predict dangerousness. Every incident of a mass shooting is distinct and predicting the likelihood that someone will be dangerous is difficult. Yet, we may be able to

apply existing theories and previous empirical work to improve our understanding of who commits such horrific acts of violence.

Challenge #1: The Question of Dangerousness

One of the primary challenges related to predicting dangerousness is the question clinicians are asked to answer. The question is not and should not be “Is this person dangerous?” This is decided by a yes or no response. Rather, relative risk is assessed quite narrowly and the question might be rephrased “What is the relative likelihood that this person may commit a specific violent act within a specific time frame?” The answer to this question is not as simple – and considers the nature of the risk (i.e., high, medium, or low), a specified time frame, and the context (e.g., inpatient hospitalization, incarceration). Risk assessment also determines an individual’s risk of harm to self or others. Violence prediction varies by context and it is important to appreciate that not all methods of risk assessment will address every question. For example, threat assessment in the workplace may ask an entirely different kind of question (Stock, 2007).

Early on, Shah (1975), the director of the Center for Studies of Crime and Delinquency at the National Institute of Mental Health, argued that the law should not ask mental health professionals to predict dangerousness because the dangerousness criteria contradicted a clinician’s commitment to the welfare of people with mental illness. When a clinician is asked to predict violence, it also needs to be recognized that there are political consequences that might influence answering the question posed. In fact, clinicians are more inclined to classify someone as dangerous as there is no liability if a client predicted to be dangerous is later confined or released (Melton, Petrila, Poythress, & Slobogin, 1997). When the assessment of dangerousness became more widespread, Shah later went on to call for improvements in its prediction, emphasizing that a clinician’s ability to predict future violence depended on a myriad of factors.

Despite the question that is asked when the issue of dangerousness is assessed, the process used can certainly lead to a yes/no response. In 2003, Virginia began requiring a named structure violent assessment tool with a cutoff score specified by law for Sexually Violent Predator (SVP) cases. This means that if someone is above the cutoff score, then the person is deemed violent. Popular tools include the Rapid Risk Assessment of Sexual Offender Recidivism (RRASOR; Hanson, 1997) and STATIC-99 (Hanson & Thornton, 2000). Both tests are actuarial, focus on static variables (discussed at length in the following section), and provide a yes/no response to the question of dangerousness. Certainly, these assessment results are easy for the courts to understand and subsequently impose.

Dangerousness is a legal concept. Clinicians cannot measure it directly, but may be able to tap an outcome of it, such as the propensity for future violent

behavior. Comments on dangerousness are offered and, in turn, affect our understanding of the term – “dangerousness to others,” “dangerousness to self,” “criminal act,” “homicidal or suicidal,” and so forth. Oftentimes, “danger” refers to physical harm to other persons. The American Psychiatric Association (1983) defines a dangerous person as “a person [who] is likely in the near future to cause physical injury or physical abuse to another person or substantial damage to another person’s property” (p. 673). There is also no universally accepted definition of “violence.” Does it always involve physical contact? Understandably, the lack of clear and consistent guidelines on what constitutes risk influences the clinician’s task. In fact, there are no guidelines to turn to for definitions of dangerousness in case law (Monahan & Shah, 1989).

Challenge #2: The Evolution of Violence Prediction

It is important to appreciate that the process of assessing dangerousness is inherently different from other predictive tasks clinicians may be asked to do (Litwack, 2001). Individuals deemed to be at greater risk are often treated differently than those not. In fact, many of those individuals whose risk is assessed will never be released into the community (Melton et al., 1997), arguably limiting the ability to even evaluate the validity of those assessments.

Historically, risk assessments distinguished “actuarial” from “clinical” methods. Meehl (1954) initially characterized actuarial methods as systemized and resulting in a probability statement. These forms of assessments tend to use strict decision rules and cutoff scores – like the RRASOR and STATIC-99 described earlier. Clinical methods create hypotheses about future behavior and are less focused on a fixed defined probability statement. Typically this dichotomy has also been viewed as either involving a “structured” or “unstructured” process, underscoring the difference in the very nature of these methods. Moreover, these methods tend to rely on different types of risk factors – either “static” (i.e., variables that cannot change) or “dynamic” variables (i.e., those that can change). However, Monahan (2003) argued that this dichotomy is not useful because many actuarial methods do not ignore clinical judgment and even require clinical skill to administer. Rather, risk assessment may be viewed on a *continuum* from completely unstructured (e.g., purely clinical risk assessment) to completely structured (e.g., purely actuarial method). Both ends of the continuum and where they meet are reviewed, along with evidence of their disputed effectiveness.

The pure “clinical” end of the risk assessment continuum

Primarily clinical methods of risk assessment include either unstructured or structured clinical opinion. For both types, clinicians are presumably educated on and have experience in predicting violence. The risk factors of focus in such

a method stem from one's prior clinical experience and theoretical orientation. They are combined to generate a professional, albeit subjective, judgment of an individual's likelihood of dangerousness. The hallmarks of the clinical method are that it relies on the clinician's expertise and measures the probability of risk for a specific individual. It is not driven by empirical work and there are no rules about what aspects of the individual are collected. While the structured clinical opinion approach is considered to be more uniform than unstructured clinical opinion, and predictions are deemed more accurate when one is more confident (Douglas & Ogloff, 2003), these primarily clinical forms of risk assessment lack validity, reliability, and accountability (Stock, 2007).

Unfortunately the unimpressive ability of clinicians to accurately predict dangerousness has been well-documented (e.g., Monahan, 1984; Otto, 1992), with error rates ranging from 44% to 85%. While we prefer not to admit that clinicians are vulnerable to the same cognitive pitfalls as our patients, dangerousness estimates are affected by our inherent cognitive biases (Krauss & Sales, 2001). The fundamental attribution error biases risk assessments when clinicians incorrectly perceive a patient's behavior as being due to traits rather than states – potentially even more so when clinicians have actually received more training in these assessments. This means that when a clinician is assessing a criminal's dangerousness, the very nature of the context (e.g., violent criminal in prison) affects the clinician's assessment of the person's capacity for future dangerous behavior. Certainly clinicians know that people who engage in a behavior are not always going to engage in it again and they can appreciate that many behaviors will only be expressed under certain conditions. Even mass murderers will not kill under any circumstance. Unfortunately, our own stereotypes of a dangerous individual can lead to inaccurate risk assessment decisions.

Clinical risk assessment also fails to consider base rates of violence when estimating an individual's risk of violence. Persistent acts of violence are actually committed by a small proportion of the offender population – 50% of crimes are committed by 5–6% of offenders (Farrington, Ohlin, & Wilson, 1986). Predicting a very low-frequency event (e.g., mass murder) is quite difficult and errors will be made (Yang, Wong, & Coid, 2010). As many scholars in the field point out (e.g., Monahan, 1984), the error rate of false positives will be high since many people are going to wrongly be deemed violent when a low frequency event is being predicted. Moreover, in the case of risk assessment of offenders who have committed violent crimes in the past, the saliency and recency effect of that previous violent act leads clinicians to readily select evidence that supports the likelihood that the individual will offend again and to more easily ignore evidence that disconfirms it (Melton et al., 1997). In light of these cognitive practices, practitioners are likely to overpredict violence when performing clinical assessments of risk (Monahan et al., 2001).

Therefore, for the above reasons, evidence consistently fails to support the effectiveness of purely clinical methods of violent risk assessment. However,

one of the primary issues with this form of risk assessment may be our confusion regarding what “clinical judgment” actually constitutes. Westen and Weinberger (2004) argue that “clinical judgment” in violence risk assessment does not stop at clinicians’ observations and inferences, but these observations and inferences can then be aggregated using a structured measure discussed in a later section. The opposite end of the risk assessment continuum is a purely nonclinical method.

The pure “actuarial” end of the risk assessment continuum

Actuarial methods of risk assessment were inspired by methods used by insurance agencies (Roffey & Kaliski, 2012). Such assessment tools are said to require no clinical expertise and the information that they rely on could be gleaned from a chart review of one’s history. For example, the RRASOR (Hanson, 1997) is considered an empirically derived actuarial tool to assess adult male sex offenders’ increased risk based on only four items – (1) offender’s age less than 25 years, (2) presence of prior offenses, (3) victim(s) unrelated to the offender, and (4) presence of male victim(s). In fact, this particular measure has consistently discriminated between recidivists and nonrecidivists with effect sizes as high as 1.11 (i.e., using a sample of sex offenders with mental retardation as measured with criteria from the Diagnostic and Statistical Manual for Mental Disorder-IV (American Psychiatric Association, 2000; Harris & Tough, 2004). Risk factors in pure actuarial assessment are preselected, weighted, statistically determined, and the individual assessed is compared to a norm-based reference group. A number is provided that represents the number of characteristics the patient satisfies, which determines which group the individual is most representative of – either the dangerous or non-dangerous group (Harris, Rice, & Quinsey, 1993). The process is transparent, discrete, and precise. However, the nuances that characterize the score are ignored and certainly do not address risk management issues. The heterogeneity within each group is not elaborated on for simplicity’s sake. Therefore individuals in the “dangerous” group may be quite different from one another but the score does not tell us how these individuals are different.

In terms of their accuracy, empirical studies have overwhelmingly supported the actuarial/structured/static method over the clinical/unstructured/dynamic methods (e.g., Grove, Zald, Lebow, Snitz, & Nelson, 2000; Meehl, 1954). In fact, in their 1998 American Psychological Association publication, Quinsey, Harris, Rice, and Cormier (1998) argued for the full replacement of the clinical method with the actuarial method. In their book elaborating on the Violence Risk Appraisal Guide (VRAG; Harris et al., 1993) measure, they stated that actuarial measures are “too good and clinical judgment too poor to risk contaminating the former with the latter” (Quinsey et al., 1998, p. 171). They cautioned clinicians that, while ultimately it may make sense to adjust decisions

based on actuarial methods, clinicians have taken advantage of the adjustments and overused clinical opinions when assessing dangerousness.

In fact, the support for pure actuarial methods is often noted to be impressive (see Gottfredson, 1987; Loza & Dhaliwal, 1997). In a meta-analysis of 118 prediction studies of risk assessment for sex offenders, actuarial measures (predicting sexual or violent recidivism) were superior to all other methods (Hanson & Morton-Bourgon, 2009). In the prediction of sexual recidivism, the median effect size of actuarial measures was 0.74 compared to 0.44 for unstructured professional judgments. For predicting violent recidivism the median effect size was 0.79 for actuarial methods and 0.30 for unstructured professional judgment. The accuracy of four actuarial instruments predicting violent recidivism in four samples of sex offenders was demonstrated with receiver operating characteristic (ROC) curve areas,¹ with a value of .84 for the VRAG (Harris et al., 2003), suggesting an extremely high predictive accuracy and a large effect size.

A recent “state of the art” assessment, multimodel actuarial risk assessment, uses the Iterative Classification Tree method which allows multiple diverse combinations of risk factors to characterize different groups – appreciating the different combinations of risk factors from different “models” (Banks et al., 2004). Based on the Classification Tree approach applied to data mining, group membership is predicted in classes of multiple variables. The software is still new but the prediction ability is considered to be superior as it evaluates several different models of violence simultaneously (Skeem et al., 2004). Unlike the original actuarial method, the multimodal actuarial method provides a number of discrete classifications to consider and may address the original concerns about the failure of actuarial approaches to appreciate the heterogeneity of individuals within group. It does not require any clinical judgment and involves multiple models of predicting dangerousness. Although initial findings seem encouraging, additional research on its effectiveness is necessary.

By its very definition, purely actuarial methods of violence risk assessment do not consider “clinical judgment.” This leads to one of its most significant flaws – the failure to consider case-specific information. All that matters in the actuarial method is the individual’s score on the predetermined risk factors. Thus someone is classified as dangerous even if the conditions under which the individual expresses dangerous behavior are quite unique. “Equations tend to be inflexible” (Melton et al., 1997, p. 284). Moreover, we cannot ignore the false positive error rates in these statistical approaches. Early on, Coccozza and Steadman (1974) reported a 66% false positive error rate with actuarial methods (of course this is compared to an 85% false positive error rate with purely clinical techniques). Even Melton et al. (1997) state that the research on the effectiveness of actuarial methods has not fully supported that these methods are indeed superior to clinical methods. In a review by Litwack (2001), he outlined arguments against Quinsey et al.’s (1998) position, stating numerous

reasons why actuarial assessments of dangerous can never truly substitute clinical assessment.

The middle of the continuum

Guided clinical judgment, also referred to as adjusted actuarial assessment, constitutes the middle of the risk assessment continuum and includes structured professional judgment (SPJ), anamnestic approaches, and actuarial risk assessment. Each of these methods to some extent emphasizes both empirically validated risk factors and clinical inferences and observations (Hanson, 1998).

SPJ focuses on empirically derived behavior that is related to violence, including variables in one's history and current triggers (Guy, Packer, & Warnken, 2012). Assessments can be individualized and contextualized and the evaluator can apply discretion. It is also appreciated that an individual's score can change – one's risk of engaging in dangerous behavior is dynamic. Each variable is scored and equally considered in the final scoring of the individual's dangerousness. There is no discrete grouping of dangerous or nondangerous. The most well-researched measure of this kind is the Historical, Clinical, Risk Management-20 (HCR-20) (Webster, Eaves, Douglas, & Wintrup, 1995) which includes 20 risk factors in three domains: historical (e.g., previous violence, psychopathy), clinical (e.g., negative attitudes, active symptoms of a major mental illness), and risk management (e.g., treatment noncompliance, plans lack feasibility). The HCR-20 Version 2 has been empirically validated in a number of studies assessing violence risk (e.g., Bloom, Webster, Hucker, & De Freitas, 2005). In their meta-analysis, Yang and colleagues (2010) compared nine risk assessment tools in 28 independent studies from 1999 to 2008. They found that the HCR-20 Version 2 and the Offender Group Reconviction Scale (designed for use by probation officers; Copas & Marshall, 1998) had the largest effect sizes, although they did not believe that the difference between the HCR-20 and the other instruments was clinically significant. The HCR-20 Version 3 was recently developed and, among changes to the names of the risk factors and content of some of the items, one of the primary changes was that the item ratings was revised to be nominal (N = Not Present, P = Possibly or Partially Present, or Y = Present) compared to the former numeric classification for items. In a study of the HCR-20 Version 3 in 56 offenders and 50 civil psychiatric patients, Version 3 significantly predicted violence at 4 to 6 weeks and 6 to 8 months as did Version 2, suggesting that both versions accurately predicted future violence (Strub, Douglas, & Nicholls, 2014).

The anamnestic approach to risk assessment involves a detailed examination of an individual's violence history – applying behavior analytic strategies to each act of violence (Melton et al., 1997). The interview hinges on each violent

event – questioning the preceding and subsequent thoughts, feelings, behaviors, the violent act itself, as well as any individuals involved and other relevant information. It is tailored to the individual and focuses on how the individual's past might influence the way in which they might behave in the future. If we assume that their behavior will be repeated, then relying on patterns of violence might inform under what conditions violence will be perpetrated. Heilbrun, Yasuhara, and Shah (2010) note how this approach can descriptively convey relevant risk factors that can be linked to an individual's intervention plan. Unfortunately this specific approach lacks research. Further, risk factors can be subject to change and are quite individualized in this context.

Actuarial-forensic risk assessment is an actuarial method that is adjusted based on contextual factors. While, to the author's knowledge it has hardly been a researched form of risk assessment, there is a need for this form of risk assessment. For example, Urbanik et al. (2007) compared an actuarial model of recidivism in a sample of offenders who have been sanctioned (i.e., sanction sample) to a sample of violent or sexual offenders who have been sentenced (i.e., verdict sample) in Zurich, Switzerland. They found that risk factors for violence differed between the groups and none of the actuarial assessments considered the context. While both samples were more likely to recidivate if their victims were strangers, the verdict sample was more likely to if there was a history of alcohol/drug abuse and less likely to when there was a relationship with the victim. The sanction sample was more likely to recidivate if they lived in a foster home prior to age 15 and had Swiss citizenship but less likely to recidivate if delusional symptoms were present at the time of the offense or they were married. Unfortunately, while risk factors are clinically modified and there is an appreciation of the function of the risks in the particular context, a major weakness of this method is that it provides an idiosyncratic interpretation that is perhaps not generalizable. It is unclear if the multimodel actuarial risk assessment described previously might be able to consider contexts as the actuarial-forensic method might suggest.

Challenge #3: Correlates of Dangerousness

This final section will review the factors that have been empirically tested and related to dangerous behavior. As previously discussed, there has been an important distinction established between the nature of these variables. Static variables refer to factors that cannot change; they are fixed. Often these variables are in one's past (e.g., history of violations), a characteristic of a crime that was committed (e.g., male victim), or stable characteristics of the person (e.g., biological sex). Many of the strict actuarial risk assessment methods tend to rely on static variables. Dynamic variables refer to variables that can change. Of course, some may seemingly be stable (e.g., an antisocial attitude), while

others are acute (e.g., access to gun). Also some of these dynamic variables may be assessed in a dynamic way (i.e., how missing a scheduled appointment is related to a history of violating release conditions; Conroy & Murrie, 2007). Those risk assessments that are in the middle of the continuum tend to consider both types of variables when predicting dangerousness. In fact, some researchers have eschewed the static/dynamic dichotomy and focused on dispositional, historical, and contextual factors (Melton et al., 1997) or, on the HCR-20 – historical, clinical, and risk management factors.

Empirically supported correlates of violence

Violence risk assessment must explicitly consider empirically supported risk and protective factors. Of course the nature of the assessment might limit one's access to these factors, but when one does have access to this information, failing to identify how these empirically supported variables predict dangerousness is perhaps unethical.

Table 6.1 includes a list of the replicated individual variables linked to future violence. The list is not meant to be exhaustive as there are a myriad of factors that predict violent behavior. Presently, there is no standard measure that includes all of these empirically supported correlates. The list is divided into five categories: (1) demographic, (2) clinical, (3) historical, (4) present person, and (5) present contextual.

Demographic factors While these variables, which are characteristics of the individual, may be the easiest to identify, the mechanisms explaining why they are related to violent behavior remain unclear. Some demographic factors (e.g., race, marital status, socioeconomic status) have been significantly related to violence but their empirical support is not as strong as it is for age and biological sex. Younger age has been repeatedly linked to violence propensity. There is also evidence that as individuals age they slowly disengage from violent behavior. In fact, the age-crime curve shows that the prevalence of offending increases from late childhood, peaks during 15 to 19 years of age, and then declines starting in the early twenties (Farrington, 1986). Notably, the younger the person is, the more time the person has to commit a violent act (Harris et al., 1993).

Male sex has also been consistently related to increased dangerousness. Of course most of the research on risk assessment has been conducted exclusively with male populations. Some studies that have reviewed sex differences in risk factors like antisocial personality disorder (ASPD) and psychopathy have found that both are more frequent in males than females (Cale & Lilienfeld, 2002). Certainly the population of male offenders is 14 times that of female offenders (Guerino, Harrison, & Sabol, 2011). However, there still needs to be more work on sex differences in dangerousness.

Table 6.1 Empirically supported correlates of violence.

<i>Demographic factors</i>	
Younger age	Farrington (1986); Harris et al. (1993)
Sex (men)	Cale and Lilienfeld (2002); Guerino et al. (2011)
<i>Clinical factors</i>	
Psychopathy	Douglas et al. (2006)
Past/current substance abuse	Dowden and Brown (2002); Swanson et al. (1990)
Antisocial personality disorder	Bonta et al. (1998); Robins (1993)
<i>Historical factors</i>	
Supervision violation/poor treatment compliance	Bonta et al. (1996)
Past history of violent behavior	Bonta et al. (1998)
Arrest history/juvenile delinquency	Wolfgang et al. (1972)
<i>Present person factors</i>	
Anger	Caspi et al. (1994); Knight and Prentky (1990); Novaco (1994)
Impulsiveness	Monahan et al. (2001)
Negative affect	Douglas and Skeem (2005)
Antisocial attitudes	Gendreau et al. (1997); Mills, Kroner, and Hemmati (2004)
<i>Present contextual factors</i>	
Neighborhood	Monahan et al. (2001)
Social support	Webster et al. (1995)
Weapon availability	Berkowitz and LePage (1967)
Victim availability	Felson and Steadman (1983)

Clinical factors This group of correlates includes variables that are typically assessed by clinicians. The research on the link between major psychosis and violence, while often mentioned, is still unclear and therefore not included in Table 6.1. Some studies have found that the risk of violence is indeed higher among people diagnosed with a psychiatric disorder who are experiencing active psychotic symptoms (e.g., Swanson, Holzer, Ganju, & Jono, 1990); other research has reported that such symptoms can be linked to lower levels of violence (e.g., Estroff & Zimmer, 1994). It has been argued that the link between mental illness and violence may be based on an illusory correlation (i.e., perceiving a relationship between the two even when no relationship exists; Walters, 1992).

Psychopathy refers to the construct defined by Robert Hare and colleagues on the Psychopathy Checklist – Revised (PCL-R; Hare, 2003), consisting of interpersonal/affective personality traits and socially deviant behavior. It has reliably been related to violent recidivism (see Douglas, Vincent, & Edens,

2006 for a review). Notably it is also a factor considered on many risk assessment instruments (e.g., VRAG, HCR-20, and ICT). In the manual, Hare (2003) states that the PCL-R requires considerable “clinical judgment.”

Substance abuse (past and present) is another factor positively related to dangerousness. Dowden and Brown (2002) reported that drug and alcohol abuse were consistently linked to recidivism. In fact, Swanson and colleagues (1990) reported that substance abuse also strengthened the relationship between mental disorder and criminal behavior. Substances affect inhibition and may contribute to poor self-regulation and a greater propensity to act when feeling triggered by a situation.

ASPD is also considered to predict dangerousness (Bonta, Law, & Hanson, 1998) and is part of the criteria that are embedded in the PCL-R. Some studies have found that ASPD explains the link between major psychoses and criminal behavior (Robins, 1993). By its very definition (American Psychiatric Association, 2013), someone who meets criteria for ASPD is more likely to engage in reckless behavior that harms others.

Historical factors These variables are typically the focus of strict actuarial measures – static characteristics stemming from a person’s past behaviors. Supervision violation and poor treatment compliance are related to the failure to comply with prescribed conditions and include not following treatment guidelines, escaping from custody, or violating any probationary requirements. This factor has been related to violent recidivism (Bonta, Harman, Hann, & Cormier, 1996). Many violence risk assessment tools consider this factor, including the VRAG and HCR-20.

A past history of violent behavior is considered in nearly all violence risk assessment – even unstructured interviews. It has been firmly established as one of the strongest risk factors in numerous studies (see Bonta et al., 1998) and is also included in most actuarial assessment measures. The amnesic approach to risk assessment focuses on processing each violent incident from an individual’s past. Of course, the context of past violence must be considered when it is used to predict dangerousness.

Arrest history and juvenile delinquency are inevitably related to one’s past history of violence and younger age variables as well. There is also evidence that as the number of arrests increases, rearrest is nearly inevitable (e.g., 80% chance of rearrest with four or more arrests; Wolfgang, Figlio, & Sellin, 1972).

Present person factors This group of variables taps features of the person and involves current states. For most of these variables, valid and reliable methods of measurement exist. Anger is a variable in several violence risk assessment measures and has been well supported in the empirical literature and linked to

violent behavior among offenders (e.g., Caspi et al., 1994) and psychiatric patients (Novaco, 1994). In fact, research with sex offenders demonstrated that rapists reported experiencing anger immediately prior to the commission of rape (Knight & Prentky, 1990). Interestingly, anger did not differentiate between violent and nonviolent recidivism in a sample of incarcerated male offenders (Loza & Loza-Fanous, 1999). Perhaps the method of assessing anger is inadequate when trying to reliably predict violent behavior.

Impulsivity speaks to self-regulation deficits and, depending on how it is measured, may be classified as a trait rather than a state. Certainly impulsivity involves a cognitive component – in fact the nonplanning dimension of impulsivity has been identified as a risk factor (Monahan et al., 2001). It is also considered in many of the risk assessment measures and other risk factors (e.g., ASPD, psychopathy). Traditionally, individuals who perceive an event as confrontational may respond without thinking – albeit violently – if they have difficulties inhibiting their responses. The individual lacks control over their feelings, behaviors, and thoughts. Impulsive aggression (versus premeditated aggression) is typically related to greater destruction.

Negative affect includes anger but is more generally applied to aversive mood states beyond anger, including sadness, disgust, fear, guilt, nervousness, contempt, and so forth (Watson, Clark, & Tellegen, 1988). Negative affect can be associated with greater impulsivity and substance use, as well as increased problems with one's social networks. Douglas and Skeem (2005) reported that negative affect (among other variables) is a critical dynamic variable that predicts violent behavior.

Antisocial attitudes are procriminal beliefs that support risk-taking behaviors. In their meta-analysis, Gendreau, Grant, Leipziger, and Collins (1979) found that antisocial attitude has the strongest link to criminal conduct – as well as prison misconduct (Gendreau, Goggin, & Law, 1997). Borne out of this literature, the Measure of Criminal Attitudes and Associates (MCAA; Mills, Kroner, & Forth, 2002) was developed to assess antisocial behavior and when given to incarcerated males significantly predicted violent recidivism (Mills, Kroner, & Hemmati, 2004).

Present contextual factors This group of variables involves characteristics of an individual's current environment. One's neighborhood can be a powerful predictor of violent behavior – generally studied in relation to the discharge of patients from mental health facilities. The MacArthur Study (Monahan et al., 2001) showed that individuals who resided in neighborhoods with increased poverty had the highest violence risk. Indeed, there are areas where violence is more common.

The impact of social support on violence risk depends on the nature of the support as well as the individual's perception of it. Individuals who have a social network that supports criminal attitudes and behaviors display greater

violent behavior. Many risk assessment measures consider whether or not the individual has a social network (or problems with their social network). Presumably, individuals who perceive support from others that is not procriminal will be less inclined to engage in violent behavior.

Another contextual factor that is not considered in most risk assessment measures is the availability of a weapon. When there is a weapon present, the risk of perpetrating violence is heightened. In fact, the “weapons effect” posits that just seeing a gun can lead to more aggression (Berkowitz & LePage, 1967). This has implications for one’s home and neighborhood. It is important to consider this relatively simple yet potent risk factor when performing a violence risk assessment.

Of course, it goes without saying that violence is more likely to occur when there are victims available. Individuals who do not discriminate between victims (e.g., a child molester who has both familial and nonfamilial victims) are more likely to recidivate. There are also commonalities among survivors of violent crime that cannot be ignored. Felson and Steadman (1983) found that homicide victims were overwhelmingly intoxicated, aggressive in some way towards the murderer, and threatened to use or used a weapon prior to their murder. Moreover, when someone else was present supporting the perpetrator, the violence tended to be much greater (Felson, Ribner, & Siegel, 1984).

The Challenge Continues

In Mossman’s (2000) commentary of “accurate” predictions of violence, he highlighted that if we assume 1 in 1,000 people will kill and use a test that is 95% accurate in identifying potential killers, out of the 1,000 people, 95 will be accurately classified. However, if we assessed 10,000 people, 495 would be incorrectly classified. Mossman also reminded us that accurately classifying dangerous people is not the same as correctly identifying them. He argued that when dealing with a low base rate event, the method used for prediction needs to be nearly foolproof to be useful. Today, there is no such method.

Out of the many challenges that remain in the field of predicting dangerousness, one more needs to be mentioned. Oftentimes, clinicians who are making predictions about violence have not been trained on risk assessment and rely on cognitive biases when they attempt to predict dangerousness (Krauss & Sales, 2001). Unfortunately, there is no standard of training in dangerousness assessment (Borum, 1996). However, as Krauss and Sales (2001) point out – predictive accuracy may not be improved if appropriate training was available. Despite this, clinicians who perform violence risk assessment must be informed of its empirical literature, as well as its relationship to testimony about dangerousness. While risk communication and risk management are beyond the scope of this review, comprehensive training in risk assessment methods is necessary.

While clinicians continuously assess a patient's risk to inform treatment, it is rare for them to routinely employ empirically grounded psychometrically strong risk assessment measures. In fact, even board-certified forensic psychologists do not routinely use risk assessment measures (Archer, Buffington-Vollum, Stredny, & Handel, 2006). Practicing clinicians perceive dynamic, behavioral variables as more relevant in their assessment of violence than research-based variables (Elbogen, Mercado, Scalora, & Tomkins, 2002). Relatedly, despite the multiple findings that the Rorschach's (i.e., a projective test) relationship to violence is invalid and should not be admissible in court (see Lilienfeld, Wood, & Garb, 2000), it is still used in so-called "risk assessments." This can also be said for the Minnesota Multiphasic Personality Inventory (MMPI; Melton et al., 1997). Unfortunately, when clinicians rely on these types of measures they miss a more comprehensive and – perhaps accurate – assessment of an individual's risk of engaging in dangerous behaviors.

Can we predict who will commit the next mass shooting? This question might require a yes or no response, but it is clear from a review of the literature that it is impossible to provide a simple answer. Violent behavior is complex – as are our ways of predicting its occurrence. Mass shootings are undoubtedly extreme events and we are compelled to pay attention to them as they shake our society's sense of safety. As much as we would like to predict a person's likelihood of perpetrating a mass shooting, the bottom line is that we cannot 100% of the time predict anyone's extreme behavior. There is no proven formula for predicting behavior – especially a low base rate behavior such as mass shootings. However, we can use existing theories of violence risk assessment and prior empirical evidence to inform clinicians and aid them in making decisions.

Note

- 1 ROC curve areas are created based on an analytical technique similar to a cost-benefit analysis that plots the true positive rate against the false positive rate of a measure to compute a binary outcome. ROC analyses provide the probability of detecting group membership. ROC curve areas close to 1.00 indicate a highly sensitive measure.

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Part III

The Role of Media in the Aftermath of Mass Shootings

The Influence of Media on Public Attitudes

Jaclyn Schildkraut and H. Jaymi Elsass

When it comes to public attitudes about mass shootings, the media are key in shaping these beliefs. Assuming the role of “moral entrepreneurs,” as Becker (1963) refers to those individuals in an agenda-setting capacity, media producers are able to generate significant public concern about these events, including purported causes for why shootings occur, how to protect oneself against such an attack, and how often such incidents take place. Since most individuals never will be directly affected by a mass shooting event, media outlets serve as their main source of information (Graber, 1980; Surette, 1992). This information has significant bearing on public beliefs about mass shootings.

In order to understand the media’s influence on such attitudes, it is imperative to consider the media’s agenda-setting capabilities. Additionally, understanding the prevalence of news coverage devoted to mass shootings is important in determining how such an agenda is shaped and which events are given priority. Discussion also is offered regarding two key causal factors of mass shootings – gun control and mental health – and the subsequent shifts in public opinion. Such judgments may act as impetuses for change in the form of legislative responses to these events (Schildkraut & Hernandez, 2014; Soraghan, 2000). Finally, consideration is given to how public attitudes about mass shootings translate into other far-reaching impacts, such as perceived risks of victimization and fear of crime.

The Role of the Media in Agenda Setting

The mass media play an important role in society as they define and shape issues and events rather than just reflecting what is occurring in society (Barak, 1994; Gans, 1979). In a commentary on how the media contribute to the social construction of crime, Sacco (1995) notes that

The ways in which the news media collect, sort, and contextualize crime reports help to shape public consciousness regarding which conditions need to be seen as urgent problems, what kinds of problems they represent, and, by implication, how they should be resolved. (p. 141)

This process, known as agenda setting, enables the mass media to highlight particular attributes of a story that call attention to, and lend support for, claims made by individuals in positions of power or influence (Entman, 2007; McCombs, 1997; McCombs & Shaw, 1972; Weaver, 2007). The process of agenda setting focuses on how objects or issues are portrayed in the media and the amount of importance assigned to each object's particular attributes (McCombs, 1997; Surette, 1992; Weaver, 2007). Additionally, this process is concerned with the relationship between the media and the audience as opposed to how the media interact with social institutions (e.g., the government) to determine which issues are of increased saliency (McCombs & Shaw, 1972).

According to McCombs (1997), one of the main goals of agenda setting is to achieve consensus among the public about the importance of a particular issue, and the media are instrumental in generating this agreement. By highlighting certain stories as important (or, perhaps more accurately, as more important than others), news producers call attention to issues that either may directly or indirectly affect a particular community (Barak, 1994; McCombs, 1997; Reese, 2007). Over time, as more coverage is allocated to a particular issue, the saliency of that issue for the public likely increases, and eventually becomes a priority for the public's agenda (McCombs, 1997; Reese, 2007). Policies aimed at addressing the issue also can be pushed as part of the agenda (Entman, 2007). As Cohen (1963) notes, the media "may not be successful much of the time in telling people what to think, but it is stunningly successful in telling people what to think *about*" (p. 13).

Rarely, however, does the news or public agenda focus on more than a few key issues at a time (McCombs, 1997). This limited focus stems from the fact that few issues are able to command the consensus needed to maintain saliency (McCombs, 1997). Most often, the media focus on those issues that are the most serious or atypical in nature (Barak, 1994; Sacco, 1995) or those that threaten society's perceived stability (Gans, 1979), such as mass shootings. At the same time, this limited focus allows for a more complete, full-bodied discussion to take place in both the public and media forums. When an issue is of perceived importance, the media agenda is impacted as the demand for information increases (Scheufele & Tewksbury, 2007). Accordingly, how the mass media portray such issues impacts the way in which the public perceives and understands them (Barak, 1994; Scheufele & Tewksbury, 2007).

Prevalence of Media Coverage of Mass Shootings

When word of a mass shooting breaks, media producers are quick to provide live, continuous coverage, often straight from the scene. Such a practice first was evident during the 1999 Columbine High School shooting, when CNN aired six uninterrupted hours of coverage from Littleton (Muschert, 2002). Additionally, in the first week after the shooting, 53 stories, totaling nearly four hours of airtime, were broadcast on the three major news networks – ABC, CBS, and NBC (Maguire, Weatherby, & Mathers, 2002). In fact, these stations devoted no less than half of their nightly news airtime to stories about Columbine, and in the year following the shooting, over 300 individual stories were broadcast (Robinson, 2011). By comparison, 13 other school shootings that had occurred within the same time period garnered just slightly more coverage than Columbine when all of their stories were combined (Maguire et al., 2002).

Shootings occurring in later years followed this “breaking coverage” pattern. On the day of the 2007 Virginia Tech shootings, network news stations devoted 60% of their airtime to covering the story (Pew Research Center for the People & the Press, 2007a). Similarly, 76% of cable news airtime was allocated to coverage of the shootings (Pew Research Center for the People & the Press, 2007a). In fact, despite typical daily viewership of approximately 450,000 and 900,000 on CNN and Fox News, respectively (Garofoli, 2007), audience sizes surged to 1.4 million and 1.8 million viewers for these same networks on the day of the shootings (Pew Research Center’s Project for Excellence in Journalism, 2006). For three continuous days following the 2012 Sandy Hook Elementary School shooting, broadcasts on cable news networks, including CNN and Fox News, were live from Newtown (Applebome & Stetler, 2012; Askar, 2012). The networks’ coverage of the shootings translated into high levels of viewership (between 2 and 3 million viewers per hour), with one show – Wolf Blitzer’s *The Situation Room* (CNN) – rated second among adult audiences aged 18 to 49 (Kondolojy, 2012).

Such pervasive coverage is not limited to the television format; the newspaper medium also is prone to focus on mass shootings in its coverage. In the year following Columbine, approximately 10,000 articles were published in the nation’s 50 largest newspapers (Newman, 2006). Of these, 170 appeared in *The New York Times* alone in the first 30 days after the event (Chyi & McCombs, 2004; Muschert & Carr, 2006; Schildkraut & Muschert, 2014). Local coverage via *The Denver Post* was more than triple *The New York Times* in the quantity of articles – over 600 stories about Columbine were posted during the first 30 days (Schildkraut, 2014). During the same time frame following Sandy Hook, *The New York Times* published 130 articles (Schildkraut, 2014; Schildkraut & Muschert, 2014). High levels of coverage also were devoted to

shootings occurring outside of primary and secondary schools, including attacks at Virginia Tech in 2007, Fort Hood in 2009, a Tucson, Arizona political function in 2011, and an Aurora, Colorado movie theater in 2012 (Schildkraut, 2014).

With ever-advancing technology, newsmakers have begun to incorporate newer source formats into their production strategies to supplement the more traditional forms of media. This practice first was witnessed after Virginia Tech, when cell phone footage of the shooting, taken by a student and later uploaded through CNN's iReport feature, was aired by multiple news stations (Kellner, 2008; Schildkraut, 2012; Wigley & Fontenot, 2009). By that evening, the clip had received more than 1 million views (Stanley, 2007). Companion websites for cable news networks are also used regularly to augment television coverage and attract larger audiences. On the day of the Virginia Tech shootings, 108.8 million users logged on to MSNBC's website (Garofoli, 2007), compared to the average rate of 400,000 unique daily page views (TheWebStats.com, 2011).

Still, despite their inherent sensational nature, not all mass shootings garner the same amount of coverage (Schildkraut, 2014; Schildkraut, Elsass, & Meredith, 2015). The Columbine shooting is the archetypal event to which all other similar incidents are compared (Altheide, 2009; Kalish & Kimmel, 2010; Larkin, 2007, 2009; Muschert, 2007; Muschert & Larkin, 2007), primarily because it is perceived as the first of its kind. To date, no other incident, including Sandy Hook, has eclipsed the coverage of this earlier event (Schildkraut, 2014; Schildkraut & Muschert, 2014). Sandy Hook, in its own right, garnered considerable media attention as a result of the newsworthiness of the victims due to their young age. Sorenson, Manz, and Berk (1998) have noted that homicides in which victims are "white, in the youngest and oldest age groups, women, of high socioeconomic status, killed by strangers" (p. 1514) are seen as more newsworthy, and those killed in the Sandy Hook shooting embodied these characteristics.

In a separate examination, Schildkraut, Elsass, and Meredith (2015) found that the more victims, particularly fatalities, associated with an event, the more likely that shooting is to receive more prominent coverage (e.g., more articles, greater word counts). Those shootings occurring in the West, thus in closer proximity to Columbine, also received more coverage than those taking place in different regions of the country (Schildkraut, Elsass, & Meredith, 2015). The timing of events, with one shooting occurring in close temporal proximity to another, can also affect coverage patterns, particularly if the latter is considered less newsworthy than the prior incident. Such disparities in coverage have been observed following shootings at Heritage High School in Conyers, Georgia just 1 month after Columbine; Northern Illinois University in 2008, nearly 10 months after Virginia Tech; and a Sikh temple in Oak Creek, Wisconsin in 2012, only 2 weeks after Aurora.

The Gun Control Versus Right to Carry Debate

In the aftermath of mass shootings, one of the major issues at the center of the discourse is the debate between gun control and the right to carry. Proponents of gun control measures argue that tighter regulations will reduce the occurrence of mass shootings (Kleck, 2009; Schildkraut & Muschert, 2013; Schildkraut, Elsass, & Muschert, 2016; Wallace, 2015). Those on the opposite side of the debate advocate that the presence of armed citizens may stop future shooters and save lives (Kleck, 2009; Schildkraut & Muschert, 2013; Schildkraut et al., in press; Wallace, 2015). Much of the debate between these two camps takes place via the media. In fact, among the most commonly discussed causal factors of mass shootings, guns typically are the most frequently referenced (Schildkraut, 2014; Schildkraut & Muschert, 2013; Schildkraut et al., in press).

Public opinion with regard to the gun control debate has been shown to be influenced by the occurrence of mass shootings. A year after the 1999 shooting at Columbine High School, the Pew Research Center for the People & the Press (2000) found that support for gun control was at an all-time high – 66% of respondents approved stricter regulations, while just 29% favored protection of owners' rights (Carlson & Simmons, 2001; Connelly, 1999; Saad, 1999; Smith, 2002). In the following years, however, support for control measures began to wane while simultaneously increasing for gun rights (Pew Research Center for the People & the Press, 2014). The second highest peak for support was found just after the 2007 Virginia Tech shootings, with 60% of respondents favoring stricter regulations (Pew Research Center for the People & the Press, 2014). Other shootings, however, such as those at a political rally in Tucson, Arizona (Madison, 2011; Pew Research Center for the People & the Press, 2011) and an Aurora, Colorado movie theater (Blumenthal, 2012; Pew Research Center for the People & the Press, 2012a), failed to significantly impact the public's attitudes towards either side of the debate. Following the shooting at Sandy Hook Elementary School, support for gun control measures increased, albeit slightly (just 2% in one poll) from the Aurora massacre 5 months earlier (Pew Research Center for the People & the Press, 2012a; Saad, 2012a). Two years after Newtown, however, support for gun rights eclipsed support for regulation measures, due in part to the growing public perceptions that firearms are beneficial in protecting people from becoming crime victims (Doherty, 2015; Pew Research Center for the People & the Press, 2014).

In the wake of these events and in response to the subsequent reactions from the public, legislators are tasked to “do something” in order to address the perceived threat of future mass shootings. While the public often is torn on whether new laws should be passed or existing ones enforced (Pew Research

Center for the People & the Press, 2000; Saad, 2012a; Wozniak, 2015), many politicians opt for the former solution. Within 1 year of Columbine, over 800 pieces of legislation at both the state and federal levels related to firearms were introduced; only about 10% of these were enacted into law (Schildkraut & Hernandez, 2014; Soraghan, 2000). Following the December 2012 shooting at Sandy Hook, 23 bills aimed at gun control measures were introduced at the federal level alone in the first 75 days (Schildkraut, 2014). The state of New York also passed one of the most comprehensive gun control packages following the shooting (Hernandez, Schildkraut, & Elsass, 2015; “NYSafe Act Gun Reform,” n.d.).

Most often, the reform measures for firearms related to mass shootings focus on several key areas. One such area is what has been termed “the gun show loophole” (Kleck, 2009; Schildkraut & Hernandez, 2014), which refers to the ability to sell or transfer firearms between unlicensed private parties (Wintemute, 2013). Even though the public overwhelmingly supports background checks at gun shows (Saad, 2012a), such measures have failed to be implemented. After it was determined that three of the firearms used by the Columbine perpetrators were purchased at a gun show by one of their friends (neither shooter was of age to legally possess them at the time of the purchase), focus on closing this loophole appeared to be at an all-time high, even though the legislation had originally been introduced over a year earlier (Kleck, 2009; Schildkraut & Hernandez, 2014). While the state of Colorado did enact a law that made straw purchases such as this illegal (Soraghan, 2000), attempts to regulate background checks at a national level failed each time they were introduced (Schildkraut & Hernandez, 2014). Still, proposed measures aimed at strengthening background checks are often supported by public opinion, usually at a higher rate than other proposed regulations (Barry, McGinty, Vernick, & Webster, 2013; Carlson & Simmons, 2001; Doherty, 2015; McGinty, Webster, Vernick, & Barry, 2013; Wozniak, 2015).

Another key area of reform is the attempt to limit the type of weapons that civilians can own. According to Gallup public opinion polls, since the 1960s, the public consistently has opposed banning ownership of handguns by anyone other than law enforcement (Pew Research Center for the People & the Press, 2012c; Saad, 2012a). Most efforts to regulate firearms typically focus on assault weapons, even though they are used in just a fraction of these incidents (Fox & DeLateur, 2014; Mayors Against Illegal Guns, 2013). These guns characteristically resemble military weapons and often employ a semiautomatic firing mechanism, meaning that cartridges are automatically loaded into the firing position after each single shot without further action from the shooter (Kleck, 2009). Advocates of banning such weapons argue that their mechanisms allow for individuals to fire rounds more rapidly (Kleck, 2009). It is important to note, however, that the semiautomatic element is not solely limited to assault weapons. Many handgun models also bear this feature.

In 1994, Congress passed the Violent Crime Control and Law Enforcement Act, more commonly known as the Federal Assault Weapons Ban (AWB), which declared that it is “unlawful for a person to manufacture, transfer, or possess a semiautomatic assault weapon” (18 U.S.C. §§ 921–922). A list of 19 different firearms were banned under the act, and it contained a list of criteria to determine whether or not a gun constituted an assault weapon and thereby was prohibited (18 U.S.C. §§ 921–922; Singh, 1999). The ban, however, contained a sunset provision, meaning that it only was effective for 10 years before it would have to be renewed (Singh, 1999). Congress failed to reaffirm the legislation and it expired on September 13, 2004. Since its termination, a number of attempts to reinstitute federal regulations on such weapons have been introduced, but have not passed through Congress.

The effectiveness, or perhaps lack thereof, may have had an impact on public opinion related to such legislation. One of the weapons used in Columbine – the IntraTec Tec DC-9 – was illegal under the AWB, which was effective at the time of the shooting. The State of Connecticut also had an assault weapons ban in place at the time of Sandy Hook, but it is unclear whether the Bushmaster rifle used as the primary firearm in the shooting was prohibited at the time. Since the introduction of the AWB, public support for such a measure has subsided, dropping as much as 25% in some polls (Doherty, 2015). When support for such regulation is garnered, it typically is higher among nongun owners (Barry et al., 2013; McGinty, Webster, Vernick, & Barry, 2013; Wozniak, 2015). In some instances, opposition for a ban outweighs its support (Pew Research Center for the People & the Press, 2012b; Saad, 2012a). Further, as Fox and DeLateur (2014) note, the AWB had virtually no effect on the number of mass murders occurring, again potentially contributing to public perceptions of its ineffectiveness.

Another argument related to assault weapons is their ability to accept larger magazines, or more specifically, hold more bullets (Kleck, 2009). By limiting the number of rounds a clip will hold, this would force the shooter to have to reload more frequently, thereby creating opportunities for other individuals to either engage them or escape (Best, 2013; Kleck, 2009). Under the AWB, magazines capable of holding more than 10 rounds were considered to be large capacity and were prohibited for civilian-used firearms (Kleck, 2009; Schildkraut & Hernandez, 2014). This provision expired with the ban. Yet as Kleck (2009) and others have noted, such attempts to regulate the size of ammunition clips may be largely irrelevant as many mass shooters use multiple guns and magazines. Still, by and large, members of the public support proposed limitations on magazine capacities (Barry et al., 2013; Doherty, 2015; McGinty, Webster, Vernick, & Barry, 2013; Pew Research Center for the People & the Press, 2012c; Saad, 2012a). Such support, however, has failed to translate into enacted legislation, even after the Aurora movie theater shooter was found to have used a 100-round drum magazine (Dao, 2012).

A concern for many of the measures discussed here is that they regulate the masses, many of whom are responsible, law-abiding gun owners, in an attempt to prevent a statistically rare attack. What is more problematic with this line of thinking is that there are a number of issues with how the shooters are acquiring their firearms. For example, the shooters at Virginia Tech, Tucson, and Aurora used firearms in the attacks that were purchased legally in that the perpetrators passed all of the necessary background checks (even though they should have been excluded from such approvals due to mental health issues, as discussed in the next section). Others, such as the Thurston High School (1998) and Sandy Hook shooters, had free-range access to firearms that were purchased legally by a member of their family. A third group of shooters, including the 11-year-old and 13-year-old perpetrators of the 1998 Westside Middle School shooting in Jonesboro, Arkansas, acquire their weapons by theft (Kleck, 2009; Schildkraut & Hernandez, 2014). In all three scenarios, any of the proposed measures discussed here would have been largely ineffective. Still, the way in which the media frame the issue of gun violence after mass shootings has had a considerable impact on public attitudes about these events and the weapons that are used.

Mental Health and Mass Shooters

Aside from gun control, the mental health status of the perpetrators also often is called into question when determining why the shootings occurred. While this “usual suspect” routinely makes its way into the public discourse after such an event (Schildkraut, 2014; Schildkraut & Muschert, 2013; Schildkraut et al., 2016), it has been especially predominant in three key cases – Virginia Tech (2007), Tucson (2011), and Sandy Hook (2012). Following each of these shootings, information surfaced that each of the perpetrators had a long documented history of mental health issues. The Virginia Tech shooter suffered from major depressive disorder and selective mutism, an extreme form of social anxiety (Virginia Tech Review Panel [VTRP], 2007). The Tucson shooter, who killed 6 and wounded 13 others, including Congresswoman Gabrielle Giffords, had a history of schizophrenia and other psychological difficulties (Gassen & Williams, 2013). The Sandy Hook shooter had been diagnosed with Asperger’s syndrome, a high functioning form of autism, at an early age (Hernandez et al., 2015).

In response to these events, a number of legislative measures were proposed, aimed at addressing the perceived dangerousness of individuals with mental health concerns (Hernandez et al., 2015; Schildkraut & Hernandez, 2014). A number of these proposals linked the issues of gun control and mental health, and centered on keeping firearms away from those who are mentally ill (Barry et al., 2013; McGinty, Webster, Vernick, & Barry, 2013). Support for this

proposal is common among both gun owners and nonowners alike, regardless of political party ideology (McGinty, Webster, Vernick, & Barry, 2013).

Following the Virginia Tech shooting, for example, the investigation revealed that in December 2005, less than two years before the attack, the shooter had been involuntarily committed after threatening a fellow student (VTRP, 2007). The shooter was found to be mentally ill, refused to voluntarily seek treatment, and posed an imminent danger to himself and others, all of which are grounds for inpatient counseling. Regardless, he only was ordered to participate in outpatient treatment and he never followed up to receive these services (Bonnie, Reinhard, Hamilton, & McGarvey, 2009; VTRP, 2007). The shooter's detention at the behavioral health facility was never reported to the state's background check system as was mandated. This ultimately created the opportunity for him to legally acquire the firearms used in the shooting (Schildkraut & Hernandez, 2014). He purchased two guns, 30 days apart (in accordance with Virginia's required waiting period), with proof of residency and a photo ID (Roberts, 2009).

In the immediate aftermath of the shooting, then-Governor Timothy Kaine signed an executive order requiring the immediate reporting of any individual who had been deemed a danger to themselves or others to all relevant databases (Schildkraut & Hernandez, 2014). Similar legislation aimed at improving reporting was enacted in 12 other states (Brady Campaign Press Release, 2011). At the national level, President Bush signed into law the NICS Improvement Amendments Act in early 2008 (H.R. 2640, 2007; Schildkraut & Hernandez, 2014). The law was designed to require more frequent records updates, improve the speed of reporting, and promote better coordination between state and federal agencies (NICS Improvement Amendments Act, 2007; Schildkraut & Hernandez, 2014). Additionally, approximately \$1.3 billion in federal funding was allocated to facilitate the establishment or updating of reporting systems at the state level (NICS Improvement Amendments Act, 2007; Schildkraut & Hernandez, 2014). In the first 5 years after the shooting, however, just \$50 million was appropriated to make such improvements (Brady Campaign Press Release, 2011).

Similar concerns over mental health and mass shooters were prevalent after the Sandy Hook shooting, fueled by the revelation that the gunman had a long-standing diagnosis of Asperger's syndrome. Even though individuals with this diagnosis rarely are violent – approximately 2% of patients have exhibited aggressive behaviors towards people outside of their own family and no single individual has been found to use a weapon during a confrontation (Harmon, 2012) – the need for response filled the national discourse. Within the first year after the shooting, a number of recommendations were made to address mental health concerns in the United States (The White House, 2013). Just prior to the 1-year anniversary of the shooting, the Obama Administration pledged \$100 million to increase services for individuals with mental health concerns

(Fox, 2013). Despite such funding, and in spite of budget cuts nationwide, most of the changes related to mental health care were seen at the state level. It was difficult, if not impossible, to discern if such changes were in response to Sandy Hook or the passage of the ObamaCare law that coincided with the shooting (Hernandez et al., 2015).

Regardless of advances made in the United States to reduce the stigmatization of mental illness, the introduction of such a concern into the discourse about mass shootings can affect public opinion as it relates to this particular issue. Following both the Tucson and 2013 Washington, DC, Navy Yard shootings, the failure of the mental health system to identify dangerous individuals was blamed in polls more than both access to firearms and violent media (Newport, 2011; Pew Research Center for the People & the Press, 2011; Saad, 2013). A similar trend also was evident after the Virginia Tech shooting (Pew Research Center for the People & the Press, 2007b). In one study, McGinty, Webster, and Barry (2013) found that individuals who consumed media coverage of a mass shooting were more likely to hold negative beliefs about individuals with mental illness. Such attitudes not only may impact support for policies (McGinty, Webster, & Barry, 2013), but also people's reactions to mass shootings more broadly. Wilson, Ballman, and Buczek (in press) similarly found that the way in which mental health is framed in news articles can influence public attitudes about mass shooters and the broader issue itself.

Perceptions of Safety and Fear of Crime

As noted at the outset of this chapter, the media serve as the primary source of information about mass shootings for the public, as most individuals never will directly experience such an incident. Nearly 95% of the population relies on the media for information pertaining to crime more generally (Graber, 1980; Surette, 1992). While upwards of 50% of news coverage typically is devoted to stories about crime (Maguire et al., 2002; Pollak & Kubrin, 2007; Surette, 1992), due to space and time constraints, the most serious and violent incidents receive the majority of attention (Chermak, 1995; Graber, 1980; Gruenewald, Pizarro, & Chermak, 2009; Mayr & Machin, 2012). Even still, not all events will be covered, and of those that are, they may not garner equitable amounts of coverage (Chermak, 1995; Gruenewald et al., 2009; Schildkraut, Elsass, & Meredith, 2015). Further, by focusing on only the most severe or extreme cases, the media give audiences a distorted understanding about crime (Barak, 1994; Maguire et al., 2002; Robinson, 2011).

Beyond influencing public opinion about issues such as gun control and mental health, the media coverage of mass shootings has a number of additional impacts on individuals' perceptions of such events. The amount of coverage and the way in which the stories are framed can affect how people perceive

their likelihood of becoming a victim of a mass shooting or heighten their fear of crime in general. It is important to note that nearly all of the research conducted on fear of and perceived likelihood of crime following mass shootings has focused specifically on school shootings. Given the similarities between school shootings and mass shootings more generally, however, these findings can likely be extrapolated to the public more broadly. Public opinion polls also have been used to capture some of these perceptions.

Mass shootings have been shown to elicit perceptions that one's likelihood of victimization in such an event is higher than it actually is. Following Columbine, for example, Gallup found that more than 6 in 10 respondents (66–68%) agreed that there was some likelihood a similar event could happen in their own community (Gillespie, 2000; Saad, 2012b). This increased to 73% agreement following the 2005 shooting at a high school in Red Lake, Minnesota (Saad, 2012b). Interestingly, following the Sandy Hook shooting, only 52% of respondents expressed the belief that a similar attack could happen (Saad, 2012b). Further, respondents who were female, white, from the eastern region of the United States, and those living in suburban communities were more likely to report such agreement (Saad, 2012b). In the wake of the 2007 Virginia Tech shootings, college students also were likely to perceive that similar attacks could happen again (Fallahi, Austad, Fallon, & Leishman, 2009).

The problem with these perceptions of risk is that they are highly disproportionate to one's actual statistical likelihood of being a victim of a mass shooting. In the six school years preceding Columbine (1992/1993 through 1997/1998), researchers found that there were 226 deaths attributable to school shootings (Bernard, 1999; Donohue, Schiraldi, & Ziedenberg, 1998). In the same time frame, over 50 million students were enrolled in more than 80,000 schools across the nation (Sanchez, 1998). Therefore, the likelihood of any of those students falling victim to a school shooting was less than .00005%. These same students were significantly more likely to be struck by lightning (Bernard, 1999; Donohue et al., 1998), which in itself is a rare occurrence.

Despite the statistical unlikelihood of one becoming the victim of a mass shooting, people still remain fearful of such a possibility. Perceived risk of victimization and fear of crime are separate constructs, yet they often are used interchangeably (Warr, 2000; Warr & Stafford, 1983). Researchers contend that fear actually is caused by one's perceptions of one's risk of victimization (Warr, 2000; Warr & Stafford, 1983). Additionally, Ferraro (1995) elaborates that perceived risk is cognitive, while fear of crime is emotional. Most academic studies examining perceptions of mass shootings have focused on fear of crime.

Following Columbine, Addington (2003) reported that students expressed being more fearful at school after the shooting as compared to prior to the attack. Similarly, Brener, Simon, Anderson, Barrios, and Small (2002) found that students were more fearful after the shootings and, as a result, were more likely to avoid attending school. Fallahi and colleagues (2009) found that the

more students consumed media coverage of the Virginia Tech shootings, the more fearful they reported of being attacked. Kaminski, Koons-Witt, Thompson, and Weiss (2010) found that both the Virginia Tech and the Northern Illinois University shootings increased fear of crime on campus, being murdered, and being attacked with a weapon.

Not all reactions specifically are related to a particular event. Instead, such perceptions may be attributable to the phenomenon of mass shootings more generally. Schildkraut, Elsass, and Stafford (2015) examined reactions to school shootings in the context of moral panics. They found that college students with greater fear of personal victimization (e.g., being murdered or attacked with a weapon) expressed more punitive attitudes towards school shooters (Schildkraut, Elsass, & Stafford, 2015). Those respondents who were more fearful also were more likely to believe that these events were occurring more frequently than they actually were and were more likely to subscribe to the idea of a moral panic over school shootings (Schildkraut, Elsass, & Stafford, 2015). In a separate study, Elsass, Schildkraut, and Stafford (2014) examined the role of media consumption in attitudes about school shootings. They found that social media usage, and Twitter in particular, led to greater beliefs that school shootings were a major problem in the United States (Elsass et al., 2014). In sum, this body of literature indicates that members of the general public hold disproportionate beliefs about mass shootings and that these attitudes are driven largely in part by the media coverage of such events.

Conclusion

Mass shootings have the ability to elicit considerable media attention, which translates into high levels of viewership. After the Columbine shooting, over 90% of people reported following the shooting either fairly or very closely (Pew Research Center for the People & the Press, 1999). In fact, the shooting was the top story of the year and the third most closely followed event behind the 1992 Rodney King verdict and the 1996 TWA airline crash (Pew Research Center for the People & the Press, 1999). Sandy Hook also was highly followed, with 87% of people reporting they paid close attention to the coverage (Saad, 2012b). Other mass shooting events, including Thurston High School (1998), Westside Middle School (1998), Virginia Tech, and Fort Hood (2009), garnered considerable interest from media audiences (Pew Research Center for the People & the Press, 2007a, 2009).

Beyond the issues discussed in this chapter, broader implications exist for media coverage of mass shootings. Some specific events, such as the Sandy Hook shooting, have been perceived as reflecting broader issues within society ("Washington Post-ABC News Poll," n.d.). Others, including Virginia Tech, Tucson, and Aurora, are perceived to be isolated acts of troubled individuals

(“Washington Post-ABC News Poll,” n.d.). Regardless of which stance a person takes, the media has been shown to have a strong influence on public attitudes regarding mass shootings. Accordingly, researchers must continue to examine both the coverage itself and its effects on consumers to understand the full impact of these events on society.

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Social Media and News Coverage as Vicarious Exposure

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Research on the etiology of posttraumatic stress disorder (PTSD) has uncovered several biological, psychological, and social factors that contribute to both its development and maintenance. The severity of symptoms of PTSD is determined in large part by the degree of exposure to a traumatic stressor (Besser, Zeigler-Hill, Weinberg, Pincus, & Neria, 2015). For example, experiencing a violent crime firsthand – no matter the type – places an individual at greater risk for symptoms of PTSD than more indirect exposure. However, in the twenty-first century, modern technology has contributed an additional component or method by which individuals may experience trauma. From worldwide terrorist attacks and natural disasters to local crime and violence, everyday television, newspapers, radio, and the Internet provide millions of individuals and communities with a stream of play-by-play coverage of any and all types of trauma (Swenson & Henkel-Johnson, 2003). At any given moment of the day, viewers are able to tune in and receive the latest reports of these events and media stories. With this increase in information about traumatic events readily available at one's fingertips, psychologists have investigated the potential deleterious effects of vicarious or secondhand exposure to trauma (Pearlman & MacIain, 1995). Information on the effects of vicarious exposure should also be readily available to mental health workers and parents alike, allowing guidance and recommendations to reduce the unintended symptoms associated with exposure. This chapter provides a review of both direct and indirect exposure to trauma, with special attention to the effects of vicarious exposure to media coverage of school shootings.

Even though the impact of vicarious exposure has been addressed within the psychological literature, only a few studies have investigated and can attest to the effect of such exposure following the unparalleled and unique situation of a mass shooting. The ability and tendency to replay and rewatch graphic scenes on news networks have led to viewers' and community members' widely held beliefs that mass shootings are not only prevalent but are also likely to occur at

one's own neighborhood school, mall, or movie theater (Lawrence & Mueller, 2003). In fact, a direct relationship exists between the level of violence and consequent media coverage of mass shootings: A greater level of violence seen during a particular event translates into more widespread coverage of that particular event within the news. In other words, a higher degree of media coverage on major networks is observed when the incident is more violent (Maguire, Weatherby, & Mathers, 2002). Similarly, vicarious exposure to this type of media coverage increases risk for symptoms of PTSD, exacerbates current symptoms, as well as increases the likelihood of prolonged distress in individuals and communities recovering from these incidents (Jemphrey & Berrington, 2000). The effects of direct exposure to trauma are well-documented; however, the influence of indirect exposure through media is less well known and warrants further study (Swenson & Henkel-Johnson, 2003).

Direct Exposure to Trauma

Direct exposure to a traumatic incident has been found to significantly increase risk for PTSD symptoms (Kim et al., 2009). Many well-documented events in history have produced survivors with symptoms of trauma. The terrorist attacks occurring on September 11, 2001 (9/11) is the quintessential example. Those survivors who directly experienced trauma were at risk for acute stress disorder (ASD) and PTSD. Galea et al. (2003) examined the prevalence of probable PTSD in the general population in New York City during the first 6 months following the 9/11 attacks. They found that immediately following the incident, 7.5% of their sample met the criteria for probable PTSD and that number declined to 0.6% 6 months later. Furthermore, several other studies show the impact of firsthand and secondhand exposure as an occupational hazard. Police, mental health workers, and medical personnel, all of whom worked with the victims of 9/11, were also considered to be at risk for the development of ASD and PTSD.

More specific to the topic of this chapter, several studies have documented the effects of direct exposure to mass shootings. The April 16, 2007 shooting at Virginia Polytechnic Institute and State University (more commonly known as Virginia Tech) was associated with high levels of PTSD in over 15% of respondents on an evaluation administered 4 months following the incident. Higher levels of PTSD symptoms were found in those respondents who were unable to confirm the safety of friends or those with a close friend killed (Hughes et al., 2011). Similarly, following the November 7, 2007 shooting at Jokela High School in Finland, Suomalainen, Haravuroi, Berg, Kiviruusu, and Marttunen (2010) found that direct exposure to the trauma, being older, and being female were associated with more severe PTSD symptoms. For more information on the effects of direct exposure to mass shootings, please refer to Chapter 11.

As discussed in relevant research, individuals who have survived trauma are more likely to demonstrate negative stress reactions including psychological and behavioral changes (Galea et al., 2002; Schlenger et al., 2002; Schuster et al., 2001) and they may meet the criteria for ASD and/or PTSD based on the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; American Psychiatric Association, 2013). Specifically, PTSD became an official American Psychiatric Association (APA) classification in DSM-III (American Psychiatric Association, 1980) and, in this edition, it emphasized trauma – experiences that are so horrific that they would cause most victims to develop a negative reaction, as opposed to more ordinary stressors (Friedman, 2014). In subsequent publications of the DSM, this requirement or definition of trauma has been the source of controversy (Shally-Jensen, 2013). Within the psychiatric community, concern over the restricted definition of trauma (e.g., perceived as life threatening) led to concerns about missing serious symptoms because the event did not rise to this threshold. Other critics worried about the overuse of the PTSD diagnosis. DSM-IV-TR (American Psychiatric Association, 2000) broadened the types of exposure, including both direct and indirect, and relied on a more subjective standard – highlighting that a person “perceived” harm (Scott, 2015). In the DSM-5 (American Psychiatric Association, 2013), exposure to a traumatic event continues to be required for the diagnosis; but a negative emotional reaction to trauma experienced vicariously through media exposure no longer satisfies Criterion A, unless the exposure is related to one’s work (American Psychiatric Association, 2013; Friedman, 2014; Tasman, Kay, Lieberman, First, & Riba, 2015). The removal of vicarious exposure through media from the DSM-5 criteria emphasized that research has not shown a high prevalence of PTSD from that type of exposure (Friedman, 2013, 2014; Zoellner, Bedard-Gilligan, Jun, Marks, & Garcia, 2013).

Indirect Exposure to Trauma or Vicarious Trauma

Vicarious trauma, occasionally termed secondary trauma (Pearlman & Saakvitne, 1995; Regehr, Hemsworth, Leslike, Howe, & Chau, 2004) or secondary traumatic stress (Rogers, 2013), is the response to witnessing violence indirectly. Vicarious trauma has been studied in many different areas, including professionals exposed to trauma based on their career, as well as the more controversial line of research examining vicarious trauma associated with media exposure to violence.

Vicarious trauma has been often used in response to professionals who work extensively with trauma patients. In this type of exposure, the therapist does not experience the trauma firsthand, but nonetheless, manifests symptoms similar to PTSD, which include reexperiencing of the trauma, avoidance of anything that reminds the person of the trauma, alterations in mood,

psychological numbing, and hyper-arousal. Secondary exposure as the result of hearing stories of trauma patients can lead to symptoms that are chronic, influence both thoughts and emotions, as well as cause a negative shift in cognitive schemas (Pearlman & Saakvitne, 1995; Regehr et al., 2004). These symptoms are similar to PTSD, but are considered at a lesser intensity.

Secondary trauma can affect social workers, psychologists, and counselors (McCann & Pearlman, 1990; Zosky, 2013), especially when working with very high stress cases such as childhood sexual abuse (Sommer & Cox, 2005). Aparicio, Michalopoulos, and Unick (2013) and Sommer and Cox (2005) discovered that social workers exposed to trauma by virtue of listening to the traumatic histories of their clients experienced both affective and cognitive symptoms. Similarly, McMann and Pearlman (1990) and Zosky (2013) found that helping professionals who work with clients with trauma experience long-term effects on their mental health, relationships, and worldview (Arnold, Calhoun, Tedeschi, & Cann, 2005). Evidence for such long-term effects can be seen in a study by Sexton (1999), who showed that vicarious traumatization results from the accumulation of listening to many clients in multiple therapy situations. This accumulation of experiences may lead to symptoms that include PTSD, anxiety, depression, loss of hope, concerns about control and safety, and substance use (Pearlman & Saakvitne, 1995; Vlahov et al., 2002). Furthermore, Lugris (2001) found that a therapist's previous experience with trauma, sexual history, and perceived social support influenced the experience of symptoms of hyper-arousal and severity of cognitive distortions. Other careers also have this risk in which exposure to chronic trauma is a hazard of the job (Regehr et al., 2004). Fields potentially at risk for vicarious exposure to trauma include journalists (See Chapter 14; McMahon, 2001), police personnel (See Chapter 13; Brown, Fielding, & Grover, 1999), and teachers (Auger, Seymour, & Roberts, 2004).

Vicarious Exposure to Media Violence

Other forms of indirect or vicarious exposure that have been studied include media violence or violent programming, such as videogames, movies, and television shows, which may also result in a plethora of negative symptoms (Cantor, 2000). The study of vicarious exposure through the media chronicles various psychological reactions, including lower-intensity PTSD symptoms as the result of watching trauma unfold on television, the Internet, and other media outlets (Ben-Zur, Gil, & Shamshins, 2012). As an example, exposure to media violence historically has been correlated with an increase in behavioral problems, the formation of aggressive scripts in memory, and hostile attributional biases (Huesman, Moise-Titus, Podolski, & Eron, 2003). Some research has also suggested a link between heavy viewing of media violence and later aggression (Bushman & Anderson, 2001; Paik & Comstock, 1994), an increase in

negative mood states (Caprara, Renzi, Amolini, D'Imperio, & Travaglia, 1984), and aggressive behaviors and emotions (Anderson et al., 2003). Children who are exposed to high levels of media violence display higher levels of real-world violence and aggression (Huesmann & Taylor, 2006). However, it should be noted that Huesmann and Taylor (2006) conclude that the relationship between media violence and aggression or "real-world" violence is complex, with several variables contributing, which include the type of violence, the amount of exposure, and several characteristics of the individual (e.g., age, gender, intelligence, level of aggressiveness) as well as social influences, such as socioeconomic status, influence of the neighborhood, and parental influence.

Several studies examining the connection between viewing traumatic events in the media and children's stress reactions have documented a relationship between TV viewing and PTSD symptoms (Pfefferbaum et al., 2000; Pfefferbaum et al., 2001). In one study, Pfefferbaum (2001) surveyed over 2,000 middle-school children following the 1995 Oklahoma City bombing and found that strong emotional reactions to the incident and high television exposure were predictive of more PTSD symptomatology. In fact, the effects of this trauma were so intense that they were still apparent 7 weeks after the bombing (Pfefferbaum et al., 2001). In another study on the Oklahoma City bombing, Pfefferbaum, Seale, Brandt, Doughty, and Rainwater (2003) examined PTSD reactions in children who belonged to a community 100 miles away from the bombing and found that both media exposure and print exposure were associated with ongoing PTSD reactions in 88 sixth-graders.

Similar results were found in the Ben-Zur et al. (2012) study of the frequency of exposure to media coverage of the 9/11 terrorist attacks and subsequent levels of posttraumatic symptoms and distress. Other researchers studying the 9/11 coverage discovered that, as media viewing increased in the first seven days following the terrorist attack, so did the potential for probable PTSD (Ahern, Galea, Resnick, & Vlahov, 2004). Also, those who watched the most coverage of 9/11 (i.e., people in the highest third of viewing) showed 2.32 times greater odds for probable PTSD as compared with people in the lowest third of viewing. Schuster et al. (2001) conducted a national study to examine the reactions of adults and their children to the 9/11 terrorist attacks. They found that 44% of their sample exhibited at least one symptom of PTSD. Furthermore, a notable observation, 34% of the sample restricted their children's television viewing, understanding the potential negative consequences of allowing their children unrestricted television viewing of the attacks. Finally, Swenson and Henkel-Johnson (2003) examined reactions to the 9/11 attacks in a college community and found that 76% demonstrated one or more symptoms of PTSD and 32% reported three or more symptoms 3 months after the attack. The most common symptoms reported included hyper-vigilance, anxiety, and apprehension about the future.

Even what may be considered to be more positive images of 9/11 displayed through media yielded similar results. Saylor, Cowart, Lipovsky, Jackson, and Finch (2003) showed evidence of this perhaps unexpected outcome when they surveyed 179 students who were indirectly exposed to media coverage approximately one month after the 9/11 attacks. They showed that both negative and positive images (e.g., heroic images of 9/11) were significantly related to an increase in PTSD symptoms.

In another study examining students enrolled in a class about dream interpretation, Propper, Stickgold, Keeley, and Christman (2007) saw that every hour of television viewing of the attacks on New York City was associated with increased dream content related to 9/11. The authors concluded that dream content changed due to the traumatizing effects of the television exposure. Furthermore, these findings may show that the repeated viewing of horrific images could result in increased levels of stress and trauma in the general population. In another study on the effects of 9/11 on a college community, Swenson and Henkel-Johnson (2003) found that both faculty/staff and students showed symptoms of PTSD with heavy viewing of 9/11 coverage, with faculty and staff showing more severe symptoms.

Media Coverage of Mass Shootings

Just as the media responds to other traumatic events, in the case of mass shootings, news networks approach broadcasting with avid interest and ample coverage. Specific to mass shootings, however, the intense media coverage has led to an increase in the level of fear of violence in seemingly safe locations, such as schools and restaurants, due to frequent dramatizations of the potential threat of mass shootings within the community (Burns & Crawford, 1999). Rogers (2013) noted that the media coverage allowed the world to witness images of the Newtown murders and other highly covered tragedies, leading to concern that these tragedies could occur close to home.

Similar to the coverage of the terrorist attacks of 9/11, graphic images of mass shootings, such as the 2007 Virginia Tech tragedy, were replayed in the media for weeks following the incident (Fallahi & Lesik, 2009). On April 20, 1999, two students killed 12 students and 1 teacher and wounded 21 others prior to committing suicide at Columbine High School in Littleton, Colorado. Consistent with the broadcasting of other tragic events, the images of this tragedy were aired continuously (Addington, 2003). With that said, however, a key difference for this event could be noted. While we might expect violence in a war zone, traumatizing images of school-aged victims struck fear into communities' hearts and cultivated a concern for the safety of schools, a long-time considered safe place to send our children. In a similar vein, Roe-Berning and Straker (1997) found that as exposure to trauma increased, perceived

invulnerability decreased in the case of both direct and indirect trauma. In other words, the campus – which at one time served as a safe haven for students and faculty alike – was now a reminder of the possibility of violent attacks directed towards innocent victims at any given moment. Under this current state of fear, feelings of vulnerability or a lack of protection permeated the school community.

On April 16, 2007, a 23-year-old student murdered 32 people and wounded 25 others prior to committing suicide at Virginia Tech in Blacksburg, Virginia. The media coverage was extensive. Fallahi and Lesik (2009) examined the response of students at a large state university in the northeast following the tragedy at Virginia Tech. They hypothesized and found a relationship between vicarious exposure through the news media and acute stress symptoms. As previously stated, acute stress symptoms are similar to symptoms of PTSD, but occur in the first few weeks of an exposure to a trauma.

In their study, 145 female and 167 male participants from undergraduate and graduate psychology courses estimated the number of hours they spent viewing news coverage of the Virginia Tech shootings, including both TV and Internet viewing. These participants were then assessed again approximately three weeks after the incident had occurred and were asked to rate their own symptoms of depression, anxiety, and stress (ranging from “not at all” to “very much so”). Self-ratings of ASD symptoms were obtained as extracted from the DSM-IV-TR (American Psychiatric Association, 2000). They included:

- Intrusive thoughts: experiencing thoughts associated with the case.
- Sleep disturbance: experiencing sleep disturbance – for example, trouble falling asleep, trouble staying asleep at night, and sleeping longer than usual.
- Appetite disturbance: experiencing either an increase or decrease in appetite.
- Nightmares: experiencing nightmares.
- Fear: increasing feelings of fear that something like the Virginia Tech case could either happen again somewhere else or at this university.
- Stomach upset: experiencing gastrointestinal distress – for example, upset stomach and butterflies in your stomach.
- Depressive symptoms: experiencing a sad or down mood.
- Symptoms of suicide: experiencing an increase in suicidal ideation.
- Disorganization: feeling disorganized, confused, and “in a daze.”
- Alcohol and drugs: an increase in alcohol or drug use.
- Replaying the event: reliving the trauma of the Virginia Tech case involuntarily.
- Anger: experiencing symptoms of anger.
- Guilt: experiencing symptoms of guilt.

The authors were able to conclude that an increase in TV/Internet viewing of the Virginia Tech case often coincided with an increased likelihood of experiencing acute symptoms of intrusive thoughts, sleep disturbance, distraction, fear, stomach upset, depression, disorganization, replaying of the event, and symptoms of anger. The probability of experiencing acute symptoms of intrusive thoughts, sleep and appetite disturbance, distraction, fear, stomach disturbance, and anger were less than 9% for media viewing of 10 hours and ranged from 30% to 62% for 40 hours of exposure to the case. For suicide, disorganization, and replaying, the probability of experiencing acute symptoms was less than 3% for 10 hours of media exposure and ranged from 3.55% to 10.73% for 40 hours of exposure. Furthermore, through this study, researchers found that, for each additional hour watched of the Virginia Tech shootings media coverage, the odds of experiencing acute symptoms increased from 1.48 to 3.20, depending on the symptoms. Finally, they also found that female participants responded with more symptoms of fear as compared to males in the sample. This study improved upon past research by allowing for the prediction of the probability of experiencing acute symptomatology as the result of vicarious exposure to violence. In another way, this study allowed researchers to quantify the magnitude of the relationship (Fallahi & Lesik, 2009).

Similar to the aforementioned research, other studies focusing on both adults and children who have been exposed to mass shootings have also delineated the potential psychological aftermath of vicarious exposure to trauma for both individuals and communities. Addington (2003) found that a slight fear of victimization at school increased following the Columbine shootings. In one such study about the community, Palinkas, Prussing, Reznik, and Landsverk (2012) found that, in an analysis of two separate school shootings occurring at different high schools in San Diego County, higher incidences of PTSD at the community level were yielded as a result.

What We Know About Vicarious Exposure to Trauma

Based on previous research, a number of variables are recognized and considered predictive of the severity of symptoms resulting from vicarious exposure to trauma. They include the following.

Media coverage

Early studies examining children's media consumption initially focused on the amount of television viewing (Pfefferbaum et al., 2013). What was concluded from this research was that the more time spent watching information about tragedies being reported, discussed, or interpreted in news reports as well as other media outlets, the more significant the subsequent symptoms of trauma (Fallahi & Lesik, 2009).

Symptoms persist

Holmes, Creswell, and O'Connor (2007) examined London children who had watched television coverage of the 9/11 attacks. They found that the children experienced symptoms immediately after viewing television coverage, as well as experienced ongoing PTSD symptoms at 2 and 6 months after the event, showing that acute symptoms may place individuals at risk of more long-term and persistent difficulties.

Prior history of trauma-related problems and/or other psychiatric problems

While individuals in the general population may be at increased risk of developing ASD or PTSD after directly experiencing a traumatic event, a few subgroups are even more likely to experience symptoms depending on their mental health history. Specifically, a history of PTSD or other trauma-related difficulties places children, adolescents, and adults at increased risk for problems associated with both direct and vicarious exposure to trauma (Regehr et al., 2004). In addition, Maercker and Mehr (2006) hypothesized that media reports may lead to retraumatization of those victims already suffering trauma, which would only serve to impede their recovery.

Although Maercker and Mehr (2006) pointed to the potential for retraumatization, Rosen, Tiet, Cavella, Finney, and Lee (2005) maintained a slightly different conclusion based on their study. They sought to evaluate whether or not patients suffering from PTSD perceived their ongoing functioning to be impaired by the 9/11 attacks and subsequent events, whether or not patients' functioning changed significantly from predisaster levels, and how the amount of exposure to media coverage predicted changes in their functioning over time. In contrast to previous research pointing to the possible negative outcomes of high-volume vicarious exposure, this study led researchers to conclude that this association may reflect the negative social effects of isolative television viewing habits rather than retraumatization. Despite a lack of an increase in distress, half of the patients attributed problems in functioning to 9/11 and its aftermath, especially those participants who viewed more 9/11 media coverage (Rosen et al., 2005).

With a prior history of trauma, Gil-Rivas, Silver, Holman, McIntosh, and Poulin (2007) point to an additional risk of such individuals to exhibit further symptoms. In their study, a nationally representative group of adults and their adolescent children in a geographically distant location were examined. It was discovered that both adolescents' acute stress reactions as well as their prior mental health history were often associated with PTSD. Similarly, in a study examining the mental health response to 9/11, almost 40% of those receiving clinical treatment for the traumatic event had a preexisting PTSD and/or other

emotional and psychiatric diagnosis (Pfefferbaum et al., 2013). Therefore, it may be difficult to distinguish between the onset of new symptoms, and an exacerbation of past symptoms following vicarious exposure to trauma. This is a well-known phenomenon that clinicians often witness. As an example, although the effects of exposure to trauma often decrease with time, one notable exception evidenced in relevant literature is the media effects on those previously diagnosed with PTSD or who have subclinical PTSD (van der Kolk, 1994; Wolfe, Erickson, Sharkansky, King, & King, 1999). For many individuals in this subgroup as well as others without a history of mental health problems, high exposure to violent media coverage may lead to physiological arousal, which can stimulate trauma-related memories and reinforce the meaning of those events, thereby increasing the chances of subclinical PTSD or ASD becoming PTSD.

High exposure to violent media is not limited to those with a history of diagnosis. Rather, television, radio, Internet, and other media outlets facilitate such viewing for people with various mental health backgrounds living around the world. When speaking to the sheer number of viewers of the 9/11 attacks, a rough approximation contends that at least 100,000 people witnessed firsthand the 9/11 events while millions of others watched the horrific scenes through the media (Yehuda, 2002). Specifically, Yehuda (2002) quantified the impact of the World Trade Center attack in terms of those who experienced the event directly and those who watched the media accounts of the attack. She suggests that 35% of the people who were directly involved with the attack developed symptoms of PTSD. In addition, those who watched coverage of the event developed symptoms as well. Specifically, the longer the exposure to media coverage of the event, the more likely people are to develop symptoms of PTSD. However, vicarious exposure to traumatic events through the media may yield a greater possibility of negative effects for those with a preexisting psychiatric diagnosis.

Sex

Perhaps in contrast to Rosen et al. (2005), Pesci (2000) found that higher levels of vicarious exposure to the Oklahoma City bombing were associated with higher reported levels of distress and symptoms of PTSD. However, another subgroup came into the foreground as possessing an even greater potential for symptoms: Children and adult females were more likely to report internalizing and externalizing symptoms of distress compared to adult males.

Age

Not surprisingly, the subgroups of children and adolescents are at greater risk for the effects of traumatization compared to adults. The reasons for this can be attributed to cognitive and emotional development, such as the development

of coping mechanisms. Trauma-related stress reactions are more likely among children and adolescents whose coping mechanisms and cognitive and affective development have yet to prepare them to withstand the psychological pressures of traumatic victimization (Clark & Miller, 1998; Finkelhor & Kendall-Tackett, 1997). Additionally, children and adolescents often do not have the cognitive and verbal abilities to express the affect attached to witnessing or experiencing traumatic events (Yule, Perrin, & Smith, 2001). Therefore, children and adolescents tend to perceive traumatic events idiosyncratically (Urman, Funk, & Elliott, 2001) or 'child-specific' (Ahmad, Sofi, Sundelin-Wahlsten, & von Knorring, 2000, p. 240), thereby compounding psychological and emotional turmoil and setting the stage for such anxieties to be embedded, or comorbid, with other psychiatric disorders such as depression, somatization disorder, chemical abuse, or panic disorder (Bolton, O'Ryan, Udwin, Boyle, & Yule, 2000).

Conclusion

In 2013, the DSM-5 was published and includes a revised list of criteria for the diagnosis of PTSD, excluding vicarious exposure to media from the classification. This change reflects the APA's belief that vicarious exposure to media does not cause symptoms severe enough to yield the diagnosis of PTSD. However, even though mental health professionals can no longer technically diagnosis PTSD and ASD from vicarious exposure, children and adults alike may experience significant symptoms and distress from secondhand exposure to traumatic events. In fact, mental health professionals are acutely aware of the toll that vicarious exposure can take on the development and the exacerbation of symptoms in their clients. For mental health professionals interested in prevention, it would be helpful to know the threshold of hours of media viewing associated with the development of acute symptoms. Further, with the current lack of longitudinal research available on this topic, mental health professionals do not maintain an understanding of the duration of symptoms or the long-term impact of violent media exposure. Fallahi and Lesik (2009) concluded that following a traumatic event, it would be prudent to ask clients about their exposure to and viewing of high-profile media events as a routine part of any assessment.

More research is needed to be able to understand the effects of vicarious exposure to trauma. Much of the literature has traditionally focused on correlational and self-report data. Specifically, when participants are asked about their symptoms, they are self-reporting both their symptoms and the number of hours they have viewed high-profile cases, without objective corroboration. Fallahi and Lesik (2009) also point out that without a pretest measure of

PTSD, we are limited in our understanding of whether or not there is a causal inference that media exposure resulted in the development of ASD or PTSD symptoms. In addition, the majority of the literature on vicarious exposure has also centered around terrorist attacks and/or natural disasters. The literature examining mass shootings is sparse and arguably unique, leading members of the community to fear that their neighborhoods and communities may be at risk (Lawrence & Mueller, 2003). As we continue to study the effects of vicarious exposure to trauma in both children and adults, it will be crucial to develop guidelines for both psychological practitioners as well as those psychologists working to advise newscasters on the potential negative effects of violent media (Fallahi & Lesik, 2009).

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The Role of Technology in Expressions of Grief

Kenneth A. Lachlan

Mass shootings and other acts of purposeful large-scale destruction are increasingly capturing the attention of the general public. These graphic, visceral events inflict tremendous emotional and psychological damage on survivors, and on the family members and loved ones of the deceased. At the same time, media coverage of these events may be partially responsible for promoting emotional distress among onlookers both near and far, and continual consumption of news coverage related to such events may play a key role in psychological health (See Chapter 8).

This naturally leads to the examination of the role of technology in grieving and coping behaviors following mass shootings. The current chapter explores what is known about the role of both traditional media and new media technologies in managing grief and traumatic events. It begins by examining the literature concerning linear media, new media technologies, and traumatic events. It goes on to explore the role of interactive technologies in social support and online grieving, making an argument for their superiority as a mediated solution for grieving and the experience of loss without reliving post-traumatic stress disorder (PTSD)-inducing stimuli. Finally, it examines what is known specifically about mass shootings in terms of the effective use of new technologies in managing grief, and provides anticipated findings and suggestions for future research based on our knowledge of other literatures.

Stress, Dependencies, and Reliance on Media Technology

High-consequence events that induce grief and suffering, such as mass shootings and other purposeful mass casualty incidents, create a sense of uncertainty and unrest not typically associated with other patterns of media technology use. Weick (1995) and other scholars have identified this phenomenon as the “cosmology episode,” when the world has been cast into

uncertainty and individuals experience tremendous confusion and suffering. Following this shift, a fundamental compulsion exists to restore things to some type of rational order and closure. This drives a need to consume information and/or share information with others, in order to arrive at a less noxious state of mind. This basic drive to acquire and share information likely drives those affected to use different types of mediated technologies and the utility of these technologies in ratifying the cosmology episode leads to greater reliance upon them in the future for this purpose. It also forces us to critically examine the roles of both linear (i.e., television and radio) and interactive media technologies (e.g., social media such as Facebook and Twitter) in managing the psychological consequences associated with traumatic events, such as mass shootings. One useful theoretical framework for understanding these functions is the media dependency theory (Ball-Rokeach, 1973; Ball-Rokeach & DeFleur, 1976).

As a paradigm, media dependency theory (Ball-Rokeach, 1973; Ball-Rokeach & DeFleur, 1976) suggests that, in the absence of other resources, people are dependent on information acquired through technology to learn details, model behavior, and make sense of their surroundings. With limited access to a stress-inducing event, it is likely that mediated information sources are the primary source of information used in evaluating circumstances and deciding upon courses of action. In the event of a mass shooting this is likely to be the case, as those directly involved will have been evacuated from the scene, while those affected in a secondhand manner are unlikely to place themselves at the scene of the event. As people perceive a particular technology or outlet as functional and effective in solving problems, making decisions, or experiencing affective relief, they become increasingly dependent on that particular medium. Due to the perceived utility, that medium or outlet will subsequently exert additional persuasive power over them.

At the same time, there is likely to be great variability in media dependency based on the person and circumstance. Media dependencies may be heavily influenced by individual-level variables, such as personality, access to resources and locations, and degree of involvement in the event (DeFleur & Ball-Rokeach, 1989). For instance, those with a propensity toward information seeking may gravitate toward news outlets, as opposed to entertainment media. At the same time, audiences can only use the technologies to which they have access, and may not choose to seek information if the matter at hand is not perceived as relevant. Given that mass shootings tend to be perceived as events that involve dire consequences, and that those concerned will not likely have direct access to the scene, it is important to assess the roles of different technologically mediated solutions in the grief and suffering experienced after mass shootings, and to assess the extent to which audiences may rely on these technologies.

It is not difficult to see how these dependencies may play out in terms of high-risk events, such as mass shootings. Media dependency scholars, including Ball-Rokeach (1973), have argued that the perception that one has lost control over their surroundings, in the context of a high-consequence event, will produce especially strong motivation towards consuming information. Ambiguity will motivate those affected to become more dependent on technologically mediated information, and those impacted will be driven toward consuming information from sources they consider trustworthy and/or effective. It is likely the case that the affective needs and desire for grieving and closure associated with mass shootings will also be affected by media dependencies, and that those outlets found most effective in coping with grief and anxiety will be turned to again and again.

This assumption is not unlike the findings offered in the aftermath of other high-consequence events. Contemporary theorizing on uncertainty management and communication would posit that in the event of environmental risks that are of high probability and pose threats to life and property, people tend to seek out specific, technology-mediated information pertaining to the outcomes in question (Brashers et al., 2000). For decades, this body of research has offered more or less the same argument: that news media can be relied upon for the acquisition of information and for vicarious affect expression. This opportunity to experience affect and to identify with others allows the viewer to engage in coping and experience a reduction in the level of anxiety induced by the event (see Lachlan & Spence, 2014; Perse, Nathanson, & McLeod, 1996).

By the same token, this assumption is based on research that was conducted before the advent of social media. It is unclear whether these previously demonstrated results would apply to social media because this technology provides two-directional opportunities for the sharing of information and for giving and receiving social support. It may be the case that the grieving and vicarious affective responses associated with social media more closely resemble real-life social support. It is apparent that future research should compare the effectiveness of linear and interactive media in the processes of social support and grief since these mediated interactions may more closely resemble interpersonal ones.

Compounding this need for investigation is the high-stress nature of mass shootings and similar events. Under conditions of extreme duress and trauma it may be the case that these dependencies form very quickly. Those either directly or indirectly affected by such events may make fast decisions concerning the technological solutions they use in the management of grief and trauma, and will likely stick to those outlets and resources as the crisis unfolds. It is also likely that the medium through which they were first alerted of the event will continue to play a strong role in how all subsequent information is evaluated (Lachlan, 2013).

Media Use and Trauma: Vicarious Grief and Deleterious Effects

As suggested above, media dependency theory and the need to reduce uncertainty may drive audiences to seek mediated information in order to cope with their grief. At the same time, there may be deleterious effects associated with these patterns of media consumption. The following section provides an overview of what is known about the relationship between using traditional media to cope with high-stress situations, and its subsequent impact on emotional functioning and stress reactions. The extant literature is somewhat mixed in terms of the functionality of linear media in expressing grief vicariously and engaging in coping behaviors.

Some empirical evidence supports the notion that traditional media consumption may lead people to effectively cope with grief and tragedy. Following the September 11 terrorist attacks, for example, one study found that the most common means of coping was following the news through television and radio, and that the most effective means of coping in the immediate aftermath was the obtainment of information (DeRoma et al., 2003). This makes sense, given that seeing and hearing the accounts of others who are experiencing grief or trauma following a large-scale event may help individuals make sense of confusing and upsetting situations (Weick, 1995). Further, under these circumstances, formal leaders and others who are seen as credible and of goodwill can help the public to understand how to interpret and cope with the event and with the information that is presented (Seeger, Venette, Ulmer, & Sellnow, 2002; Spence et al., 2005).

Despite these few studies demonstrating support for the utility of media following traumatic events, the research on linear media as a coping mechanism in the aftermath of tragedy overwhelmingly suggests compound, negative effects associated with increased media exposure. While this research is not directly centered on mass shootings, these studies have implications for our understanding of the problems associated with the use of linear media in grieving and coping with traumatic loss. Numerous studies, for example, have offered data positing that children viewing coverage of the Oklahoma City bombings and September 11 terrorist attacks were more likely to develop depression and anxiety symptoms than those who did not view this information (Green, 1991; Hoven et al., 2004; Saylor, Cowart, Lipovsky, Jackson, & Finch, 2003; Terr et al., 1999). These studies included samples of children living near New York City following September 11 (Hoven et al., 2004) and samples of children living far from the city, suggesting that these disruptive patterns may be evident in those impacted both directly and indirectly by the tragedy (Saylor et al., 2003).

Similar findings have been found in adult samples, leading numerous researchers to claim that television coverage of highly tragic events may in and

of itself constitute a type of exposure to trauma (Ahern, Galea, Resnick, & Vlahov, 2004). Adults who reported viewing more television images of the September 11 terrorist attacks were more likely to report PTSD symptoms 4 months after the attack (Ahern et al., 2004). Ahern et al. (2002) offered additional data that supported heightened depression symptoms among those exposed to high levels of news coverage of terror activity. All in all, these findings suggest that media exposure to a terrifying event, such as a mass shooting, can lead to negative emotional responses, even among those not directly involved (Galea et al., 2003; Liverant, Hofmann, & Litz, 2004). These responses have also manifested in the form of behavioral outcomes (e.g., use of alcohol, cigarettes, and marijuana) that have been associated with PTSD symptomology following large-scale tragedies (Vlahov et al., 2002).

The capacity for mediated communication to induce or magnify PTSD symptoms is particularly alarming when coupled with the expected symptoms that accompany the experience – vicariously or otherwise – of a mass shooting. Numerous studies have found that individuals involved in mass shooting incidents are at risk of PTSD (see Norris, 2007; Orcutt, Miron, & Sligowski, 2014). For example, following the 2007 Virginia Tech shooting, Hughes and colleagues (2011) reported that over 15% of students indicated some degree of PTSD symptoms 3 months later; among those most strongly affected by the shooting, a reduction in self-efficacy and skewed perception of the frequency of such events were identified as contributing factors to this distress. Scarpa and colleagues (2014) offer more evidence of PTSD symptoms among Virginia Tech students, faculty, and alumni. In their study of the impact of mediated interpersonal exchanges, it was found that medium of transmission was relatively unimportant, but the nature of the information exchanged was; “conveyance,” or the sharing of factual information through electronic media, was positively related to subsequent PTSD symptoms.

Furthermore, public media involvement may serve to exacerbate these PTSD symptoms (See Chapter 10). Following a school shooting in Jokela, Finland, students who had given firsthand reports to media were more likely to experience greater PTSD symptoms at a later date than those who had not recounted the story (Haravuori, Suomalainen, Berg, Kiviruusu, & Marttunen, 2011). In this same study, the authors also found evidence of a double-dose effect – students who survived the shooting reported greater levels of PTSD after reliving the experience through repeated exposure to media coverage of the event. It may also be the case that specific patterns of information processing and coping tendencies play a role in how mediated information concerning a mass shooting contributes to the proliferation of ongoing psychological distress and difficulties. For example, Nolen-Hoeksema (2000) and others have argued that some individuals are prone to think repetitively about experiences they perceive as traumatic, emotionally arousing, or difficult to understand. As a result, individuals predisposed to this maladaptive coping style may focus the majority of their attention

on reliving the negative emotions and consequences of an event, as opposed to seeking solutions to the disturbance in question. Those inclined to ruminate may then be more likely to experience long-term psychological or emotional distress associated with the tragedy, and this may lead to acute, diagnosable depressive disorders (Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema, Parker, & Larson, 1994).

The research on coping and its relationship with mediated information concerning tragedy also reveals stark gender differences that are worth considering. This research largely suggests that women are more likely than men to engage in rumination when dealing with information that is traumatic or emotionally distressing (Nolen-Hoeksema & Girgus, 1994; Nolen-Hoeksema, Larson, & Grayson, 1999). Mak, Hu, Zhang, Xiao, and Lee (2009) add further evidence of gender differences in individuals' responses to upsetting information by examining neural activity in men and women who were exposed to highly positive, negative, and neutral images. The results suggested that imagery evoking negative emotions were more likely to drive women toward affective and emotion-focused strategies to reduce negative emotions, while males exposed to the same stimuli were more likely to use cognitive strategies. This is consistent with past research suggesting that men and women may differ in their responses to unpleasant stimuli and that there may be underlying differences between the sexes in terms of their propensity towards emotional recall and affective processing (see Cahill, 2006; Collignon et al., 2010; Seavey, Katz, & Zalk, 1975). In all, this suggests that the use of linear media as a means of coping with grief may be especially problematic for women, as the imagery presented may have greater capacity to induce ruminative thought patterns that contribute to PTSD and other stress-related disorders.

Social Media as an Alternative to Vicarious Grieving

Another key concern with the use of linear media as a method of vicarious grieving is its propensity toward isolating those in need. Regardless of the source, past research has supported that social support plays an important role in managing grief and dealing with trauma. A significant body of research suggests that social support from peers, caregivers, and those perceived to be similar to oneself can be effective in reducing psychological distress associated with traumatic events (Bonanno, Brewin, Kaniasty, & La Greca, 2010; Masten & Obradovic, 2008; Paul et al., 2015). Across this literature, social support has been demonstrated to be an effective tool in the reduction of grief and PTSD symptoms (Ellis, Nixon, & Williamson, 2009; La Greca, Silverman, Lai, & Jacard, 2010). At the same time, deficiencies in these social support mechanisms have been connected to increased psychological distress (Burton, Stice, & Seeley, 2004).

Given the problems associated with the use of traditional linear media (e.g., reliving the event), it is beneficial that there are other technologically mediated outlets for dealing with grief. Recent advances in interactive media allow for connections and interactions that more closely resemble face-to-face social support. Although seeking to make sense of mass shootings through the processing of linear media may contribute to greater psychological distress, there are emerging technological solutions that have been found to be effective in managing stress and grief by more closely mirroring interpersonal social support.

While there is extensive research in the communication and psychology literatures on the use of new media technologies for social support, scant research has specifically examined the intersection of online social support, interactive media technologies, and grieving. While these studies were not designed specifically to examine grief in the aftermath of a mass shooting, they offer valuable insight into the types of uses and responses we might expect under the circumstances. Walter, Hourizi, Moncur, and Pitsillides (2011) offer numerous arguments concerning cultural changes that impact the importance of news media and social media technologies in the mourning and grieving process. Among these, they argue that in recent years grieving and mourning in the Western world has shifted toward a model involving the celebration of the lives of the deceased individual. In this model, social media sites like Facebook offer the bereaved a chance to relive the life and experiences of the deceased, along with any shared experiences they may have had with the individual. In terms of face-to-face memorializing, the authors note that social media can also be used to coordinate these more traditional mourning and celebration rituals, or serve as an outlet for streaming the event, thus breaking down geographical barriers regarding attendance (Pitsillides, Katsikides, & Conreen, 2009).

Another important consideration offered by Walter and colleagues (2011) concerns the distinction between grief-specific and non-grief-specific websites in memorializing the deceased. Since the mid-1990s, text-based memorial sites have been available that allow individuals to express grief and mourn the departed. These sites often revolve around those who have been lost to a particular ailment or condition, such as cancer, AIDS, or substance abuse. Those participating in the community therefore begin with some degree of commonality, and it is widely accepted that one may mourn someone they did not know if they feel this sense of connectedness.

However, interactions also occur on websites (e.g., social media) that were not specifically designed with mourning in mind. Social media sites allow individuals who may not have previously known each other to share experiences and impressions of the deceased. This leads to the formation of relationships despite having no previous commonality except their knowledge of the person they are grieving. Walter and colleagues (2011) argue that these relationships are typically short-lived, given that they constitute “weak ties” (see Granovetter, 1973) and are situationally construed.

At the same time, the notion of the “weak tie” through social media has come under increased scrutiny in recent years. Recent research has indicated that bonds and relationships formed through social media may be every bit as meaningful and influential as those formed through face-to-face interactions, and research evidence suggests that this may be especially true in instances in which bonding involves the overcoming of emotional or psychological obstacles (see Ledbetter et al., 2011). It stands to reason, that in the context of mass shootings, the spontaneously formed social networks designed to grieve the deceased may develop into more stable, long-term communities dedicated to making sense of the loss and preventing similar incidents in the future.

Given the potential for people to form strong and meaningful social bonds through social media, the underlying psychological processes behind their use become an important consideration in our understanding of their utility in managing grief following mass shootings. Carroll and Landry (2010) offer important insights into our understanding of grief and bereavement and its connection to social media. They argue that, at least in contemporary American society, the goal of bereavement appears to be to create a sense of normalcy and a return to everyday life as quickly as possible. In this context, online social support and grief, such as those driven by Facebook and social media, become an important resource for those experiencing a tragedy, given that the mediums have the capability to memorialize the deceased quickly and across temporal and geographic separation. In this sense, social media sites allow the bereaved to construct a biography of the deceased using timelines and photographs, and both memorialize and celebrate the importance of that individual in their lives (Walter, 2006). It is also noteworthy that these practices are not dissimilar to grieving rituals practiced in other non-western cultures; writing on the Facebook or Myspace wall of a deceased person may facilitate grieving in a similar manner to behavioral gestures commonplace in the everyday lives of those grieving in African or Asian cultures, such as an extra place setting at the dinner table (Debatty, 2007).

In their ethnographic exploration of roughly 200 postings on the Myspace walls of deceased individuals, Carroll and Landry (2010) reported five common themes. First and most common is that of an overt expression of grief; nearly half of the posts they identified contained some expression of missing the individual, mourning their loss, or wishing that they rest in peace. Perhaps more interesting from a psychological perspective are the other themes that emerged. Myspace users were also likely to use the medium to express praise or admiration for the deceased individuals, often in the form of expressions of appreciation for those they impacted. Related to this is an acknowledgment of expertise; the authors also found that users would post requests for advice and guidance on the walls of the deceased, both as a request for help and as a tacit acknowledgment of the expertise and guidance the individual provided while they were alive. Other common themes included biographic or narrative

accounts of shared experiences, and statements regarding the values for which the deceased individuals stood. All in all, the data provide a picture of the content that individuals post on the walls of the deceased, and provide a glimpse into how these individuals grieved. Well beyond simple expressions of grief and bereavement, the content reveals the ongoing psychological presence of the deceased in the minds of those choosing to post on their walls, and to some extent the utility of social media in facilitating grieving.

Arthur (2009) and others also note the importance of storytelling as a means of commemoration and grief following tragedies of significant scale. Numerous scholars have argued that the telling, listening, and sharing of commonly held experiences are basic components of the healing process. Arthur (2009) argues that commemoration through social media is not so much a form of collective memory, as it does not engender a uniform remembrance of the tragedy in question. Rather, it can be better categorized as a place of *collected memory*, a place where people can create a repository of pictures, stories, and shared experiences that individual mourners may pick and choose from in satisfying their needs for grieving and closure. These types of online commemorations, such as those associated with the September 11 terrorist attacks and natural disasters, can serve to solidify and even create new communities of those affected by the same tragedy (Hess, 2007; Recuber, 2012).

Such online repositories of information that users can tailor to their specific needs may be instrumental in the grieving process. One example of the use of new media technologies for grieving, social support, and collected memory in the specific context of a mass shooting can be found in the aftermath of the 2007 Virginia Tech shooting. Mastrodicasa (2008) reported that, in the aftermath of the shooting, more than 500 individual Facebook groups were created related to the shooting. These included tributes, social support groups, groups dedicated to discussion of gun control and mental health issues, general information concerning the event, and others. More specifically, the Facebook group "VT Unite," a forum dedicated to providing social support to grieving students, gained over 50 members within 24 hours of the shooting (Mastrodicasa, 2008; Read, 2007). As a matter of policy, Facebook froze the accounts of those who perished in the Virginia Tech shooting until they were contacted by a loved one or next of kin; after reopening the account, friends and loved ones reported finding comfort in visiting the pages and photo albums of those who had lost their lives in the shooting (Hortobagyi, 2007).

It should also be noted that traditional blogging sites, which were still popular in the late 2000s, played an important role in managing grief online following the Virginia Tech shooting; numerous student affairs organizations used these online web journals to field questions and inquiries regarding support for students, as well as an exchange of ideas about the management of student issues should a similar shooting take place on their campus. Palen and colleagues (2010) argued that in a broader sense, the Virginia Tech shooting marked the dawn of

the use of both traditional blogging and microblog services (e.g., Twitter) in the management of crises and disasters. They offer that, related to the grieving process, individuals need to engage in sense making following a tragedy of such magnitude. They also note that during the Northern Illinois University shooting several years later, students and other members of the campus community once again returned to these blogging resources, though with an apparent degree of increased caution and sensitivity given users' greater awareness of the public, masspersonal nature of these interactions (Palen & Vieweg, 2008).

Masspersonal Communication and Dialogue

This leads to the consideration of another manner in which social media may be valuable as a technologically mediated technique for dealing with grief – the notion of “masspersonal” communication. In a short time, social media platforms, such as Facebook and Twitter, have emerged as central resources in making sense of the world. These platforms not only allow individual users to engage in direct dialogues with each other, but enable them to broadcast these interactions to a larger follower group. These conversations can be retrieved or viewed by others anonymously, or indexed using particular hashtags or keyword searches. As such, one can instantly find and trace dialogue between other users that are perceived as similar in some way.

Extended to the role of social media in expressions of grief and tragedy, it is easy to see how the observation of the dialogue of others may be beneficial to those suffering loss. The notion of “masspersonal” communication has been used to describe the blurring of lines between interpersonal and mediated communication (O'Reilly & Battelle, 2009; Westerman, Spence, & Van Der Heide, 2012), and scholars have offered that the illusion of dialogues or the perception of dialogue between others may be of some comfort to those experiencing stressful circumstances. Given that people may be drawn to media (whether linear or interactive) for affective needs, it may be the case that the observation of dialogue between others experiencing grief can, by itself, prove therapeutic and provide some sense of closure. On social media platforms, individual users can choose their own level of involvement; one does not necessarily need to become involved in the conversation if they are not comfortable doing so, or they can choose to gradually open up and disclose at a pace they find comfortable given the psychological stress they are experiencing. At the same time, the observation of others may help those experiencing grief feel as though they are not alone, and this itself may aid in the grieving process. This capability of social media for “masspersonal” information sharing allows social media users to both consume and create content, and may help lead to shared understanding among those both participating in and observing the dialogue in question (Lachlan, Spence, Lin, & Del Greco, 2014).

Regardless of the level of involvement chosen by the user, research evidence indicates that social media is becoming an increasingly important resource for mourning and for experiencing emotionally distressing events. Over six decades of research on the uses and gratifications of electronic media indicates that mediated technologies, coupled with interpersonal interactions, are critical resources for individuals experiencing crises (Bracken, Jeffres, Neuendorf, Kopfman, & Moulla, 2005; Deutschman & Danielson, 1960; Greenberg, 1964; Spitzer & Spitzer, 1965).

Among social media platforms, Twitter in particular has emerged as a timely and important resource for the management of large-scale crises (Armstrong & Gao, 2010; Sutton, Palen, & Shklovski, 2008; Westerman et al., 2014). Numerous studies have suggested that the capacity for Twitter to provide real-time updates and continual coverage of events like mass shootings, as they unfold, is perceived as a key advantage that the medium presents for those trying to make sense of highly uncertain and traumatic circumstances. Further, emergency management agencies are beginning to recognize the utility of the medium in addressing the emotional and psychological concerns of those affected by mass crises and disasters (Kavanaugh et al., 2011). This utility is magnified by the capacity of the medium to provide updates in almost real time, given a perception that traditional media outlets do not provide updates fast enough during developing situations that may be highly equivocal (Sutton et al., 2008).

Twitter's ability to offer fast, continual updates to those experiencing psychological distress stems from the formal features of the medium. Twitter can be used to link to URLs and other web resources, and the character limits of the medium may be less restrictive than is often assumed; while tweets are limited to 140 characters, it is easy to link to more detailed accounts of an incident. In terms of what Tweets are likely to be retweeted and contribute to a broader sense of community among those affected by tragedy, several studies offer data positing that a tweet is more likely to receive "serial transmission" if it contains a URL, as this heuristic is relied upon by users under trying circumstances to identify information that is more complete or more relevant to the issue at hand (Suh, Hong, Pirolli, & Chi, 2010). Further research posits that the very circumstances surrounding crisis and tragedy may contribute to the likelihood of serial transmission, as these circumstances produce a degree of motivation not found under conventional tweeting circumstances (Hughes & Palen, 2009). In sum, under circumstances of extreme duress, Twitter may emerge as a supplement to linear media, and the advantages offered by Twitter are those concerning first alerts, affective support, and engendering a sense of community among users, while linear media are more likely to be relied upon for informational updates, instructions, data, and behavioral recommendations (Jin & Liu, 2010; Lachlan et al., 2014; Liu, Jin, & Austin, 2013; Palen et al., 2010).

While little is known specifically about the role of social media in the management of grief following mass shootings, it is not difficult to extrapolate

from the extant research on social media and social support. It is likely the case that new media technologies have the potential to provide a stable, interactive environment for the expression of grief. The findings from the literature on online social support would suggest that small, closed online communities have the capacity for offering social support that is every bit as effective as, if not more effective than, face-to-face support groups.

Conclusions

Evidence from a long history of research in the fields of communication and psychology points to the use of media technologies in grieving and in managing real-life events that induce suffering, confusion, and ambiguity. While much of this research has focused on natural disasters, it is not difficult to see how much of what has been learned from these studies informs our understanding of mass shootings. Further, a small number of studies specifically examining mass shootings shed light on these underlying processes.

We can be fairly certain that those affected by tragedies like mass shootings will have a strong desire to obtain information, both in order to make sense of highly equivocal circumstances and to mourn the loss of others as the details surrounding the incident come to light. Social media and commemorative websites may allow those adversely affected to experience grief, share experiences, and to storytell in a manner that allows them to find closure and move forward without necessarily reliving the trauma in question. Social media may also be effective in creating a sense of community, and in galvanizing those who share a collective sense of suffering as a result of the shooting. Future research should attempt to apply these expectations specifically to the context of media use and effects following mass shootings, in order to verify their plausibility in this specific, applied context. It may also be beneficial to investigate the possibility of negative effects associated with the use of social media under these circumstances. While most of the extant research has examined social media and its role in providing social support during crises, we should not consider it a panacea, and future research should examine whether or not the negative consequences associated with linear media use and rumination play out in the context of social media.

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The Impact of Journalism on Grieving Communities

Henna Haravuori, Noora Berg, and Mauri Marttunen

The roles of journalists and news media institutions are complex during and after accidents and disasters (Newman & Shapiro, 2014). One of the obligations of journalists and photographers is to witness and report about events that are of interest to a large number of people. Although reporters may be among the first ones on the scene, their role is different from rescue personnel. At times this may be confusing to survivors and professionals working at the scene, as well as to the journalists themselves (Englund, Forsberg, & Saveman, 2014; Newman & Shapiro, 2014). News reports can be essential in communicating necessary information to local communities about how to promote safety and can initiate the mobilization of necessary resources (Newman & Shapiro, 2014). Later the media coverage becomes more versatile and the media have a role in selecting what and how information is presented to the general population. Further, journalists have their own guiding principles and work ethics. Privacy and confidentiality are highly valued principles to both journalists and health care professionals, but journalists also have to balance the public's right and desire to know details about events (Newman & Shapiro, 2014).

Following crises, such as mass shootings, the media adopt an approach called the *crisis mode of communication* (Sumiala & Hakala, 2010). Media organizations shift into full alert as scheduled programs are cancelled and all their energy is geared towards covering the one subject. Television has been the central medium of communication for decades until more recently, as the Internet has gained a crucial role with both professional and amateur-produced news, and social media applications (Sumiala & Hakala, 2010).

When Kay, Reilly, Connolly, and Cohen (2010) studied news coverage in a small community after a homicide, they found the following and potentially harmful key themes about how the media impacted the grieving community: alienation from the community, anger at the media's public construction of the

community, intrusion on community life, intrusion on the private processes of grief, and the triggering of renewed feelings of loss and grief. Media presence and coverage is expected by some survivors, and therefore they may not react to it in either a positive or negative way (Englund et al., 2014). On the other hand, there have been several situations where the presence of journalists at crisis sites and the subsequent news broadcasts were regarded as highly disturbing. In the present chapter, we will discuss the roles of the media and the field of journalism in recovery after traumatic events, in general and through particular examples of mass shootings.

Mediatizing or Stigmatizing?

Throughout the history of mass shootings, the media and the field of journalism have gone through tremendous changes, which are still continuing to evolve. In the 1960s, the University of Texas tower sniper attack was conveyed to the public through traditional communication channels, such as television, radio, and print media (Shultz, Muschert, Dingwall, & Cohen, 2013). In 1999, when the Columbine High School shooting occurred, the Internet was starting to gain more users, but news content was still mainly produced and spread by professional journalists. When the Jokela High School and Kauhajoki School shootings occurred in 2007 and 2008, respectively, the Internet was more widely used as a source for news but social media applications were just starting to gain popularity in the field of communications. By the time the Sandy Hook Elementary School shooting happened in 2012, social media had established its pivotal role as a primary form of communication. This change has meant that information is not merely conveyed from the top downward (i.e., from journalists to citizens), but also that anyone can create, distribute, and share news.

The media have an undeniable impact on social and cultural life (Sumiala & Hakala, 2010). Krotz (2009) has defined mediatization as “a historical, ongoing, long-term process in which more and more media emerge and are institutionalized ... the process whereby communication refers to media and uses media so that media in the long run increasingly become relevant for the social construction of everyday life, society and culture as a whole” (p. 24). Media extend the natural limits of human communication, provide a substitution for social activities and social institutions, blend in with different nonmedia activities in social life, and operators and organizations from the different sectors of society accommodate to the media logic (Hakala, 2012; Sumiala & Hakala, 2010). For example, parents and students repeatedly talked about the media when asked about the social consequences of the Columbine High School shooting (Hawkins, McIntosh, Silver, & Holman, 2007). Media provide a unique way to experience crises and disasters, including involvement in

activities such as mourning and grief, and can help activate recovery and resilience (see Chapter 9 for more on the role of technology in grief).

Following mass shootings, the victims are categorized in the media as deceased victims, injured victims, eyewitnesses, the bereaved, and mediated victims (Hakala, 2012). Injured victims that have minor or no physical traumas are usually targeted by journalists as firsthand sources of information while they are not of high priority in first-aid triage (Hakala, 2012). In the mediatization of victims, there is a great need for personalized stories. Journalists seek survival stories that provide clues for understanding and explaining the event (i.e., meaning making; Hakala, 2012). Mediatization of the crisis helps those not directly affected (i.e., outsiders) to understand the incident and participate in collective mourning (Sumiala & Hakala, 2010). There may be social media or Internet communities for grieving and memorializing the victims (see Chapter 9). Although this process certainly has an important role (e.g., expressing grief, communicating information), it also results in the loss of the victims' privacy.

After the Jokela High School shooting, the media coverage of the incident was very distressing for the surviving students because the media tried to blend into the students' nonmedia activities (Hakala, 2012). Their private emotions of shock, fear, sorrow, distress, and grief were invaded and exploited without invitation or permission (Raittila, Koljonen, & Väliaverronen, 2010). Victims' stories were publicized in the media (Hakala, 2012). In addition to this example, there are several mass shooting cases where journalists and the continuous news flow sensationalized the grief in ways that even the involved individuals could not identify with (Hawkins et al., 2007; Jemphrey & Berrington, 2000).

Survivors' stories are shared in the mediatized world. But, how does it impact survivors themselves? One hypothesis is that news coverage retraumatizes survivors and impedes recovery. The opposing hypothesis is that news reports provide social recognition for survivors and are one form of positive support that may aid in recovery (Maercker & Mehr, 2006). Additionally, the public's perceptions of the survivors may be influenced by the picture that the media paint. Survivors may be portrayed as heroes or become stigmatized as vulnerable people, both potentially harming the survivor's sense of self (Libow, 1992). Perceived social acknowledgment is the survivor's experience of reactions from society, and can be distinguished as general positive acknowledgment (recognition), general negative acknowledgment (disapproval), and familial recognition/disapproval (Maercker & Mehr, 2006). Negative aspects of social acknowledgment have been found to increase posttraumatic stress symptoms (PTSS) among crime victims, at least in the short term (Maercker & Mehr, 2006). In addition, crime victims' reactions have been found to be significantly more negative (e.g., feelings of exposure and anger) when the content of the report is inaccurate. Maercker and Mehr (2006) concluded that individuals with lower psychological wellbeing may be retraumatized to a certain extent when they become the focus of the news coverage.

Mediatized Grief

While loss and grief are essential parts of human life, the grief work that is assumed to be required for recovery is not a clear concept (Bonanno & Kaltman, 1999). There have been theoretical models for *stages* and *phases of grief*, and a notion for a need to “work through” grief. However, there is little empirical support for this concept (Bonanno & Kaltman, 1999; Falconer, Sachsenweger, Gibson, & Norman, 2011). Bonanno and Kaltman (1999) suggested that models of grief and bereavement could be based on the theories of cognitive stress, attachment, social-functional approach to emotion, and trauma. They concluded that bereavement consists of four interacting components: the context of the loss, the continuum of subjective meanings associated with the loss, the changing representations of the lost relationship over time, and the role of coping and emotion-regulation processes. The meaning of a loss and the meaning-making process have quite different nuances after a traumatic event (Bonanno & Kaltman, 1999).

Grief is not only an intrapersonal experience, but also a broader phenomenon that impacts families, friends, and communities (see Chapter 12 for more on the impact on communities). Throughout history, societies and cultures have had a variety of customs and rituals that foster grief (Falconer et al., 2011; Sacre, 2013). The media, media culture, and new digital means of social interactions have changed the mourning rituals (Pantti & Sumiala, 2009). The roles of the media are complex: The media not only observe and report on these rituals but affect how the ritual is performed and experienced, how it is interpreted by the public, and how public reactions and emotions are managed (Pantti & Sumiala, 2009). Rituals performed through the media may promote a community’s sense of social cohesion and shared values, while as a downside may exacerbate divisions between conflicting groups within a community (Pantti & Sumiala, 2009). What is emphasized and framed has an impact on not only individual-level but also community-level meaning making of the event, what should be remembered or dealt with as a collective trauma, and whether there is an obligation to forgive (Margalit, 2002).

Framing

Framing refers to the ways individuals, groups, and societies communicate and make social constructions about reality (Goffman, 1974). Said another way, framing is the process of making interpretations about social phenomena. Journalists frame news by selection, emphasis, exclusion, and elaboration of information (Muschert, 2009). Previously drawn frames define future frames and can even influence the course of events. In mass shooting incidents, the media do not merely report facts but actively take part in framing the event

(Ryan & Hawdon, 2008). Mass shootings attract the media's attention widely and some studies have examined the media's role in determining the discourse and perceptions of the event (see Chapter 7 for more on how media influence public beliefs). Through various processes some frames become more widely recognized than others and eventually a dominant frame is formed. It becomes the community's collective understanding of the tragedy (Hawdon, Oksanen, & Räsänen, 2012).

Studies have found that the media change the frames over time when covering mass shootings. For example, in the aftermath of the Columbine High School shooting, the published news was first framed to concentrate on what happened, and then widened to cover societal issues, such as gun laws and afterschool care (Chyi & McCombs, 2004; Muschert, 2009).

It has been very common in the American media to focus on the victims' lives. Meanwhile, some victims are more interesting than others to the media. In school shooting incidents, the focus has often been on heroic educators and innocent children (Schildkraut & Muschert, 2014). The media's framing process also depends on cultural factors. For example, the victim focus is rare in Finland and instead the news tends to focus on the perpetrators (Hawdon, Oksanen, & Räsänen, 2012).

The Role of Social Solidarity and How Journalism Affects It

Community can be understood as a multidimensional concept that includes dimensions of space, sentiment, and social structure (Campbell, 2000). Space refers to the geographic location and infrastructure of the community. Sentiment is the psychological attachment and emotional bond the members have with their community. Social structure refers to the social networks within the community (Hawdon & Ryan, 2011). An unexpected crime, such as a mass shooting, might affect all of these aspects of a community (see Chapter 12).

The unity of a community can be measured through levels of social solidarity, which can be defined in many ways and is sometimes referred to as social integration or cohesion. It can be seen as an umbrella term for positive interactions with others (Sorokin, 1947, 1954), feelings of togetherness, responsibility for others (Wilde, 2007), mutual social support, and sense of community (Nurmi, Räsänen, & Oksanen, 2011). Social solidarity can be manifested through several actions, such as providing help, willingness to discuss and express affect, and participation in public events. When an unexpected and violent crime occurs in a community, its social solidarity is tested. This is important because perceived social solidarity is associated with less distress after tragic events (Hawdon, Räsänen, Oksanen, & Ryan, 2012). This is no surprise since the association between social relations and wellbeing is widely recognized (House, Landis, & Umberson, 1988). It has been argued that people with

fewer social contacts suffer from poorer mental health while larger social networks and stronger social relations are associated with better mental health (Fuhrer, Stansfeld, Chemali, & Shipley, 1999).

Two opposing arguments have been suggested about a violent crime's impact on a community's sense of solidarity. Several studies have suggested that social solidarity increases in a community after a tragedy, particularly right after the incident (Hawdon, Räsänen, et al., 2012). This perception was introduced by Émile Durkheim at the end of the nineteenth century (Durkheim, 1893/1997) and many contemporary studies have reached similar conclusions when examining mass shootings. The frame of solidarity is promoted when the media concentrate on reporting about community acts, information on the victims, and use community members as informants (Hawdon, Oksanen, & Räsänen, 2012). Other studies have suggested that a violent crime weakens the community's integration and sense of solidarity, and increases fear of crime and distrust among the community members (Lewis & Salem, 1986). For example, the news of a mass shooting might increase insecurity in the community since the media might enhance fears of the event reoccurring (Vuori, 2016).

Studies on mass shootings have observed indications of both increases and decreases in solidarity. In the case of the Virginia Tech shooting, solidarity first increased by 18% and slowly decreased after 6 months but never returned to the initial level (Hawdon, Ryan, & Agnich, 2010). In Finland, comparison of the incidents in Jokela and Kauhajoki revealed differences between the two communities (Nurmi et al., 2011). Jokela resembled Virginia Tech with numerous expressions of solidarity after the incident. However, this increase in solidarity might not have occurred if the event had not been seen as affecting the community collectively (Ryan & Hawdon, 2008). This was the case in Kauhajoki, where expressions of solidarity were not seen since the community did not define the attack as targeting them collectively because the victims and perpetrator were not originally from the community (Hawdon, Oksanen, & Räsänen, 2012).

Increased solidarity might be harmful if, as a result, some groups are left out (Nurmi et al., 2011). In the cases of Virginia Tech and Jokela, social solidarity was perceived as a protective factor. But, in Jokela, increased solidarity eventually led to conflict and social guilt (Hawdon, Oksanen, & Räsänen, 2012; Hawdon, Räsänen, et al., 2012). A tragic event can cause polarization in many ways. Those who have been directly exposed to the event might feel that those who were not directly impacted do not understand how they feel. Previous studies have suggested that perceived social solidarity does not increase among the severely exposed in the same way that it does among other members of the community (Hawdon & Ryan, 2011; Vuori, 2016). For example, polarization occurred between the youths and adults in Jokela (Nurmi et al., 2011). The media can cement these barriers between groups by framing controversies between them. Spencer and Muschert (2009) reported on a controversy framed

by the media following the Columbine shooting. The news covered the creation of spontaneous memorials in Columbine, especially 15 wooden crosses that were put up for the deceased, including the perpetrators. Spencer and Muschert (2009) described how the media framed a controversy around the two crosses for the perpetrators and established opposing opinions regarding the positioning of memorials for the perpetrators among the victims. Current evidence suggests that forces of social integration and disintegration might occur simultaneously in a community after a tragedy (Vuori, 2016).

One of the themes in the media is often the question of “who is to blame?” It has been recognized that based on the social causes perspective, communities tend to be blamed for mass shootings because they failed to see signs beforehand (Schildkraut & Muschert, 2013). For example, school subculture was heavily blamed after the Columbine High School shooting, although this occurred in the absence of a factual basis (Schildkraut & Muschert, 2013). Towns or communities may become synonymous with the mass shooting event that happened there. Whole communities and its members then have to work hard to maintain their true identities and not to let the tragic event define who they are or should be (Sacre, 2013).

Media Invading Community

There are several key media actions and journalist behaviors after mass shootings that should be highlighted. One of them is the speed of media production. Journalists arrive at the scene quickly and start to publish about the events while the facts are still unraveling. There are examples where the media rushed into communities while the mass shooting incident was still unresolved, and police and rescue operations were ongoing (e.g., Columbine, Jokela). When there is high pressure to publish, the accuracy of the news stories lags behind. The second feature is the overwhelming number of media representatives, who often remain in the community for long periods of time (Hawkins et al., 2007; Jemphrey & Berrington, 2000; Kitch & Hume, 2007; Raittila et al., 2010; Walsh-Childers, Lewis, & Neely, 2008). Third, many of the journalists use indiscreet ways to collect information for their stories, although most journalists follow their ethical code and are sensitive to the victims’ needs. If authorities are slow in media reporting, the pressure to get stories from firsthand eye witnesses increases. Open conflict between journalists/media and the community may evolve.

After the school shooting in Dunblane, Scotland in 1996, there was an agreement among journalists to be discreet, not interview bereaved families immediately, and not cover funerals, which is atypical for the British press (Jemphrey & Berrington, 2000). However, most news reporters requested interviews later.

The Columbine High School shooting received worldwide media attention. The suburban town was filled with reporters and media equipment. The students and parents interviewed in the study by Hawkins et al. (2007) reported that the media actions were intrusive. Journalists knocked on doors and asked for interviews nonstop for almost two weeks. Furthermore, cameras followed grieving families to their homes. Photographing and filming the grieving and requests for interviews were relentless in places like the memorial for the victims. While in some cases, early news reports can help to piece together the details of the event and how to proceed, media intrusion is often perceived as harmful in the long term. This is especially true of inaccurate and exaggerated news content (Hawkins et al., 2007).

A documentary film by Moritz (2003) discussed how journalists, students, and community members viewed the news coverage of the Columbine incident. The conflict between the media and the community was long-lasting, while there were attempts to ease the tension (e.g., coordinating meetings with school officials and journalists). Even the journalists themselves found it difficult to do their job because of the presence of so many media personnel (i.e., the media circus). One perceptive narrative stated that the media personnel themselves became trauma triggers, reminding the traumatized and grieving community members of the event. The importance of accurate news reporting was stressed while recognized as hard to achieve due to the constant pressure to publish new content.

In a study by Walsh-Childers et al. (2008) it was concluded that journalists were a stressor for the survivors, family members, and community members following the 2007 Virginia Tech shooting. Unfortunately, the university located the media vehicles and equipment in the parking lot across from the inn on campus, where bereaved families were directed to go. It was impossible for the family members and students to avoid direct contact with the media. Three types of media actions were observed: journalists behaving badly, media mob, and journalists displaying compassion. Intrusive attempts to get interviews from injured students and families who had experienced a loss occurred frequently early on. The coverage was also perceived as negative and aggressive towards the school, as the media searched for someone to blame. Conversely, there were also notions of positive interactions with journalists. For example, many of them were sincerely concerned for interviewees' needs and did not aggressively push for interviews or live broadcasts (Walsh-Childers et al., 2008).

When the news broke about the Jokela High School shooting there were dozens of journalists on the scene within a half an hour, filming and photographing the escaping students and school workers. Phone calls and text messages were sent by some reporters to students who had been rescued or were still waiting to be rescued within the school building. The youths of Jokela reported intrusive attempts by journalists to obtain interviews and photographs, and students indicated it was particularly distressing when they were

photographed even after they asked journalists not to. The news broke first online, and then on television and in printed news. Interestingly, Internet communities identified the probable perpetrator while the police operation was still ongoing (Investigation Commission of the Jokela School Shooting, 2009; Raittila et al., 2008; Raittila et al., 2010).

The official information released by the authorities was lacking for a long time in the case of the Jokela shooting, so the reporters felt pressure to gather information from those directly involved. It was especially problematic when the journalists conducted interviews with minors without informing their parents. There was no preparation and no safeguards in place to protect the students. Instead, the students were in the same location near the school as the journalists (Investigation Commission of the Jokela School Shooting, 2009; Raittila et al., 2008; Raittila et al., 2010).

The youths of the Jokela community collected a petition questioning the actions of the media. The questions raised were whether it was appropriate behavior to follow people entering and leaving the Crisis Centre, to find out personal details about the perpetrator, victims, or their families, to secretly photograph or listen to grieving people, and to try to enter homes. The youths felt that their crisis and grief were not respected by the media. The conflict was so severe that there was open hostility toward journalists (Investigation Commission of the Jokela School Shooting, 2009).

The students expressed a desire for empathy from the journalists during interviews. "How are you feeling?" types of questions felt inappropriate and naïve in contrast to being asked about the facts in the immediate aftermath. After giving interviews many students reported that they regretted or felt shame about the interview, and that it took time away from their recovery. As a consequence of agreeing to give interviews, some adolescents were shunned by their peer groups. Yet, some of the young people recognized that the journalists were just doing their job (Raittila et al., 2008).

The Kauhajoki School shooting happened less than a year after the Jokela incident. However, the actions of the media and the news content were noticeably different from the Jokela incident. First, there had been ongoing discussions with members of the media about work standards and ethics. When reporters arrived at remote Kauhajoki, there was no access to the scene. Information by the authorities was given fast and was updated regularly. There was little emotive content in the news at first. In fact, reporters and photographers were criticized for being too discreet. However, more dramatic news content emerged as time elapsed. Journalists were reportedly less aggressive in Kauhajoki when seeking interviews. Yet some students reported constant knocking on their doors and receiving phone calls and text messages requesting interviews (Investigation Commission of the Kauhajoki Shooting, 2010; Raittila et al., 2010).

Coverage on victims was very sensitive or was avoided altogether after the Kauhajoki tragedy. It is customary that names of the victims are not published immediately in Finland after accidents. Finnish journalists mainly avoided contact with the bereaved families. However, a foreign tabloid newspaper reporter visited six mourning families. Unfortunately, several of these visits occurred before police had confirmed the death of the family member. This behavior was viewed as inappropriate by the Finnish journalists (Investigation Commission of the Kauhajoki School Shooting, 2010; Raittila et al., 2010).

Contact With Journalists and Survivors' PTSS

The impact of how victims and survivors are approached by journalists has been one of the main concerns in this area of the literature. The possibility of revictimization or exacerbation of traumatic reactions is recognized within the ethical and practical guidelines that have been developed for journalists covering catastrophes (e.g., Simpson, 2006; see www.dartcenter.org).

A traumatic event weakens our feelings of security and sense of control, and uncontrollable media intrusions may contribute to this sense of violation and lack of control (Libow, 1992; Wilms, 2007). The interviewee may be in shock and may not understand that they are giving an interview. Further, the interviewee does not have control over how the interview material is used afterwards.

The extent and effects of contact with journalists among mass shooting survivors have been quantitatively studied after a few incidents. Findings are evaluated here from the Jokela and Kauhajoki School shootings in 2007 and 2008, respectively. Four months after the incidents, 231 middle and high schools students from Jokela (ages 13–19) and 189 vocational school and polytechnic school students from Kauhajoki (ages 15–30) reported on their perceptions of their contact with journalists, and their recovery and wellbeing (Haravuori, Suomalainen, Berg, Kiviruusu, & Marttunen, 2011; Haravuori, Suomalainen, & Marttunen, 2011; Haravuori et al., 2012). In addition, a Norwegian study on the survivors of the 2011 Utøya Island terrorist attack is reviewed. Following this event, media participation was studied for a longer period of time, since media coverage was intense for several months following the attack, and again at the time of the trial (Thoresen, Jensen, & Dyb, 2014). Interviews were conducted with 285 survivors 14–15 months after the attack.

Journalists and reporters reached a majority of the survivors in all three incidents. However, the proportions who gave interviews differed between the groups. Journalists asked 63% of the Jokela students about the events and 60% of the approached students answered the journalists' questions. Those

approached by the journalists were older and more severely exposed to the events (Haravuori, Suomalainen, Berg, et al., 2011). In Kauhajoki, 58% of the students were asked about the events and 21% of them answered the questions. Again, more severely exposed students were approached more often (Haravuori, Suomalainen, & Marttunen, 2011). In Kauhajoki, the majority of the students were evacuated to one location and they were informed about the possibility of journalists asking for a comment and about their choice to not answer. The previous conflict between journalists and the Jokela community most likely influenced journalists' behaviors in Kauhajoki, but it is unclear how these differences in behaviors may have impacted Kauhajoki students (Raittila et al., 2010).

Students were asked an open question about "how did the reporter or reporters approach you?" The answers were grouped into three categories: positive (e.g., respectfully, politely), neutral (e.g., just approached, asked permission to interview), and negative (e.g., intrusively, boldly, attacked, took photos or interviewed after refusal). In Jokela, 17% of the students reported that reporters approached them in a positive way, 51% in a neutral way, and 32% in a negative way. In Kauhajoki, 6% reported being approached in a positive way, 65% in a neutral way, and 29% in a negative way. Age and sex did not affect the way the students perceived being approached. Those more severely exposed in Kauhajoki were more likely to report being approached in a positive way than other students (Haravuori, Suomalainen, & Marttunen, 2011).

Those who gave an interview were asked to further evaluate how it affected their wellbeing. About three out of four Jokela students perceived that giving an interview did not affect their condition, one fifth reported that their condition worsened, and 9% reported that they felt better after giving an interview. About one third of Kauhajoki students perceived that giving an interview worsened their condition, 61% reported that it did not have an effect, and 7% reported that they felt better afterwards. In both instances, students with PTSS were more likely to report that giving an interview worsened their condition (Haravuori, Suomalainen, & Marttunen, 2011).

Contact with journalists was analyzed as students who were (1) not approached, (2) approached and refused an interview, and (3) approached and interviewed. Among the surviving Jokela students, those who were approached and interviewed by reporters had higher levels of PTSS than those who were not approached (Haravuori, Suomalainen, Berg, et al., 2011). Conversely, symptoms did not differ between those who refused to be interviewed and those who were not approached by reporters. This was the case also when confounding factors, like sex and exposure severity, were included in the analyses.

The Finnish samples were also analyzed together and showed that being approached by a reporter compared to not being approached had an odds ratio

(OR) of 2.0 (95% CI [1.1, 3.6]), indicating higher levels of PTSS, even when factors like age, sex, study group, and level of exposure were controlled. Students who were interviewed compared to not approached were found to have an OR of 2.6 (95% CI [.3, 5.3]) for high levels of PTSS. Being approached but having refused an interview did not have a significant effect. These findings suggested that being approached and interviewed by journalists had an effect on posttraumatic distress in traumatized adolescents independent of their exposure level and demographic factors (Haravuori, Suomalainen, & Marttunen, 2011).

In the Norwegian study, a vast majority of the survivors (94%) were approached by reporters and most (88%) participated in interviews (Thoresen et al., 2014). The frequency of being approached by the media did not significantly differ based on age and in fact most of the young survivors (i.e., 91% of those between 13 and 16 years of age) were contacted by media. However, older students were more likely to be interviewed than younger students. Being approached by the media was appraised as negative or very negative by 11% of the sample, both positive and negative by 64% of the sample, and positive or very positive by 26% of the sample. Females were more likely to report negative appraisals of being approached. Media participation was perceived as quite a bit or extremely distressing among 13% of the survivors and 11% reported that they regretted participating in an interview. Older age groups reported that participation was more stressful.

Media participation among the Norwegian survivors was categorized as being (1) interviewed about the terror, (2) interviewed about the trial, or (3) contributing their own texts. None of these variables were related to posttraumatic stress reactions (Thoresen et al., 2014). But, because such a large proportion of survivors were approached by the media this association could not be properly analyzed. Appraisals of media participation as distressing and regretting participation were associated with greater levels of posttraumatic stress reactions when adjusted for demographics, social support, and feelings of being let down. Only the association of posttraumatic stress reactions and the perception of media participation as distressing remained significant after adjusting all media-related variables for each other and for the aforementioned variables. Positive appraisals of media participation were not found to be associated with posttraumatic stress reactions. The authors concluded that it could either be that media participation was more distressing for those with higher symptom levels, or that negative experiences with media participation increased symptom levels. Also, the Norwegian sample was composed of politically active young people, who may be more willing to take part in public discourse, some of them had received media training, and the survivors were described mainly in sympathetic ways in the media.

Before these three survivor samples, the effect of being interviewed on PTSS had been hypothesized to exist but had not yet been studied in samples of

sufficient size in quantitative studies. The findings among the Finnish samples, which included adolescent and young adult participants, were quite similar. One exception is that the proportion of survivors that did not give an interview was larger after the incident in Kauhajoki. Further, the vast majority of the Utøya Island terrorist attack survivors were contacted by the media. Generally, being approached by journalists and giving interviews was associated with higher levels of PTSS. The results also suggested an independent effect irrespective of the participants' levels of exposure. The Norwegian study demonstrated an association between the perception of media participation as distressing and posttraumatic stress reactions providing clues to possible mediating factors. Yet, most participants across the three studies reported neutral perceptions of their interactions with journalists.

Impact of News Coverage on PTSS Among Survivors and Surviving Communities

The association between disaster news coverage and psychological symptoms (e.g., PTSS, anxiety, depressive symptoms) has been observed in several studies after various incidents, across different age groups, and even in individuals without direct connection to the incident. It has been postulated that these reactions are observed among those who are prone to symptomatology beforehand (Otto et al., 2007). See Chapter 8 for a more indepth discussion of the media as a form of vicarious exposure.

Children and adolescents are known to view considerable hours of newscasts of catastrophic events (Pfefferbaum et al., 2001). Children directly involved in the Oklahoma City bombing (1995) watched more of the newscasts than children without a direct connection to the event (Pfefferbaum et al., 1999). In a study of 3,200 middle and high school students in Oklahoma City, 67% of the students (73% of the bereaved) reported that most or all of their television viewing was bombing-related 7 weeks after the bombing. They also had the highest level of hyperarousal symptoms (Pfefferbaum et al., 1999). Television exposure explained more of the variance in PTSS than physical or emotional exposure in 2,000 Oklahoma middle school students 7 weeks after the event (Pfefferbaum et al., 2001). Similarly, there was an association between viewing intense images and probable posttraumatic stress disorder and depression among Manhattan residents who were directly affected by the 9/11 terrorist attacks (Ahern et al., 2002).

The news was widely followed through different media outlets among the surviving students of Jokela High School. Television was the most frequently (94%) followed media. Students also reported frequent use of the Internet (84%), newspapers (78%), and radio (approximately 50%; Haravuori, Suomalainen, Berg, et al., 2011). Following the news coverage was perceived to have no

effect on one's condition or feelings in half of the participants, 15% reported feeling better, and one third reported feeling worse. However, there was no association with the severity of exposure and the reported effects of news coverage on feelings. But, females reported feeling worse more often than males. When Jokela students were compared to students from a distant school, the Jokela students were more likely to report feeling worse after following the news (Haravuori, Suomalainen, Berg, et al., 2011).

The news broadcasts and postings were also widely followed through different media outlets among the Kauhajoki students (Haravuori, Suomalainen, & Marttunen, 2011). Television was the most frequently (92%) followed media. Students also reported frequent use of the Internet, newspapers, and the majority also listened to radio (88%). The local radio station was one of the first news outlets to broadcast information about the event. Following the news was reported to have no effect on one's condition or feelings in one third of the answers, 15% reported feeling better, and as many as half reported feeling worse (Haravuori, Suomalainen, & Marttunen, 2011).

If the students followed a greater number (at least 3–4) of media outlets they were more likely to report feeling worse afterwards than those who followed fewer. Jokela students who followed a higher number of media outlets were observed to also have higher PTSS but this effect attenuated when other confounding factors were taken into account (Haravuori, Suomalainen, Berg, et al., 2011). When a combined sample of Jokela and Kauhajoki students was studied, an effect of following more news outlets on PTSS was observed (Haravuori, Suomalainen, & Marttunen, 2011). Exposure to television and newspaper coverage of the event was associated with PTSS, while exposure to radio and Internet were not (Haravuori, Suomalainen, & Marttunen, 2011). Print media has been found to be more strongly associated with PTSS than broadcast media in at least one previous study (Pfefferbaum et al., 2003). We can only speculate on the reasons for this, because one would expect that following the Internet requires intentional effort like print media and permits repeated exposure to potentially disturbing images and text. One hypothesis could be that in some cases social online communities may provide protective peer support.

A sample of San Diego East County residents were interviewed after two separate school shootings happened within the same school district within a month in 2001 (Palinkas, Prussing, Reznik, & Landsverk, 2004). The study included 85 participants 6 months after the incidents. Of those interviewed, 53% reported intrusive reminders of the trauma associated with intense media coverage and subsequent rumors, hoaxes, and threats, 45% reported avoidance symptoms, 31% reported hypervigilance symptoms, and 27% reported other types of psychological symptoms. The two most common responses given were intense anger at the media for constantly reminding them of what they had experienced and efforts to avoid similar reminders in conversations.

Conclusions

The fields of journalism and the media have intriguing and complex roles in the aftermath of mass shootings. Aspects of the event, such as the recovery process and the victims, are mediatized thoroughly. How the media portray individuals and communities after mass shootings has a direct impact on them. The sheer masses of reporters evading the community may be perceived as distressing, not to mention the indiscreet and harassing ways some journalists use to get comments from the survivors and bereaved.

National and international news reporters and published news sources have been observed to be more intrusive and unauthentic towards the grieving (Jemphrey & Berrington, 2000). This may be because the local media and newsroom personnel may be among the personally affected and grieving. They are reporting about an incident that happened to their community, and they are responsible to both their profession and community. These were argued to be among the factors associated with successful student online journalism after the Virginia Tech shooting (Moritz & Kwak, 2009). Student journalists published versatile material from inside sources; and they managed to do it in a professional and sensitive way that served their own community.

Authorities, like police and health care professionals, should prepare for interactions with the media in crisis situations, while journalists should continue to evaluate and discuss their work guidelines and ethics in relation to working with vulnerable survivors and grieving families (Newman & Shapiro, 2014). It is recommended that authorities inform the masses efficiently and effectively, and media personnel report accurately and respectfully. This approach would best serve individuals and communities as they find help, support, and comfort in times of crisis and would enable them to utilize existing and new media resources.

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Part IV

Psychological Considerations for Impacted Individuals

Mental Health Outcomes Following Direct Exposure

Laura C. Wilson

Exposure to traumatic events has consistently been found to increase survivors' risk for a myriad of adverse emotional, cognitive, behavioral, and physical health outcomes (see Norris, Friedman, & Watson, 2002; Norris, Friedman, Watson, Byrne, Diaz, & Kaniasty, 2002; Schnurr & Green, 2004 for reviews). These posttrauma difficulties have been found to range from mild transient stress reactions to persistent and debilitating psychopathology (Norris, Friedman, Watson, Byrne, et al., 2002). Although almost all individuals (i.e., 89.7%) will experience at least one traumatic event during their lifetime, only a small percentage of the population reports clinically significant levels of symptomatology as a result of exposure to traumatic events (e.g., 12-month prevalence rate of 4.7% for posttraumatic stress disorder (PTSD); Kilpatrick et al., 2013). In fact, many survivors display surprising levels of resiliency, or adaptation to stress, following traumatic events. For example, Norris, Tracy, and Galea (2009) found that approximately one half of individuals exposed to a terrorist attack never experienced more than mild distress. The heterogeneity observed among survivors has generated great interest among psychologists wanting to better understand the effects of trauma exposure on survivors' short- and long-term psychological functioning. The focus of this chapter will be on individuals' mental health functioning following direct exposure to mass shootings.

To review the literature on the mental health outcomes associated with direct exposure to mass shootings, several topics will be addressed. First, I will comment on the state of the literature and the implications of these issues as they relate to this chapter. Second, I will discuss the controversy of how to define exposure and how this applies to mass shooting survivors. Third, I will examine how individuals' levels of exposure to a mass shooting may impact their risk for psychopathology. Next, I will consider whether mass shootings may be associated with greater risk for psychological difficulties when compared to other types of trauma. Fifth, I will identify and discuss the types of psychopathology

survivors typically experience. Lastly, I will examine factors that may help explain the heterogeneity observed among survivors. Due to space constraints, this chapter cannot serve as a comprehensive review of the literature. Rather, my goal is to highlight the key features of the literature base and identify areas that future research should further expand on.

State of the Literature

Prior to discussing the available literature on mental health outcomes in individuals impacted by mass shootings, it is first necessary to highlight three key features of the literature. These issues should be kept in mind when reading the discussion below because these observations about the state of the literature may influence the interpretation of the findings or the implications of the conclusions.

First, the trauma literature, as a whole, would be best described as a series of case studies (Norris, Friedman, Watson, Byrne, et al., 2002). That is, the majority of published articles on trauma have examined particular events that each have unique characteristics that make it difficult to generalize beyond that specific event and the examined population. In these situations, meta-analyses and systematic literature reviews are often recommended because, as aggregates of the literature, these types of methodologies provide more generalizable conclusions. For example, many of the mass shooting articles have been written about the Virginia Tech shooting, which occurred on April 16, 2007 (e.g., Hughes et al., 2011; Littleton, Axsom, & Grills-Taquechel, 2011; Vicary & Fraley, 2010). As Virginia Tech was the deadliest mass shooting in the United States to date (Hughes et al., 2011), it is difficult to determine whether the results obtained from that particular population and event would apply to survivors of other mass shootings. Unfortunately, there is a lack of meta-analyses and systematic reviews within this area of the literature. There is only one known meta-analysis, which examined the dose-response relationship in mass shooting survivors (i.e., Wilson, 2014). Therefore, the mass shooting literature is almost exclusively a series of case studies and this should be kept in mind when considering the findings discussed here.

Second, in comparison to other types of trauma (e.g., sexual assault, combat, natural disasters), mass shootings are relatively understudied and less is known about the mental health consequences of these incidents. This can be illustrated by a systematic literature search that was conducted for the purposes of this chapter. The search used PsycINFO and PubMed, and the keywords included *mass murder*, *mass shooting*, *mass violence*, *mass trauma*, *mass casualty*, *school shooting*, *school violence*, and *shooting*, cross-referenced with *posttraumatic stress disorder*, *acute stress disorder*, *trauma symptoms*, *posttraumatic stress*

symptoms, and *stress reactions*. The search was limited to peer-reviewed journal articles published in English.

Using this search procedure, 142 total unique citations were identified and reviewed for potential inclusion. Articles were deemed relevant if they were empirical articles that examined PTSD in the aftermath of a mass shooting in a sample of individuals who satisfied the DSM-5 PTSD Criterion A (American Psychiatric Association, 2013), which will be discussed below in greater detail. Only a total of 16 articles were identified as meeting these criteria. Furthermore, many of these articles examined duplicate samples. For example, 4 of these 16 articles relied on the same group of participants exposed to a mass shooting in a Luby's restaurant in Killeen, Texas on October 16, 1991 (i.e., North, Smith, & Spitznagel, 1994, 1997; North, Spitznagel, & Smith, 2001; North, McCutcheon, Spitznagel, & Smith, 2002). The 16 articles identified in this search focused on only five mass shootings (i.e., Falun, Sweden on June 11, 1994; Jokela High School in Jokela, Finland on November 7, 2007; Luby's restaurant in Killeen, Texas on October 16, 1991; Northern Illinois University in DeKalb, Illinois on February 14, 2008; Virginia Tech in Blacksburg, Virginia on April 16, 2007). It is shocking that so few studies were located in this search and that only a total of five mass shootings were examined in the identified articles.

Third, the prior research that has been conducted in this area has included a wide range of exposure types. Although most studies have included participants who would be characterized as experiencing direct exposure (e.g., heard gunfire, saw people injured), these participants are often lumped in with a larger group of people who distally experienced the event (e.g., were on campus) or reported no connection to the event. For example, Littleton, Axsom, and Grills-Taquechel (2011) indicated that 30% of participants experienced severe direct exposure (e.g., in one of the buildings where the shootings occurred), 45% of participants experienced moderate direct exposure (e.g., were on campus), and 25% of participants did not report direct exposure to the event. However, Littleton, Axsom, and Grills-Taquechel (2011) reported prevalence rates of probable PTSD for the entire sample. Due to the nature of the literature, it is difficult to differentiate the impact of direct exposure from distal or an absence of exposure. Because of the overall dearth of studies focused on the impact of direct exposure on survivors, this review will have to rely heavily on literature that is based on participants with more indirect experiences (see Chapter 12 for a more thorough discussion of the impact of mass shootings on communities).

Overall, limited research has been dedicated to examining the mental health outcomes associated with exposure to mass shootings, and these studies have focused on a few particular events and included a wide range of exposure types. The discussion presented here is therefore limited by the small and homogenous literature base that would most accurately be

described as a series of case studies. Regardless of the identified issues with the available empirical evidence, the information discussed here provides a basis for researchers and clinicians to better understand the psychological consequences observed within those individuals directly impacted by mass shootings.

Definition of Exposure

When examining posttrauma outcomes following mass shootings, another key issue to consider is how to define “exposure.” It is apparent that individuals would meet the definition of exposure if they directly witnessed the event in person, such as seeing others be injured or killed, hearing gunfire, or if they were injured themselves. However, it is less clear whether an individual would meet the definition of exposure if they learned about details of the event through another person or watched extensive TV coverage of the event. Before discussing the mental health outcomes associated with exposure to a mass shooting, it is necessary to define “exposure.”

In the trauma literature, direct exposure is often defined based on the stressor criterion (i.e., Criterion A) of the PTSD diagnosis, as listed in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM; American Psychiatric Association, 2013). This criterion defines trauma exposure as actual or threatened death, serious injury, or sexual violence through direct exposure, witnessing the event in person, learning that a relative or close friend was exposed to the event, or extreme exposure to aversive details of the event not including through media or television (American Psychiatric Association, 2013). However, Criterion A has been a source of substantial controversy since it was first introduced (e.g., Brewin, Lanius, Novac, Schnyder, & Galea, 2009; Kilpatrick, Resnick, & Acierno, 2009; Weathers & Keane, 2007a, 2007b). For example, prior studies have found evidence of distress in individuals who report forms of exposure that do not meet this definition (e.g., TV coverage). Based on a nationwide study, 17% of the U.S. population endorsed PTSD symptoms 2 months following the September 11 terrorist attacks even though only a small fraction of the population would have met the DSM-5 definition of exposure (i.e., Criterion A; Silver, Holman, McIntosh, Poulin, & Gil-Rivas, 2002). Similar results have been demonstrated following other mass violence incidents and disasters, such as the Oklahoma City bombing (Pfefferbaum et al., 2002) and the Challenger explosion (Terr, Bloch, Michel, Shi, Reinhardt, & Metayer, 1999). Findings such as these are often cited as evidence that Criterion A may be too restrictive since individuals who are geographically distant from and have no personal ties to a traumatic event may still display PTSD symptoms or other forms of stress reactions (e.g., depression).

Exposure in this chapter will be broadly defined as personally witnessing or having a strong personal tie to, or exposure to, graphic and upsetting details about a mass shooting. This definition was chosen because forms of exposure that do not satisfy Criterion A have been found to be associated with event-related symptomatology following mass shootings. Fallahi and Lesik (2009) found a significant positive association between the amount of TV viewed following the Virginia Tech shooting and PTSD symptoms in college students at a geographically distant university. Although many experts may argue that TV coverage should not be considered trauma exposure, previous research suggests that some individuals may present with clinically significant levels of distress stemming from images and details they were exposed to through TV coverage of mass shootings. Additionally, low levels of exposure to mass shootings have been linked to heightened levels of distress (Orcutt, Miron, Seligowski, 2014). For example, Hughes et al. (2011) found that following the Virginia Tech shooting one of the strongest predictors of PTSD was an inability to confirm the safety of friends. Finally, due to the aforementioned limitations of the literature, this broad definition was necessary to allow some freedom in the empirical evidence that is applicable to this chapter.

Although some individuals' experiences during or following a mass shooting may not fit the typical definition of trauma exposure, they may still report psychological symptoms and their difficulties could warrant clinical intervention. For example, Vicary and Fraley (2010) found that nearly 75% of students at Virginia Tech and Northern Illinois University who participated in their study endorsed significant psychological distress (e.g., PTSD, depression) 2 weeks after the shootings that occurred at these schools. Although there is heated debate about the definition of trauma exposure and whether a diagnosis of PTSD is appropriate for someone who does not satisfy Criterion A, empirical evidence suggests that the impact of mass shootings on mental health extends beyond the survivors who directly witness the event (Norris, 2007). With this in mind, the mental health impact of a wide range of exposure types should be considered when working with individuals in the aftermath of mass shootings.

Dose-Response Relationship

A third topic to consider is how individuals' levels of exposure to a mass shooting may differentially impact their mental health outcomes. Perhaps the most frequently discussed theory describing the relationship between level of exposure and posttrauma functioning is called the dose-response relationship (Dohrenwend & Dohrenwend, 1974). According to this theory, a greater dose of trauma (i.e., level of exposure) will be associated with greater risk for the development of posttrauma psychopathology (Bowman & Yehuda, 2004). For example, an individual who directly witnessed a mass shooting in person

(e.g., saw the shooter, was physically injured) will be at greater risk of experiencing psychological difficulties than an individual who learned that the event happened to a loved one.

The dose-response relationship originated in the DSM-III (American Psychiatric Association, 1980), which stated that “the severity, duration, and proximity of an individual’s exposure to the traumatic event are the most important factors affecting the likelihood of developing this disorder” (p. 426). As can be seen in the excerpt from DSM-III, the level of direct exposure an individual experiences can be conceptualized in a number of ways, including physical distance, social connection, temporal duration, number of exposures, degree of life threat, and extent of physical injury. Additionally, based on this conceptualization, an individual’s level of exposure is considered central to understanding the development and maintenance of psychopathology.

Although many studies have found support for this theory in a wide range of trauma populations, such as disaster survivors (e.g., Furr, Comer, Edmunds, & Kendall, 2010), military veterans (e.g., Brewin, Andrews, & Valentine, 2000) and crime victims (e.g., Brewin et al., 2000), the dose-response relationship has been a source of great contention. Most notably, several studies have failed to find evidence of this relationship (e.g., Ehlers, Mayou, & Bryant, 1998; Uranso et al., 1999). Furthermore, even when studies find support for the dose-response relationship, the results often support other predictors (e.g., preexisting mental health issues) as more informative in understanding individuals’ risk for posttrauma psychopathology (Bowman, 1997). Therefore, the utility of the dose-response theory in understanding trauma survivors’ risk of developing posttrauma psychopathology has been questioned and therefore may not be as useful as was once thought.

Although the level of exposure an individual experiences during a trauma has historically been cited as one of the most informative predictors for understanding their risk of psychopathology, this claim has been challenged. This question was examined in a recent meta-analysis investigating the dose-response theory in terms of predicting PTSD symptoms following mass shootings (Wilson, 2014). This meta-analysis included 13 independent effect sizes and found an overall significant weighted mean effect size of $r = .19$. This result suggests that as an individual’s level of exposure to a mass shooting increased, their risk for event-related PTSD symptoms significantly increased. This supports the dose-response theory. Because the effect size was only small to medium in magnitude, the finding also indicated that although the level of event exposure was a significant predictor, it was not adequate as the sole predictor of PTSD symptoms. Therefore, it is essential that additional factors, such as pretrauma (e.g., preexisting mental health issues), peritrauma (e.g., dissociation) and posttrauma (e.g., social support) influences, be considered when understanding survivor mental health outcomes following

mass shootings (Ozer, Best, Lipsey, & Weiss, 2003). Findings related to these additional influences will be discussed below.

Despite the limitations of the dose-response model, a survivor's level of exposure to a mass shooting can still be used to guide mental health intervention because, on average, greater exposure is associated with significantly greater risk of posttrauma difficulties (Wilson, 2014). Delivering mental health services in the aftermath of disasters can pose quite a challenge for professionals. Emergency management coordinators and crisis response teams often have to make quick decisions when coordinating and allocating mental health services, and typically have access to limited information. In such situations, the level of exposure within a population can be used as an initial, but imprecise, measure of risk for psychopathology until more thorough individualized assessment can be completed.

Type of Trauma

When discussing mental health in the aftermath of mass shootings, a fourth feature to examine is whether or not this type of trauma is associated with unique psychological consequences. As previously mentioned, the majority of trauma survivors do not develop long-lasting persistent psychopathology (Breslau, 2009). On the other hand, prior research suggests that mass shooting survivors may be at greater risk of mental health difficulties when compared to other types of trauma (e.g., natural disasters; Norris, Friedman, & Watson, 2002; Norris, Friedman, Watson, Byrne, et al., 2002). After accounting for other event and participant characteristics, Norris and colleagues (Norris, Friedman, & Watson, 2002; Norris, Friedman, Watson, Byrne, et al., 2002) found that mass violence (e.g., mass shooting, bombing) was associated with more severe impairment than natural and technological disasters. Specifically, 67% of mass violence survivors were identified as being severely or very severely impaired. Conversely, only 39% of technology disaster survivors and 34% of natural disaster survivors were either severely or very severely impaired. Interestingly, none of the mass violence survivors identified in the literature review conducted by Norris, Friedman, Watson, Byrne, et al. (2002) reported minimal or transient impairment, and the majority of individuals identified in the moderate impairment category were those who only experienced indirect exposure. Thus, prior research suggests that direct exposure to a mass shooting often leads to serious psychological difficulties (Norris, 2007) and mass shootings may be associated with greater posttrauma difficulties when compared to other types of trauma (Norris, Friedman, & Watson, 2002).

The greater risk of posttrauma difficulties among mass shooting survivors is further supported when prevalence rates of psychopathology following mass

shootings are compared to other types of trauma. Substantial research has demonstrated that, on average, less than 10% of trauma survivors develop PTSD (Breslau, 2009; Kessler, Berglund, Demler, Jin, & Walters, 2005). Conversely, Norris (2007) reported that studies have demonstrated prevalence rates ranging from 10 to 36% for PTSD among mass shooting survivors. A recent study found that although a large percentage of individuals following a mass shooting were either resilient (46.1%) or displayed short-term stress reactions (41.1%), approximately 12% reported persistent PTSD (Miron, Orcutt, & Kumpula, 2014). This is slightly higher than the average prevalence of PTSD among trauma survivors as a whole (Breslau, 2009). Even though the majority of evidence suggests that individuals exposed to mass shootings are typically resilient or only display transient stress reactions, this type of traumatic event may be associated with greater risk for persistent symptomatology when compared to other forms of trauma (e.g., natural disasters, technological disaster).

If prior research suggests that mass shooting survivors are at increased risk of persistent and debilitating psychological difficulties, then this leads to the question of “why?” Trauma survivors, across all types of trauma, are susceptible to a wide range of negative beliefs, including self-blame, hopelessness, and overestimation of danger (Briere & Scott, 2006). It has been proposed that the heightened risk of posttrauma difficulties among those impacted by mass shootings is because of the unique characteristics of this type of event. Specifically, these incidents are purposeful and malicious acts, the incident is perceived as random and unpredictable, and victims tend to be indiscriminately selected (Briere & Elliott, 2000; Carlson & Dalenberg, 2000; Norris, Friedman, & Watson, 2002). These unique characteristics of mass shootings may be associated with greater feelings of hopelessness and have more detrimental effects on survivors’ cognitions (e.g., just world belief, survivor guilt) than other types of trauma (Norris, Friedman, & Watson, 2002). These maladaptive thoughts and negative beliefs in turn increase risk for psychopathology (Dalgleish, 2004).

The heightened risk of mental health issues that stems from the unpredictable and malicious nature of these events should be kept in mind by those individuals charged with delivering mental health services in the immediate and long-term aftermath of mass shootings. Depending on the situation and the patients’ needs, treatment goals may need to be tailored to address the maladaptive thoughts that may be contributing to psychological difficulties. Issues related to clinical intervention following mass shootings will be further discussed in Part V of this book. Despite the fact that mass shooting survivors may be at increased risk of posttrauma mental health difficulties due to the unique characteristics of this type of event, it is important to remember that only a minority of survivors will experience long-term distress (Miron et al., 2014).

Mental Health Outcomes

A fifth issue relevant to the study of posttrauma functioning is to identify the types of short- and long-term difficulties that survivors typically experience. It should be noted that trauma can impact any aspect of an individual's functioning, including physical health (e.g., immune functioning, cardiovascular health; see Schnurr & Green, 2004; D'Andrea, Sharma, Zechoski, Spinazzola, 2011 for reviews), sleep (see Harvey, Jones, & Schmidt, 2003 for a review), sexual functioning (see De Silva, 2001 for a review), and attention (Aupperle, Melrose, Stein, & Paulus, 2012). For the purposes of this chapter, mental health symptoms and psychological disorders will be the focus. Regardless, it should be kept in mind that many of the devastating consequences of trauma (e.g., sense of emptiness, disruption in trust, decline in spirituality) may not be sufficiently captured by the diagnostic criterion of psychological disorders (Briere & Scott, 2006). This is important for clinicians to consider because their patients' difficulties may not be adequately detected with structured assessment tools or be accurately described with diagnostic labels. The key to consider is whether or not the patient is reporting distress and/or impairment as a result of their exposure to a mass shooting. The adverse consequences of mass shootings extend far beyond what will be discussed in this chapter.

PTSD is the most consistently observed psychological disorder following mass shootings (North et al., 1994). It has been demonstrated that only a small percentage of those impacted by mass shootings deny having any symptoms of PTSD (i.e., 3.4%; North et al., 1994). Although almost all mass shooting survivors endorse experiencing some level of psychological difficulties in the immediate aftermath of the event, the majority of them do not report persisting or debilitating psychopathology. North and colleagues (1994) found that 20.3% of male participants and 28.8% of female participants were new cases of PTSD following exposure to a mass shooting. Although PTSD is the most commonly reported disorder, individuals impacted by mass shootings also report other forms of psychopathology. Specifically, North and colleagues (1994) found that 6.9% of male participants and 11.3% of female participants reported a new psychological diagnosis other than PTSD (e.g., major depression disorder, substance use) after exposure to a mass shooting. In this chapter, emphasis will be placed on PTSD symptoms in the aftermath of mass shootings because it is the most commonly endorsed disorder.

The aforementioned systematic review conducted for the purposes of this chapter used key terms related to mass shootings and PTSD, and yielded 16 relevant studies. Of the 16 studies, 14 reported prevalence rates of probable Acute Stress Disorder (ASD) or PTSD among individuals impacted by a mass shooting. Within the first month following the examined mass shootings, the prevalence rates of probable ASD ranged from 26% (North et al., 2002) to 64% (Vicary & Fraley, 2010). From 2 to 6 months following the mass shootings,

the prevalence of probable PTSD ranged from 15.4% (Hughes et al., 2011) to 28% (Littleton, Axsom, and Grills-Taquechel, 2011). From 7 months to 1 year following the mass shootings, the prevalence of probable PTSD ranged from 11.4% (Kumpula, Orcutt, Bardeen, & Varkovitzky, 2011) to 27% (Littleton, Axsom, and Grills-Taquechel, 2011). North and colleagues (North et al., 2001; North et al., 2002) found that the prevalence of probable PTSD 3 years following a mass shooting was approximately 18 to 19%. Overall, the findings of the systematic literature review suggested that the prevalence rates of PTSD following mass shootings decreased with time and many individuals who initially met criteria for ASD or PTSD did not report persisting long-term difficulties at a later time. A similar impact of time on prevalence rates has been observed in other trauma populations (Norris, Friedman, & Watson, 2002). As previously discussed, these results also confirm that mass shooting survivors may be at heightened risk of PTSD compared to other trauma populations (i.e., less than 10% of trauma survivors develop PTSD; Breslau, 2009; Kessler et al., 2005).

Substantial prior research demonstrates that trauma increases survivors' risk for many psychological disorders beyond PTSD (Brewin et al., 2009). These post-traumatic mental health responses have been found to include but are not limited to depression, anxiety (e.g., panic, generalized anxiety, specific phobia), somatization (e.g., conversion disorder), substance use, and dissociation (Briere & Scott, 2006; Fullerton & Ursano, 2005). Similar to other types of trauma, an array of mental health outcomes other than PTSD have been found in survivors of mass shootings. But, these difficulties have received substantially less attention in the literature than the more common diagnosis of PTSD.

Because fewer studies have examined non-PTSD disorders, it is difficult to present conclusions based on the literature base. However, a few specific studies can be referenced that point to the increased risk for non-PTSD psychological diagnoses in survivors of mass shootings. These previous studies suggest that mass shooting survivors may endorse a wide range of symptoms and diagnoses, including but not limited to depression (e.g., Johnson, North, & Smith, 2002; Littleton, Axsom, and Grills-Taquechel, 2011; North et al., 1994; Vicary & Fraley, 2010), substance use (e.g., Johnson et al., 2002; North et al., 1994; Suomalainen, Haravouri, Berg, Kiviruusu, & Marttunen, 2011), panic disorder (e.g., Johnson et al., 2002; North et al., 1994), generalized anxiety disorder (e.g., North et al., 1994), and overall psychiatric distress (e.g., Suomalainen et al., 2011). North et al. (1994) found that besides PTSD, the most commonly reported mental health issue among female mass shooting survivors was depression and among male mass shooting survivors was substance use. In general, PTSD is the primary mental health outcome examined and observed in the aftermath of mass shootings. However, the limited available evidence suggests that mass shooting survivors are at increased risk of a plethora of psychological difficulties, similar to those observed in other trauma populations.

Predictors of Mental Health Outcomes

A final area of investigation to consider is predictors of mental health outcomes among survivors. Because not all trauma survivors develop persistent post-trauma mental health difficulties (Friedman, Keane, & Resick, 2007), studies have been dedicated to elucidating this observed heterogeneity by examining demographic characteristics (e.g., gender, age), pretrauma predictors (e.g., prior trauma history, prior psychopathology), peritrauma factors (e.g., level of exposure, peritraumatic dissociation), and posttrauma influences (e.g., coping strategies, social support; see Brewin et al., 2000; DiGangi et al., 2013; Ozer et al., 2003) that may help account for these individual differences. These studies suggest that the etiology of posttrauma disorders, such as PTSD and depression, is very complex and multifaceted. Because greater emphasis has been placed on PTSD and a larger literature base is available, the discussion of predictors of mental health outcomes following mass shootings will focus on PTSD. The results of the previously mentioned systematic literature review that yielded 16 relevant articles will be referenced in this discussion.

Demographic characteristics

Previous studies examining numerous types of trauma have found that demographic variables, such as gender and socioeconomic status, are risk factors for the development of PTSD (Brewin et al., 2000). In the systematic literature search of articles examining PTSD following mass shootings, 11 articles assessed how the demographic characteristics of the samples were related to PTSD. The following demographic factors were not significantly related to PTSD: age (i.e., Bardeen, Kumpula, & Orcutt, 2013; Kumpula et al., 2011; Littleton, Kumpula, & Orcutt, 2011; Mercer et al., 2012; North et al., 1997; North et al., 2002; Suomalainen et al., 2011), year in school (i.e., Mercer et al., 2012), years of education (i.e. North et al., 1997; North et al., 2002), marital status (i.e., North et al., 1997; North et al., 2002), socioeconomic status (i.e. Suomalainen et al., 2011), and living arrangements (i.e., Suomalainen et al., 2011). Four articles reported that race and ethnicity were not significantly related to PTSD (i.e., Bardeen et al., 2013; Kumpula et al., 2011; Mercer et al., 2012; North et al., 1997; North et al., 2002). Conversely, one study found that African American participants reported significantly lower risk of PTSD and Asian American participants reported significantly greater risk of PTSD (Littleton, Kumpula, & Orcutt, 2011). Seven articles provided information on gender differences related to PTSD. Six of these seven articles found that women reported significantly greater PTSD than men (i.e., Hughes et al., 2011; North et al., 1994, 1997; North et al., 2001; Suomalainen et al., 2011; Vicary et al., 2010), which is consistent with the trauma literature as a whole (Tolin & Foa, 2006).

Pretrauma factors

Research has suggested that many variables that were once thought of as outcomes of trauma (e.g., coping style) are in fact preexisting risk factors that increase survivors' likelihood of developing PTSD (DiGangi et al., 2013). In the systematic literature search, eight articles examined the relationship between pretrauma factors and postshooting PTSD. The factors examined in the literature can be grouped into three categories: coping strategies, preshooting trauma/stress, and a history of psychopathology.

Coping strategies Coping refers to any cognitive or behavioral strategy used to manage stressful situations (Folkman & Lazarus, 1980; Lazarus & Folkman, 1984). Individuals who reported emotion regulation difficulties (Bardeen et al., 2013) or experiential avoidance (Kumpula et al., 2011) prior to the shooting were more likely to report postshooting PTSD.

Preshooting trauma Littleton, Kumpula, and Orcutt (2011) and Kumpula et al. (2011) found that preshooting trauma/stress was significantly related to greater PTSD. Conversely, Mercer et al. (2012) reported that there was no significant relationship between preshooting trauma and postshooting PTSD.

Preshooting psychopathology Three articles reported a positive correlation between preshooting PTSD and postshooting PTSD (Bardeen et al., 2013; Kumpula et al., 2011; Sewell, 1996). Conversely, North and colleagues (1994) reported that preshooting PTSD was not significantly related to postshooting PTSD.

Five articles examined other types of psychopathology (e.g., anxiety, depression). Littleton, Axsom, and Grills-Taquechel (2011), North et al. (1994, 1997), and Sewell (1996) found that at least one type of non-PTSD preshooting psychopathology was positively related to postshooting PTSD. Conversely, Littleton, Kumpula, and Orcutt (2011) found that preshooting depression and anxiety were not significantly related to postshooting PTSD.

Peritrauma factors

Some evidence suggests that peritraumatic influences, such as peritraumatic emotions and dissociation, are the strongest predictors of PTSD (Ozer et al., 2003). Twelve articles were identified in the systematic literature search that discussed the relationship between peritrauma factors and postshooting PTSD. The peritrauma factors in the literature can be grouped into two categories: exposure level and dissociation.

Exposure Nine articles found that exposure was significantly correlated with PTSD (Bardeen et al., 2013; Fergus, Rabenhorst, Orcutt, & Valentiner, 2011; Hughes et al., 2011; Kumpula et al., 2011; Littleton, Kumpula, & Orcutt, 2011; Mercer et al., 2012; Stephenson, Valentiner, Kumpula, & Orcutt, 2009; Suomalainen et al., 2011; Vicary et al., 2010). Sewell (1996) found that exposure was slightly positively correlated, albeit not statistically significant, with PTSD at 1 week, but was not related to PTSD at 3 months. North et al. (1997) reported that exposure was not significantly correlated with PTSD at 6 to 8 weeks or 1 year postshooting.

Peritraumatic dissociation One article found that dissociation during the shooting was significantly positively correlated with PTSD at both 27 days and 35 weeks postshooting (Kumpula et al., 2011).

Posttrauma factors

Because most studies are cross-sectional, posttrauma factors are among the most commonly examined variables in terms of survivor psychopathology. Fifteen articles discussed the relationship between posttrauma factors and postshooting PTSD. These factors can be grouped into the following categories: coping strategies, social support, elapsed time, physiology/genetics, and psychopathology/symptomatology.

Coping strategies Two articles found that emotion regulation difficulties and maladaptive coping following the shooting were significantly associated with greater postshooting PTSD (Bardeen et al., 2013; Littleton, Axsom, & Grills-Tauchel, 2011). Greater experiential avoidance and reduced trauma processing were significantly associated with greater postshooting PTSD (Kumpula et al., 2011; Sewell, 1996). North et al. (2001) found that using logic to cope was associated with significantly lower levels of postshooting PTSD, whereas assimilation, or the integration of the event into the person's cognitive schemas, was not related to PTSD.

Social support Suomalainen and colleagues (2011) found a significant negative correlation between social support and postshooting PTSD, but failed to find a significant relationship between perceived mental support from a non-guardian adult and PTSD. North and colleagues (2001) found that seeking out the support of others was significantly associated with reduced PTSD at 1 month, but not at 1 year or 3 years. Three articles found that social support was not significantly related to postshooting PTSD (Mercer et al., 2012; North et al., 1994; Sewell, 1996).

Elapsed time Vicary et al. (2010) and Bardeen et al. (2013) found that PTSD significantly reduced in severity with time following the mass shooting.

Physiology/genetics Fergus et al. (2011) found that heart rate, skin conductance, and cortisol levels measured during a writing and reading task about the shooting were not significantly related to PTSD at 8.8 weeks postshooting. Mercer et al. (2012) found that STin2 and 5-HTTLPR serotonin transporter genotypes were not significantly related to PTSD at 3.2 weeks postshooting. However, Rs25531 and 5-HTTLPR multimarker genotypes were significantly related to PTSD at 3.2 weeks postshooting.

Psychopathology North and colleagues (1997) found that postshooting psychopathology, not including PTSD, was significantly positively associated with postshooting PTSD at 6 to 8 weeks and 1 year. Whereas, North and colleagues (2002) found that postshooting comorbid psychopathology was not significantly related to postshooting PTSD at 3 years.

Three articles found that PTSD immediately following the shooting was significantly positively correlated with long-term PTSD (Kumpula et al., 2011; Littleton, Axsom, and Grills-Taquechel, 2011; Littleton, Kumpula, & Orcutt, 2011). Three articles found that postshooting depression symptoms were significantly positively correlated with postshooting PTSD (Larsson, 2000; Littleton, Axsom, and Grills-Taquechel, 2011; North et al., 1994). Whereas Littleton, Kumpula, and Orcutt (2011) found that postshooting depression symptoms were not significantly correlated with PTSD. Three articles found that postshooting anxiety was significantly positively correlated with postshooting PTSD (Larsson, 2000; Littleton, Axsom, D., & Grills-Taquechel, 2011; Littleton, Kumpula, & Orcutt, 2011).

Somatic/physical concerns (Larsson, 2000; Stephenson et al., 2009), social dysfunction (Larsson, 2000; Stephenson et al., 2009), insomnia (Larsson, 2000), and cognitive concerns (Stephenson et al., 2009) were significantly positively correlated with postshooting PTSD. Conversely, alcohol use was not significantly positively correlated with postshooting PTSD (North et al., 1994).

Summary of predictors of mental health outcomes

Prior research has consistently demonstrated a large amount of variability among mass shooting survivors, with the majority of individuals reporting either resiliency or transient distress (Miron et al., 2014). Numerous factors have been examined as potential explanations for this heterogeneity. Overall, a review of the literature suggests that survivor gender, level of exposure, and pre- and postshooting psychopathology are among the strongest predictors of PTSD in the aftermath of mass shootings. Although little empirical evidence is available assessing whether these factors can help account for variability in other forms of psychopathology (e.g., depression, panic) following mass

shootings, it can be assumed that these findings likely generalize to the development and maintenance of non-PTSD psychological disorders.

Conclusion

Based on the review of the literature presented here, several conclusions emerge. First, survivors of mass shootings tend to report resiliency or mild transient stress reactions. Although most survivors report experiencing a few symptoms that are consistent with those seen in cases of ASD or PTSD, the symptoms typically do not meet full criteria for a diagnosis and dissipate within a few weeks of the shooting. Second, a wide range of experiences and levels of exposure to a mass shooting can lead to trauma-related symptomatology, such as watching extensive TV coverage or an inability to confirm the safety of friends. Individuals who do not meet Criterion A of the PTSD diagnostic criteria may still report distress and impairment, and clinical intervention may be appropriate. Third, although there are a lot of similarities in the mental health outcomes of survivors of mass shootings and other types of trauma, the available empirical evidence suggests that mass shootings may be associated with heightened risk of posttrauma psychopathology due to the unique characteristics of these events. Overall, clinicians are encouraged to complete a thorough assessment to consider all potential factors that may be contributing to the onset and maintenance of their patients' difficulties. Furthermore, it is recommended that researchers include a wide range of predictors when attempting to understand survivor outcomes. It is often falsely assumed that individuals who are directly exposed to traumatic events are inevitably at high risk of posttrauma difficulties or that individuals with low levels of exposure will not report distress. Individual differences, such as pretrauma psychopathology, may help researchers and clinicians better predict each survivor's level of risk for persisting symptomatology.

With these key findings in mind, a larger issue emerged from the reviewed literature. Overall, there is a dearth of information about mass shootings, particularly the impact of direct exposure, which has resulted in a lack of empirical evidence related to the mental health consequences of this type of incident. Few articles have been written, and these articles have examined a limited number of mass shootings and have focused mostly on PTSD. This chapter should serve as a call for additional research aimed at better understanding the effects of mass shootings on mental health and how to best support the survivors.

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Psychosocial Functioning Within Shooting-Affected Communities

Individual- and Community-Level Factors

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Recent research following mass shooting events has examined not only those individuals directly exposed to or affected by the violence (see Chapter 11), but also the impact of the shooting on the whole community. In addition, there is growing awareness that mass shooting events may not only affect individuals' levels of adjustment, but may also affect community identity, solidarity, and overall functioning. Indeed, it has been argued that events such as mass shootings are best thought of as communal traumas, leaving whole communities affected in their wake (Littleton, Grills-Taquechel, & Axsom, 2009; North & Pfefferbaum, 2002). As a result, it is imperative that both research and intervention focus on the whole community to adequately capture the impact of such events and develop programs to improve outcomes among all members of affected communities.

It is in this spirit that we review the literature regarding the impact of mass shootings on the community. In this chapter, we will first review literature regarding the prevalence of adjustment difficulties among individuals in mass-shooting-affected communities. Emerging research supports that a number of individuals with less severe or even no direct exposure to a mass shooting event may experience adjustment difficulties, including anxiety, depression, and posttraumatic stress disorder (PTSD) symptoms, and, further, that chronic adjustment difficulties can develop. Next, we will discuss predictors of adjustment difficulties following mass shootings including the role of preshooting vulnerability, shooting-related exposure and loss, appraisals of shooting-related threat, and postshooting experiences. Then, we will discuss the possibility that mass shooting events may represent opportunities for

positive changes in individuals' functioning. Finally, we will review research regarding how the community itself may be altered by a mass shooting including changes in community solidarity, identity, and sense of safety within the community.

Throughout this chapter we will primarily review research conducted following four mass shooting events. We chose to focus on these events as the preponderance of work on the broader impact of mass shootings has focused on these four incidents. Two of these mass shooting events, the Virginia Tech (VT) campus shooting and the Northern Illinois University (NIU) campus shooting, occurred on college campuses in the United States, and two occurred in Finland, one at a high school (i.e., Jokela shooting) and one on a college campus (i.e., Kauhajoki shooting). All four events involved a lone, well-armed gunman, resulted in multiple fatalities, and were perpetrated by a current or former student (i.e., member of the affected community).

The VT campus shooting occurred on April 16, 2007 and involved a currently enrolled student. The incident occurred over the course of several hours in two campus buildings; students were on lockdown on campus as well as in the small town where the campus was situated. The gunman first shot two people in a campus dormitory, and later entered a classroom building, chained the doors, and went through multiple classrooms firing upon students and faculty who were trapped inside, before finally taking his life. By the end of the incident, 32 individuals had been killed by the gunman and another 25 individuals were wounded, making it the most deadly mass shooting in U.S. history at that time (Associated Press, 2007; Littleton, Grills-Taquechel, & Axsom, 2009). The NIU campus shooting occurred on February 14, 2008 and involved a former student who opened fire on a class in a large lecture hall. Five students were killed in the shooting and an additional 21 individuals were wounded before the shooter took his life. The entire campus was placed on lockdown during the shooting event (CNN, 2008; Miron, Orcutt, & Kumpala, 2014). The Jokela high school shooting in Finland occurred on November 7, 2007 and involved a current student who shot and killed six students as well as the school nurse and principal. During the incident, students and staff were barricaded in classrooms for several hours while the gunman roamed the school building and attempted to set the school on fire; he later took his own life. The incident marked the first mass shooting in Finland (CNN, 2007; Nurmi, 2012). The Kauhajoki shooting took place on September 23, 2008 at Seinäjoki University and involved a current student who entered a classroom building and shot his classmates, killing nine students and a faculty member and wounding two other individuals. During the shooting incident, he also set multiple fires on campus and was at large for several hours after the campus was evacuated before taking his own life (Associated Press, 2009; Nurmi, 2012).

Prevalence of Adjustment Problems in Mass Shooting-Affected Communities

Historically, research on adjustment following mass shooting incidents had focused on those individuals directly exposed (e.g., Norris, 2007). In contrast, more recent research has documented the existence of adjustment difficulties among individuals throughout the affected community. Much of this work has evaluated immediate and distal PTSD symptoms and probable PTSD diagnoses among affected individuals. This research has supported that a sizable percentage of individuals in shooting-affected communities experience PTSD symptoms in the near term. For example, Suomalainen, Haravuori, Berg, Kiviruusu, and Marttunen (2011) conducted a study of 231 students attending Jokela High School at the time of the shooting, finding that 53% of female students and 28% of male students reported PTSD symptoms 4 months after the shooting. In addition, 27% of female students and 7% of male students endorsed sufficient symptoms to support a probable PTSD diagnosis. Similarly, in a representative sample of 4,639 VT students who were assessed 3 months postshooting, 23.2% of women and 9.9% of men met criteria for probable PTSD (Hughes et al., 2011). Orcutt and colleagues were conducting a longitudinal study of sexual victimization among women at NIU at the time of the campus shooting and followed these women over the course of 3 years postshooting primarily via online surveys, with the first survey administered within 3 weeks of the shooting incident (Orcutt, Bonanno, Hannan, & Miron, 2014). Of the 812 eligible women, 691 completed the initial near-term postshooting survey with 42% reporting symptoms consistent with a probable diagnosis of PTSD (Miron et al., 2014). Similarly, in a sample of 36 individuals indirectly exposed to a mass shooting in a high-rise office building in San Francisco (e.g., in the building at the time of the shooting, saw SWAT team responding to the shooting), 33% met the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) criteria for acute stress disorder 8 days postshooting (Classen, Koopman, Hales, & Spiegel, 1998).

Research regarding the extent to which PTSD symptoms persist in the longer term postshooting is mixed. In their study of NIU women, Miron and colleagues (2014) found that 11.9% of women reported symptoms consistent with a diagnosis of probable PTSD at 8 months postshooting (as compared to the 42% who reported symptoms in the first several weeks postshooting). Additionally, when they examined PTSD symptom trajectories 3 years postshooting, they found that 8.2% of individuals exhibited a symptom pattern of persistent moderate PTSD symptoms and 1.8% displayed a symptom pattern of persistent severe PTSD symptoms (Orcutt et al., 2014). Like Orcutt and colleagues, Littleton and colleagues were conducting a study of the impact of sexual victimization on college women's adjustment at the time of the VT campus shooting, and followed these women via online surveys at 2 months, 6 months, and 1 year postshooting, with a total of 363 of the original 843 women completing at least

one of the postshooting surveys (Littleton, Axsom, & Grills-Taquechel, 2011; Orcutt & Littleton, 2010). In their study, persistent elevations in PTSD symptoms were more common, with 28% of women experiencing probable shooting-related PTSD at 2 months postshooting, 23% at 6 months, and 27% at 1 year postshooting (Littleton, Axsom, & Grills-Taquechel, 2011).

In contrast to the findings supporting that PTSD symptoms are elevated in the near term postshooting and remain elevated for a percentage of individuals in the long term, extant research supports that general anxiety and depression symptoms are unlikely to increase for most in the near term. For example, in the previously mentioned sample of 368 VT women, Littleton, Axsom, and Grills-Taquechel (2011) identified that 19% of the sample met the criteria for probable depression 2 months postshooting. The prevalence of depression rose at 6 months to 22% and rose again at 1 year postshooting, with 24% endorsing probable depression. However, the overall prevalence of depression across assessments was similar to the level of preshooting depression. There also were few overall changes in general anxiety symptoms at 2 months and 6 months postshooting (Grills-Taquechel, Littleton, & Axsom, 2011). However, it should be noted that a more recent analysis of symptom trajectories over time in this sample found that while the majority of participants did not experience increased symptoms postshooting, 23% experienced a sharp increase in anxiety at 2 months postshooting, with this group continuing to display elevated anxiety at 1 year postshooting. With regards to depression trajectories, 13% experienced a sharp increase in depression after the shooting, although their overall depression symptoms decreased by 1 year postshooting. In addition, another 10% showed delayed stress reactions, initially reporting modest depression postshooting which then increased at 6 months postshooting and continued to increase at 1 year postshooting (Mancini, Littleton, & Grills, 2016).

Thus, overall research on postshooting adjustment among members of affected communities supports that PTSD symptoms are a common response in the near term and a portion of affected individuals will experience significant PTSD symptoms in the longer term, although how frequently such symptoms persist may vary. In contrast, most individuals do not experience significant increases in depression and general anxiety, although some individuals do appear to develop increased symptoms, with a minority of these individuals developing persistent distress or experiencing delayed stress reactions.

Predictors of Adjustment Problems Among Individuals Affected by a Mass Shooting

Given that a number of individuals within communities affected by mass shootings will experience short-term and persistent adjustment difficulties, it is imperative to understand the factors that are associated with adjustment

problems among these individuals. Research investigating such predictors has elucidated the potential role of preshooting vulnerability factors, shooting-related exposure and loss, shooting-related appraisals of threat, as well as a number of postshooting factors in predicting adjustment both in the immediate aftermath of the shooting as well as longer term. Additionally, several studies have included both prospective and longitudinal designs, as well as been informed by theoretical models developed for understanding adjustment following highly stressful and traumatic events.

Several studies have supported the role of pretrauma vulnerability factors in influencing adjustment following mass shootings. For example in Littleton and colleagues' research following the VT campus shooting, both preshooting psychological distress (i.e., depression and anxiety symptoms) and preshooting social support were related to worse adjustment postshooting both in the near and longer term. Further, preshooting distress and social support were related to both postshooting general distress and shooting-related PTSD symptoms. However, it should be noted that, in general, the size of these relationships was in the small to medium-sized range (Grills-Taquechel et al., 2011; Littleton, Axsom, & Grills-Taquechel, 2009; Littleton, Grills-Taquechel, & Axsom, 2009). Finally, while having a history of sexual trauma prior to the shooting was unrelated to adjustment both prior to the shooting and in the near term, women with sexual trauma histories reported significantly higher levels of both depression symptoms and shooting-related PTSD symptoms at 1 year postshooting (Littleton, Grills-Taquechel, Axsom, Bye, & Buck, 2012). Similarly, in Orcutt and colleagues' longitudinal study of women affected by the NIU campus shooting, preshooting general distress, PTSD symptomology, and severity of prior trauma exposure all predicted immediate postshooting PTSD. In contrast, only severity of preshooting trauma exposure predicted persistence of PTSD at 8 months postshooting (Miron et al., 2014).

Several studies have also investigated the impact of level of shooting exposure on adjustment. In general, results have found that exposure is related to adjustment among those with the highest levels of direct exposure. For example, in a linear growth mixture model study of women's PTSD symptoms over the course of 3 years following the NIU shooting, Orcutt and colleagues (2014) found that those who evidenced a pattern of resiliency were less likely to report severe direct exposure to the shooting, such as seeing the gunman fire on someone, than individuals who demonstrated either a pattern of shooting-related distress followed by recovery or chronic shooting-related PTSD symptomology. Additionally, shooting-related exposure was related to risk for persistent PTSD at 8 months postshooting (Miron et al., 2014). Similarly, Suomalainen and colleagues (2011) in their study of students attending Jokela High School at the time of the shooting found that students who reported the highest level of exposure to the shooting (e.g., students who reported their life was in danger, saw the gunman fire on someone) were more likely to report

clinically elevated PTSD symptoms. Additionally, Hughes and colleagues (2011) found in their representative sample of over 4,000 VT students that direct exposure to the shooting (e.g., seeing fleeing students) was associated with an odds ratio of between 1.4 and 1.7 of reporting elevated shooting-related PTSD symptoms. In contrast, Littleton and colleagues found that exposure was generally only weakly related to postshooting adjustment, although it should be noted that their sample of VT women did not include individuals with more severe direct exposure to the shooting (Grills-Taquechel et al., 2011; Littleton, Axson, & Grills-Taquechel, 2009).

Additionally, loss of a loved one in the shooting (e.g., friend, significant other) has been found to be related to postshooting adjustment in some investigations, but not others. Hughes and colleagues (2011) found that loss of someone close in the shooting was associated with an odds ratio of 3.6 for experiencing elevated PTSD symptoms, and loss of a friend or acquaintance was associated with an odds ratio of 1.9 for risk for PTSD among VT students. In contrast, Littleton, Axson, and Grills-Taquechel (2009) found that reported loss of a friend in the VT shooting was unrelated to any postshooting adjustment variable. Hughes and colleagues (2011) noted that in their sample, a very high percentage of individuals reported that they were close to a victim as compared to the percentage of the student body killed (9.1% of participants reported being close to someone killed whereas only 0.4% of the students were killed). Littleton, Axson, and Grills-Taquechel (2011) similarly found that nearly 30% of participants reported that they lost a friend in the VT shooting incident. Hughes and colleagues (2011) speculated that the shared experience of the campus shooting served to increase perceived closeness to the victims. However, it also seems plausible that the experience of heightened distress following the shooting could have served to increase students' perceptions of personal loss due to the shooting and thus increased perceived closeness to the victims.

In contrast to the somewhat mixed findings for more objective measures of shooting-related exposure and loss, subjective appraisal of threat or danger to oneself or loved ones has been associated with adjustment difficulties postshooting. For example, Hughes and colleagues (2011) found that a reported inability to get in touch with friends during the VT shooting incident was associated with a 2.5 increased odds of experiencing elevated PTSD symptoms 4 months postshooting. Similarly, in a linear growth mixture modeling analysis of women's anxiety symptoms in the year following the VT shooting, Mancini and colleagues (2016) found that women who demonstrated a pattern of persistent distress (i.e., continued elevated anxiety symptoms over 1 year) following the shooting were more likely than women demonstrating a resilient trajectory to report that they believed their own life and/or that of their friends and loved ones were in danger during the shooting. Finally, Miron and colleagues (2014) found that women's reports of dissociative symptoms during

the NIU shooting predicted both immediate postshooting PTSD symptoms and persistence of PTSD symptom at 8 months postshooting.

Several studies have also examined the relationship of postshooting factors to adjustment postshooting, often drawing on extant theoretical models of adjustment following stressful or traumatic experiences. One such theoretical model that has been applied to explain postshooting adjustment is the conservation of resources (COR) model (Hobfoll & Lilly, 1993). Briefly, this theory posits that highly stressful events are likely to have an impact on functioning to the extent to which such events are associated with loss of valued resources, which is defined as “objects, personal characteristics, conditions, or energies that are valued in their own right, or that are valued because they act as conduits to the achievement or protection of valued resources” (Hobfoll, 2001, p. 339). Loss of resources is posited to be particularly detrimental to adjustment both because individuals must invest further resources to regain what is lost and because initial loss increases vulnerability to further loss (Hobfoll & Lilly, 1993). Although a mass shooting may not result in tangible losses for most indirectly exposed individuals, individuals may still be vulnerable to loss of intrapersonal (e.g., sense of life direction, optimism) and interpersonal (e.g., intimacy with loved ones) resources. Supporting this model’s assertions, Littleton and colleagues found that women who reported loss of intra- and interpersonal resources in the immediate aftermath of the VT shooting experienced more PTSD symptoms and general distress 6 months postshooting (Littleton, Axsom, & Grills-Taquechel, 2009; Littleton, Grills-Taquechel, Axsom, 2009). Further, lower social support and greater psychological distress preshooting predicted postshooting resource loss, suggesting that such individuals may be more vulnerable to resource loss. Finally, participants’ initial resource loss postshooting significantly predicted their reports of further resource loss 6 months postshooting, supporting the supposition that initial loss increases risk for future resource loss. Similarly, among women exposed to the NIU shooting, Littleton, Kumpula, and Orcutt (2011) found that initial postshooting resource loss predicted PTSD symptoms at 8 months postshooting after controlling for demographics, preshooting trauma history, shooting exposure, and initial postshooting distress and PTSD symptoms.

Another posttrauma variable that has been examined is individuals’ coping behaviors. Littleton, Axsom, and Grills-Taquechel (2011) examined the relationship between both general distress and PTSD in association with women’s shooting-related coping strategies following the VT shooting. Specifically, using structural cross-lagged regression, they examined the relationship between postshooting adjustment and use of shooting-related avoidance coping over 1 year. In this study, they drew on Snyder and Pulvers’ (2001) model of coping with stressful events which posits that individuals rely on avoidant coping strategies, such as engaging in emotional and behavioral avoidance and withdrawing from others, when they appraise a stressful event as exceeding

their coping resources. Reliance on these strategies is then posited to lead to a number of negative outcomes over time including persistent distress, rumination about the stressor and one's inability to manage it, and eventual demoralization (Snyder & Pulvers, 2001). The results supported that both shooting-related PTSD and general distress (i.e., depression and anxiety symptoms) predicted avoidance coping. Shooting-related coping in turn predicted general distress at 1 year postshooting, but not 1 year postshooting PTSD symptoms. They posited that avoidance coping may be particularly predictive of the demoralization and depression that occurs over time in individuals experiencing PTSD, rather than directly fueling PTSD symptomology. In contrast, the reexperiencing and arousal symptoms of PTSD may lead to continued appraisals that one is unable to manage one's trauma-related distress and thus result in continued reliance on avoidance coping (Littleton, Axsom, & Grills-Taquechel, 2011).

In a similar vein, Orcutt and colleagues examined the role of difficulties with engaging in strategies to manage negative emotions more generally as a predictor of adjustment following the NIU shooting (Bardeen, Kumpala, & Orcutt, 2013). Using a cross-lagged panel design, they found that pre-shooting PTSD symptomology predicted immediate postshooting emotion regulation difficulties. Further, immediate postshooting emotion regulation difficulties predicted PTSD symptoms 8 months postshooting, although immediate postshooting PTSD symptoms did not predict emotion regulation difficulties at 8 months. For general distress, a similar pattern emerged with the exception that pre-shooting emotion regulation difficulties did not predict immediate postshooting general distress (Bardeen et al., 2013). In interpreting these findings, they argued that pretrauma emotion regulation difficulties may have led to more threatening appraisals of the shooting, as well as more negative appraisals of one's coping resources, which led to a reliance on avoidance coping strategies to manage the shooting (Bardeen et al., 2013). The fact that emotion regulation difficulties predicted general distress in the longer term is also consistent with the notion that reliance on ineffective avoidance coping leads to demoralization and depression over time.

Two longitudinal investigations following the VT shooting also supported the importance of disruptions in worldview after the shooting as a predictor of adjustment difficulties. These studies drew from the shattered assumptions framework of Janoff-Bulman (1989) who theorized that traumatic events threaten individuals' basic beliefs about themselves and the world (e.g., the extent to which people and the world are seen as benevolent and good, the extent to which the self has value). Further, she and others argue that being able to successfully reconcile this threat is necessary for positive posttrauma adjustment (Janoff-Bulman, 1989; Resick & Schnicke, 1992). Supporting this framework, Smith, Abeyta, Hughes, and Jones (2015) found that students' appraisals that the

shooting had a negative impact on their personal worldview predicted severity of grief symptoms at 1 year postshooting among those who had lost a close friend in the shooting. Further, experiencing increased PTSD symptoms at 3 months postshooting predicted disruptions in worldview 1 year postshooting. Smith and colleagues (2015) argued that their findings supported the idea that PTSD symptoms may interfere with adaptive coping and cognitive processing of a traumatic experience via multiple routes, including undermining coping self-efficacy. Indeed, coping self-efficacy at 3 months postshooting also predicted perceived disruptions in worldview at 1 year postshooting (Smith et al., 2015). Additionally, Littleton and colleagues (2012) found that less belief in benevolence at 2 months postshooting mediated the relationship between having a sexual trauma history and experiencing shooting-related PTSD and general distress at 1 year. They posited that it is the challenge to one's worldview and resources presented by multiple traumatic experiences (i.e., experiencing childhood sexual abuse and/or rape as well as the shooting) which enhance vulnerability to worse adjustment outcomes following multiple traumas, as opposed to viewing these adjustment differences as the result of a simple accumulation of symptoms (Littleton et al., 2012). Indeed, women with sexual trauma histories reported similar levels of PTSD and depression symptoms as women without such histories at 2 months postshooting, whereas at 1 year postshooting the PTSD symptoms of sexual trauma victims remained elevated and their depressive symptoms increased, while both types of symptoms decreased for women without sexual trauma histories (Littleton et al., 2012).

Finally, research following the VT, NIU, and the Jokela high school shootings confirm the importance of social support, particularly from family, in predicting postshooting adjustment (Grills-Tauechel et al., 2011; Miron et al., 2014; Suomalainen et al., 2011). Additionally, as mentioned previously, Littleton, Axsom, and Grills-Tauechel (2009) found that preshooting social support was predictive of lower levels of resource loss postshooting, suggesting that one way social support may relate to adjustment is in protecting individuals from such loss. This is consistent with models emphasizing social support's role in promoting subjective wellbeing and adaptive coping, which could then serve to reduce risk for resource loss (Cohen & Wills, 1985; Flannery, 1990; Littleton, 2010). The finding regarding the importance of family support in promoting better adjustment (e.g., Grills-Tauechel et al., 2011; Suomalainen et al., 2011) could in part reflect the developmental level of the individuals exposed (i.e., high school students and primarily freshman college students). Additionally, family support may have been particularly important because students' family members were likely not directly affected by the shootings in the same way as participants' other sources of support, such as their friends, who likely also attended the same school or university (Grills-Tauechel et al., 2011).

Improvements in Adjustment Following a Mass Shooting

Interestingly, a more recent analysis of adjustment trajectories among VT women conducted by Mancini and colleagues (2016) found that, for some individuals, rather than leading to increased adjustment difficulties, a mass shooting incident may instead lead to improvements in individuals' adjustment, likely due in part to the outpouring of social support and increased community solidarity that can accompany such events. Specifically, in their linear growth mixture modeling study of adjustment patterns 1 year post-shooting, they identified a group of approximately 7 to 13% of women who reported *elevated* distress *prior* to the shooting who then experienced improvements in their depression and anxiety symptoms from pre- to postshooting, with a pattern of increasing improvement in symptoms from 2 months to 1 year postshooting. Suggesting that social support and solidarity promote such improvements, those who experienced symptom improvements reported a large and significant increase in social support postshooting when compared to individuals' whose social support did not change or only slightly increased. Similarly, they reported more gains in interpersonal resources at each post-shooting assessment than all other groups. They hypothesized that for some individuals who were experiencing psychological distress prior to the shooting the incident represented an opportunity to utilize resources/experiences available (e.g., that of a shared painful experience, mutual helping behaviors among community members) to reduce their own distress and enhance their wellbeing (Mancini et al., 2016). Thus, this adjustment pattern was distinct from resilience (i.e., individuals who are not distressed prior to a traumatic event and maintain their positive adjustment) and posttraumatic growth (i.e., individuals who experience perceived growth/gains after experiencing increased distress/struggle after a trauma).

Broader Community Changes Following a Mass Shooting

As alluded to in the previous section, mass shootings may also lead to community-level changes in multiple domains. Most of the research examining these processes has focused on changes in social solidarity following shooting events, including the positive and negative consequences of these changes. Some studies have also examined influences on, and the impact of, alterations to the community's identity now that it is linked to a mass shooting event. Finally, a few studies have examined influences on community perceptions of safety following the shooting.

Following a mass shooting event, there frequently is an increase in social solidarity within the affected community. Social solidarity has been defined as “a positive way of relating to others in interaction, or as feelings of togetherness and responsibility for others” and as “a broad conception underlining mutual social support and sense of community” (Nurmi, Räsänen, & Oksanen, 2011, p. 303). The idea that social solidarity increases after a community tragedy is not new; indeed, the origins of this idea can be traced back to Émile Durkheim (1893), who first suggested that following a crime, especially a shocking or particularly violent crime, the collective community comes together to reestablish and reinforce the community norms that have been violated (Räsänen, Hawdon, Näsi, & Oksanen, 2014). Since that early observation, multiple studies have documented this rise in solidarity following community-level traumatic events, such as natural disasters, terrorist attacks, and mass shootings (Kaniasty & Norris, 2004).

This increase in social solidarity among affected communities can be enormously beneficial following a tragedy, such as a mass shooting, as it provides increased social support, tangible resources, and optimism to a community in need. Indeed, researchers investigating the effects of three mass shootings – the two school shootings in Finland as well as a 2007 mall shooting in Nebraska where eight individuals were killed and three were injured – found that stronger perceptions of social solidarity in the community were associated with increased emotional wellbeing and decreased depressive symptoms both immediately after the shooting and 13 and 18 months later (Hawdon, Räsänen, Oksanen, & Ryan, 2012). Researchers in this study also measured and controlled for individuals’ perceived levels of general support (e.g., support from friends, family) and were thus able to identify a unique contribution of perceived social solidarity over and above general social support.

Although there are clear and undeniable benefits to the rise in social solidarity after a mass shooting, researchers have also documented a “dark side of solidarity” (Hawdon et al., 2012, p. 5). Specifically, community members may feel pressure to participate in shared mourning and collective expressions of unity, even if they themselves are experiencing different emotional reactions (Nurmi et al., 2011). Individuals who perceive themselves as coping differently than the “norm” may experience feelings of guilt and isolation that they are not feeling what social messages say they “should” be feeling. Similarly, members of the community may differ in how they define and think about the shooting incident. As time passes, differences in readiness to “move on” from the shooting may create tensions among members of the community. Nurmi and colleagues (2011) observed that this was the case in the Jokela community after the mass shooting. Kaniasty and Norris (2004) agree that “People’s needs, wishes, and their ways of coping [after a mass trauma] may collide and augment the experience of stress” (p. 206). Additionally, some affected communities may develop a feeling of “us against them,” where they

view outsiders with distrust and suspicion, and believe that those who are not members of the community will be unable to understand what they are feeling or what they need (Nurmi et al., 2011).

Within the community, tensions may also exist between those who were directly affected (e.g., observed the shooting, lost a loved one) and those who were more indirectly affected (Nurmi et al., 2011). Conflict may arise in cases where lawsuits are brought against an organization following the shooting, such as in the case of the VT shooting (du Lac, 2013). Aside from the obvious division of those involved or not involved in the lawsuit, some community members may feel that legal action is justified while others may view it as inappropriate or capitalizing on tragedy (Kelly, 2014). Similarly, members of the community may experience conflict regarding distribution of resources allocated to aid community recovery. As an example, in the months after the VT shooting, approximately \$7 million was donated to the Hokie Spirit Memorial Fund (Hincker, 2007). Disagreements as to the most appropriate means of distributing this money (e.g., directly to victims' families, to university scholarships/endowments, to campus preparedness and emergency alarm system) eventually led to the appointment of Kenneth Feinberg, the Special Master of the federal September 11th Victim Compensation Fund, to manage distribution of the funds (Hincker, 2007). Kaniasty and Norris (2004) observe that inequitable distribution of resources following a disaster or community tragedy is one of the quickest ways for a community to lose its high postdisaster solidarity and subsequently turn to conflict. All of these different frictions and tensions – differing emotional reactions, readiness to move on, definitions of the trauma, levels of exposure to the shooting, beliefs about ongoing litigation, and views about the allocation of resources – have the potential to develop into conflict and division as members of the community attempt to heal from the shooting. Thus, initial solidarity may be short-lived and instead greater divisions may occur among community members over time.

Indeed, it is likely inevitable that the increase in the social solidarity that occurs in a community following a mass shooting will decline. It has been theorized that in general social solidarity peaks immediately after a shooting. It remains elevated for approximately six months postshooting and then gradually returns to preshooting levels (Räsänen et al., 2014). This gradual withdrawal of social support and resources can feel like a betrayal to members of the community who still perceive a need for help, and can counteract some of the positive benefits of receiving the social support in the first place. This surge and subsequent decline of social support and solidarity is delineated in the social support deterioration deterrence (SSDD) model and has been applied to a variety of disasters (Kaniasty & Norris, 2004). However, initial high levels of support and assistance following a tragedy can serve a protective role against the subsequent decline in social support, resulting in the eventual social support

disruptions having a less severe impact on wellbeing if it is preceded by high helping and solidarity (Kaniasty & Norris, 2004).

Another way mass shootings can influence communities is through the effect on the community's collective identity. For better or worse, after such a violent and salient tragedy, community names often become synonymous with the shooting. Thus, in many cases, the community's identity becomes indelibly linked with the tragedy that occurred there. In some cases this altered identity can be embraced as part of the increase in social solidarity following a shooting, as in the case of the "Today, we are all Hokies" (i.e., expressing solidarity through identifying with Virginia Tech's mascot, the Hokie bird) phrase that was frequently used following the VT shooting (e.g., Grossman, 2007). In these cases, the altered communal identity can be seen as a source of strength, resilience, and optimism in overcoming a tragedy. In fact, admission applications to Virginia Tech were higher in the year after the shooting than the previous year and have remained high since the shooting (Johnson, 2011), suggesting that Virginia Tech's identity was not harmed by the tragedy, but rather the shooting event was incorporated as something they had overcome as a community. Alternatively, the association with a mass shooting event can become a source of shame and guilt for these communities. In the case of the Jokela school shooting, community members reported feeling stigmatized by their association with Jokela and embarrassed to tell outsiders where they resided (Nurmi et al., 2011). In extensive interviews with community leaders in Jokela, these leaders reported concerns that outsiders would not be able to understand their experiences. In fact, they noted that fewer Jokela youth left the community to attend vocational or high school in the year after the shooting, and indicated this may be evidence of members of the community isolating themselves and withdrawing from outsiders (Nurmi et al., 2011). Whether community identity is altered in a positive or stigmatized manner likely depends on many different factors, including preexisting characteristics (e.g., closeness of the community, size, geographic isolation), characteristics of the shooting, posttrauma factors (e.g., portrayal of the event and community by the media; see Chapter 7), political response, and other external influences (Nurmi, 2012). Demonstrating how these processes can occur, Nurmi (2012) identified that in the case of the two school shootings in Finland, one community (Jokela) was characterized as a victim of the tragedy and received an outpouring of support and solidarity, while the other community (Kauhajoki) was characterized as simply a site where a tragedy took place. Before the shooting, Jokela was described as "a close-knit community, both geographically and socially" (Nurmi, 2012, p. 17), but warm and inclusive of new people. Conversely, Kauhajoki was described as larger, more isolated, with a strong regional identity, and more distrustful of outsiders. The shooter in Jokela was a youth from that town, and his victims were similarly locals; however, in Kauhajoki the shooter was an "outsider" who moved there to attend

the university, and many of his victims were also originally from elsewhere (Vuori, Hawdon, Atte, & Räsänen, 2013). The preexisting differences and characteristics of the shooting events, as well as factors such as media portrayal and timing (with Jokela representing the first school shooting in Finland's history), may have contributed to differential effects on community identity following these shootings.

Additionally, for some communities, feelings of collective guilt may arise due to beliefs that the community should have somehow predicted and intervened to avert the shooting. For example, one leader of the Jokela community commented after the shooting, "A lot of times when something like this happens, people want to find out whose fault it is. So maybe it's a kind of ... shared feeling of guilt" (Nurmi et al., 2011, p. 314). School shootings in particular lead to this type of questioning and either direct or indirect attributions of blame, as the shooter is often a member of the community and thus the violence appears to emerge from and occur within the community. Kaniasty and Norris (2004) point out that "To protect their own conceptions of justice and deservingness, people may stigmatize and reject the victims both as individuals and as a collective" (p. 217). In these ways, members of the affected community may experience blame and stigmatization following a mass shooting that could become incorporated into their new postshooting collective identity.

One of the most visible changes to a community following a mass shooting, which may in part emerge from concerns about the community's inability to prevent the shooting, is a change in security protocols, reflecting altered perceptions of safety within the community. After such a tragedy, communities tend to react by implementing new policies and procedures designed to increase safety and prevent future similar crimes. After the VT shooting, for example, the university spent approximately \$11.4 million in safety and security updates, such as an increased police force and new alarm systems (Johnson, 2012). These increased security measures are likely reflective of a desire of community members to increase feelings of safety following the violation of safety assumptions inherent in a mass shooting event. Interestingly, one study examined the effects of social solidarity on safety concerns – specifically fear of a future shooting – following the Finland school shootings, and found a significant negative relationship between perceptions of social solidarity and fear of a shooting reoccurrence; that is, perceptions of solidarity were protective against fears of another shooting occurring (Räsänen et al., 2014). However, this relationship was no longer significant at 18 months postshooting, suggesting that this relationship declines over time, likely related to the decrease in social solidarity. Solidarity may be protective against loss of safety perception because individuals who have high trust in their neighbors and their community may be less likely to believe that another terrible crime can occur there, or to believe that a member of their community could perpetrate such an act. Alternatively, if individuals have strong feelings of trust and

unity in their community, they may not believe that the shooter's mentality was the fault of the community, and thus may not feel that their community is at risk of reoccurrence. This high solidarity may also serve as a reminder of all of the positive aspects of their community, helping them to preserve their preshooting view.

Another study of individuals following the shootings in Finland found that the reverse appears to be true as well; just as strong solidarity predicts low fear of a shooting reoccurrence, community fear of another school shooting weakened perceived solidarity in the community (Hawdon, Räsänen, Oksanen, & Vuori, 2014). However, this effect was only found in Jokela, and not in Kauhajoki. Researchers hypothesized this might be because the citizens of Jokela identified more strongly with the shooting incident since the shooter was a member of their own community, and thus there was more fear that another shooting would indicate that something must be seriously wrong with the community. However, after the second shooting in Kauhajoki, school shootings were considered a national problem in Finland, and so there was less focus on Kauhajoki as giving rise to the shooter's behaviors (Hawdon et al., 2014). Thus, it is clear that a shooting event can have a significant impact on the affected community in multiple areas of functioning, with a mix of potential positive and negative outcomes.

Conclusions

To conclude, a growing body of literature supports that a sizable percentage of individuals in mass shooting affected communities will experience distress including PTSD symptoms in the immediate aftermath. For a portion of these individuals, these adjustment problems will persist and can be accompanied by other forms of distress, such as depressive symptomology. Not surprisingly, persistent adjustment problems are predicted by the interaction of preshooting vulnerability factors, shooting-related exposure, appraisals of the shooting event, and postshooting experiences. In addition to affecting individual adjustment, the occurrence of a shooting event can lead to community-level changes including increased social solidarity, changes in community identity, and changes in perceptions of safety within the community. Finally, for at least some individuals the positive community changes that occur in the immediate aftermath of a mass shooting can represent an opportunity for improvement in adjustment.

Given the unfortunate reality that mass shooting events are likely to continue to occur in our society, there is a need to utilize this information to more comprehensively intervene in affected communities. This includes intervention at the individual level with those at risk for, or experiencing, persistent distress (see Chapter 15), as well as at the community level to promote adaptive

solidarity and positive community identity (see Chapter 16). Work in these areas is necessary to improve individual and community resilience and recovery following such tragedies.

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Postdisaster Psychopathology Among Rescue Workers Responding to Multiple-Shooting Incidents

Geoff J. May and Carol S. North

Despite some evidence to suggest that the prevalence of multiple shootings in the United States may be increasing (Ali & North, 2016), little is yet known about the psychological health of rescue workers after such disasters. Rescue workers called to respond to these events may include police, security guards, emergency medical service (EMS) workers, and firefighters. Police may be especially prone to trauma exposure in response to mass shooting scenarios because they may be endangered by gunfire aimed at them by the shooter(s).

Only one study has focused on professional responders to mass shooting incidents. This study used the Impact of Event Scale to collect self-report posttraumatic symptom data in 140 police, fire, medical, and mental health responders to a mass shooting at an elementary school (Sloan, Rozensky, Kaplan, & Saunders, 1994). The responder groups did not differ from one another in numbers of reported symptoms. A greater number of hours worked was significantly associated with higher intrusion and avoidance scores immediately after the disaster, and these relationships persisted 6 months later. Time pressure to perform duties was associated with avoidance but not intrusion scores at baseline, but these relationships were no longer present at 6 months. No other predictors of posttraumatic stress symptoms at baseline or follow-up were found.

No known published studies specifically focused on rescue workers responding to mass shootings have provided data based on full diagnostic assessments of psychiatric disorders. Although not exclusively focused on rescue workers, North and colleagues did include first responders in some of their research following four shooting incidents and collected full diagnostic data from their participants (See North & King, 2009). Survivors who were not rescue workers,

will be referred to as “civilians” in this chapter. Soon after these incidents, 19% of the survivors in the combined sample obtained from the four studies, which included first responders and civilians, were diagnosed with posttraumatic stress disorder (PTSD) related to the shooting, and 32% had a postdisaster psychiatric disorder. At 3 years the proportion with current shooting-related PTSD had dropped to 12%, and only 23% had any current psychiatric disorder. Although rescue workers were included in two of these four studies, their data were not presented separately from the civilians of the disasters, who represented the majority of the samples (North, McCutcheon, Spitznagel, & Smith, 2002; North, Smith, & Spitznagel, 1994, 1997).

Because no other data from studies focusing on rescue workers responding to shooting incidents are available in the published literature, additional inferences can only be drawn from a review of the literature on rescue workers responding to other types of incidents, rescue workers studied without reference to a specific incident, and comparative studies of different types of rescue workers in a variety of situations. Studies of rescue workers responding to mass casualty incidents have generally investigated other types of disasters such as terrorist attacks, earthquakes, and hurricanes. Although it has been posited that man-made disasters and particularly intentionally caused incidents, such as mass shootings, may lead to worse mental health consequences than natural disasters (Norris et al., 2002), research on disaster survivors by North and colleagues found that when the analysis controlled for magnitude of the disaster (i.e., number of fatalities), disaster-related PTSD prevalence was not associated with disaster type (North, Oliver, & Pandya, 2012).

Some studies have compared postdisaster psychopathology among different types of rescue workers. A study of rescue and recovery workers who assisted at the World Trade Center disaster site after the September 11, 2001 (9/11) attacks in New York City used the PTSD Symptom Checklist to approximate diagnostic criteria for PTSD. The prevalence of “probable” PTSD identified by this method was significantly lower in police (8%) compared to firefighters (14%) and EMS personnel (17%; Perrin et al., 2007). Few studies other than those investigating the 9/11 attacks have compared different types of rescue/recovery workers in response to the same disaster because most disasters (e.g., fires, mass shootings, structural collapses) historically have attracted predominantly one type of responder.

An exceptionally large meta-analysis by Norris et al. (2002) concluded that disaster rescue and recovery workers demonstrated greater “remarkable resilience” compared to other disaster survivors (p. 207). A diagnostic study using a fully structured diagnostic interview (i.e., Diagnostic Interview Schedule) that examined male firefighters who served as rescue and recovery workers in the Oklahoma City bombing found disaster-related PTSD in 13%. The incidence of PTSD in the firefighters and the level of functional impairment was significantly lower than in directly exposed male bombing survivors

(23%; North, Tivis, McMillen, Pfefferbaum, Cox, et al., 2002). The firefighters had a higher postdisaster prevalence of alcohol use disorder (24%) compared to civilians, but almost all of this difference could be attributed to preexisting disorders (47%); that is to say, there was almost no incident alcohol use disorder following the disaster (North, Tivis, McMillen, Pfefferbaum, Cox, et al., 2002). The firefighter responders who screened positive for alcohol use disorder had lower levels of functioning compared to their colleagues (North, Tivis, McMillen, Pfefferbaum, Spitznagel, et al., 2002). Vanishingly few studies of rescue workers in any type of disaster have used a full diagnostic assessment interview of postdisaster psychiatric disorders. The importance of using diagnostic instruments rather than symptom scales is demonstrated in one multiple-shooting study using a structured diagnostic interview that found an abundance of posttraumatic stress symptoms but very few individuals with PTSD (Johnson, North, & Smith, 2002).

Studies of rescue workers not selected based on their response to a disaster have examined prevalence rates of psychopathology. A comprehensive systematic review of 28 studies reporting on 40 samples with a total of 20,424 rescue workers with diverse trauma response histories using many different PTSD measures (Berger et al., 2012) found the current prevalence of PTSD to be 10%. Conversely, PTSD prevalence in those with a history of response to a natural disaster was 17%, which was not significantly different from the rate of those with no disaster response history ($p = .07$). However, ambulance personnel had significantly greater PTSD (15%) compared to major disaster responders who were firefighters (7%) or police (5%; $p = .04$ in both comparisons).

One study examined Canadian police officers selected not for disaster response but for experience of a trauma sustained in the routine course of duty. Using a structured diagnostic interview (i.e., Clinician Administered PTSD Scale), this study found that 7% of trauma-exposed officers had developed PTSD in relation to the event they identified as the most traumatic (Martin, Marchand, & Boyer, 2009). Another study of police officers found that most had been exposed to duty-related trauma; using a symptom measure to assess PTSD, this study found a 6% prevalence within 3 months of duty-related trauma exposure and a total of 7% by 12 months (Carlier, Lamberts, & Gersons, 1997). A prevalence study of German firefighters not selected relative to any particular incident found that 29% scored positive on a symptom screener for current alcohol problems (Boxer & Wild, 1993).

The above literature review demonstrates that very little study has been done to characterize postdisaster psychopathology among rescue workers responding to mass shooting incidents, although information from studies of broader populations is available. Extrapolation of findings from other studies that combine rescue workers with civilians, however, cannot explain how rescue workers might differ from civilians in their psychopathology related to exposure to mass

shooting incidents. Additionally, inconsistencies in the sampling of disaster workers, the types of disasters examined, assessment of trauma exposures, and measurement of psychopathology have further obfuscated attempts to understand disaster responder mental health. Findings from this broader body of work, however, faintly suggest that rescue workers may experience less PTSD than directly exposed disaster survivors, and that firefighter responders may have alcohol use disorders endemic within the profession that may be largely unrelated to disaster trauma exposures.

This review has demonstrated that little information is available from full diagnostic assessment data in studies of rescue workers specifically after mass shootings, and such studies are needed to understand the prevalence of disaster-related psychopathology in this population. To build on the reviewed literature, this article presents combined data from two studies of rescue workers responding to multiple-shooting incidents and civilians of these incidents using structured diagnostic instruments for assessment of psychiatric disorders in relation to the disasters. The consistent methods in the two studies permitted merging of the data for the analysis presented in this chapter.

Methods

The data for the current analyses were collected following two multiple-shooting incidents as part of two previous studies. The data were originally published without separate presentation of the findings from the rescue workers and civilians in the samples. One of the incidents was a cafeteria shooting in 1991 in Killeen, Texas that left 24 dead and another 20 injured (North et al., 1994). The other incident was a courthouse shooting in 1992 in Clayton, Missouri that resulted in one fatality and five injuries (Johnson et al., 2002). As a general principle in this book, a mass shooting is defined as one in which four or more people are killed, which fits the cafeteria incident in Killeen, but not the courthouse incident in Clayton. However, we feel the data are still relevant for the purposes of this chapter, particularly in light of the overall lack of prior research on this topic.

For the Killeen cafeteria massacre study, a systematic sample of directly exposed survivors was originally recruited from a list of all individuals who were present at the shooting, with an 82% participation rate, including a sample of 16 rescue workers and 107 civilians ($n=123$). For the Clayton courthouse study, a volunteer sample of directly exposed survivors was recruited, including 8 rescue workers and 71 civilians ($n=79$). All but two of the 24 total rescue workers in the combined sample from both incidents were male. Because it has been well documented that civilian women (Norris et al., 2002) as well as female police officers (Bowler et al., 2012) are more likely than their male counterparts to be emotionally affected by trauma, and because the rescue

workers in this study were almost all men, the sample for this analysis was restricted to men for adequate comparison of rescue workers with civilians. The final sample ($n=88$) for these analyses included a total of 22 male rescue workers and 66 male civilians (14 rescue workers and 46 civilians in Killeen, and 8 rescue workers and 20 civilians in Clayton).

Study participants were interviewed 6 to 8 weeks after the disaster, and follow-up interviews were conducted at approximately 1 year postdisaster, with a 93% follow-up participation rate. No differences in follow-up attrition were found between the rescue workers and the civilians.

All participants were interviewed using the Diagnostic Interview Schedule for DSM-III-R (DIS-III-R; Robins, Helzer, Cottler, & Goldring, 1989) and the Disaster Supplement (Robins & Smith, 1983). These interviews provided data on demographics, exposure to trauma in the disaster, personal perceptions of the disaster, role in the disaster (type of rescue worker, civilian), lifetime pre-disaster and postdisaster psychiatric disorders, and psychosocial interventions and treatment received.

Data are summarized and presented as counts, percentages, means, and standard deviations. Categorical variables were compared using Fisher's exact tests, and continuous variables were compared using Welch t tests.

Results

Table 13.1 lists the demographic characteristics of the combined sample at baseline. The sample consisted largely of nonminorities who were in their late thirties, with 2 years of college education. Almost all were employed, and two thirds were married at the time of the shooting. The only significant demographic difference between the rescue workers and civilians was that the rescue workers were slightly younger. Most (82%, $n=18$) of the rescue workers were police officers, and the remaining few consisted of EMS workers (9%, $n=2$) and security guards (9%, $n=2$). Because the EMS workers and security guards were

Table 13.1 Demographic characteristics of the sample.

	<i>Rescue workers</i> ($n=22$)	<i>Civilians</i> ($n=66$)	<i>Total sample</i> ($n=88$)
Years of age: mean (SD)	37.7 (6.2)*	39.9 (13.9)*	38.6 (12.6)
Nonwhite ethnic group: % (n)	5 (1)	18 (12)	15 (13)
Years of education: mean (SD)	14.2 (1.4)	14.4 (2.3)	14.4 (2.1)
Currently employed: % (n)	100 (22)	96 (63)	97 (85)
Currently married: % (n)	68 (15)	70 (46)	69 (61)

Note: *Significant difference between groups ($p<0.02$, Welch Two Sample t -test).

Table 13.2 Disaster experience.

	<i>Rescue workers</i> (n = 22) % (n)	<i>Police</i> (n = 18) % (n)	<i>Security/ EMS</i> (n = 4) % (n)	<i>Civilians</i> (n = 66) % (n)
Disaster trauma exposure				
On scene during shooting	36 (8)***	44 (8)**	0 (0)**	89 (59)
Witness to shooting	27 (6)*	33 (6)	0 (0)	56 (37)
Witness to aftermath only	68 (15)***	61 (11)***	100 (4)**	11 (7)
Saw others hurt or killed	91 (20)*	89 (16)	100 (4)	67 (44)
Personally injured	9 (2)	6 (1)	25 (1)	27 (18)
Perceptions of incident				
Felt personally harmed by incident	18 (4)	6 (1)	75 (3)*	26 (17)
Felt overwhelmed by incident	73 (16)	83 (15)	25 (1)*	80 (53)
Perceived risk of dying	14 (3)***	17 (3)**	0 (0)	60 (38)

Note: Compared to civilians, * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$.

few in number and similar to one another but different from the police officers in their disaster experience, predisaster history and postdisaster psychopathology, the EMS workers and security guards were combined to create a separate group consisting of four participants for the subsequent analyses. To illustrate the effects of this small group on the sample, they are presented both separately and in combination with police (i.e., rescue workers).

Table 13.2 presents data on disaster trauma exposure and perceptions of the event by study subgroups. Only about one fourth of the rescue workers directly witnessed the shooting, but two thirds were at the scene during the aftermath and virtually all of them witnessed seriously injured or dead people. Very few rescue workers were injured. In contrast, most of the civilians were present during the shooting, and one fourth of them were injured. These group differences in exposure are thus consistent with findings that most of the civilians but few of the rescue workers believed they might die in the incident. In particular, compared to civilians, a higher proportion of security officers and EMS workers reported that they felt personally harmed, and a lower proportion of security officers and EMS workers reported that they felt overwhelmed by the incident.

Table 13.3 provides predisaster and postdisaster prevalence rates of psychiatric disorders by subgroup, as assessed at the baseline interviews. Because very few postdisaster disorders other than PTSD, major depression, and alcohol and drug use disorders were observed, only these selected diagnoses are presented. The disaster-related prevalence of PTSD was 17% and the postdisaster prevalence of

Table 13.3 Psychiatric disorders at baseline.

	<i>Rescue workers</i> (n = 22) % (n)	<i>Police</i> (n = 18) % (n)	<i>Security/ EMS</i> (n = 4) % (n)	<i>Civilians</i> (n = 66) % (n)
PTSD				
Lifetime predisaster prevalence	14 (3)	18 (3)	0 (0)	3 (2)
Disaster-related prevalence	14 (3)	11 (2)	25 (1)	18 (12)
Incidence	14 (3)	11 (2)	25 (1)	18 (12)
Major depression				
Lifetime predisaster prevalence	9 (2)	11 (2)	0 (0)	2 (1)
Postdisaster prevalence	9 (2)	6 (1)	25 (1)	3 (2)
Incidence	9 (2)	6 (1)	25 (1)	2 (1)
Alcohol use disorder				
Lifetime predisaster prevalence	33 (7)	18 (3)*	100 (4)*	44 (29)
Postdisaster prevalence	10 (2)	0 (0)	50 (2)	17 (11)
Incidence	0 (0)	0 (0)	0 (0)	3 (2)
Drug use disorder				
Lifetime predisaster prevalence	10 (2)	6 (1)	25 (1)	13 (8)
Postdisaster prevalence	0 (0)	0 (0)	0 (0)	0 (0)
Incidence	0 (0)	0 (0)	0 (0)	0 (0)

Note: Compared to civilians, * $p \leq .05$.

major depression was 5% in the combined sample of rescue workers and survivors. One third (33%) of the combined sample had any postdisaster disorder (27% of rescue workers and 35% of civilians). There were no significant differences between the rescue worker and survivor groups in prevalence of any or all of these disorders either before or after the disaster. Among 18 individuals who developed disaster-related PTSD as measured either at index or follow-up, 8 (56%) were in current remission from PTSD at follow-up.

The postdisaster prevalence of alcohol use disorder for the combined sample was 15%, with no significant difference between rescue workers and civilians. New (incident) alcohol use disorders were rare after the shooting episodes, and none occurred among rescue workers. The predisaster prevalence of alcohol use disorder was 41% in the combined samples. Police officers had significantly lower, and security and EMS workers had significantly higher, lifetime predisaster prevalence of alcohol use disorder compared to civilians. Although 11% of the sample met predisaster drug use disorder criteria, no postdisaster drug use disorder was found.

Table 13.4 Mental health treatment and psychological interventions.

	<i>Rescue workers</i> (n = 22) % (n)	<i>Police</i> (n = 18) % (n)	<i>Security/ EMS</i> (n = 4) % (n)	<i>Civilians</i> (n = 66) % (n)
Formal mental health treatment	18 (4)	22 (4)	0 (0)	36 (24)
Delivered by:				
Mental health professional	5 (1)*	6 (1)	0 (0)	30 (20)
Psychiatrist	0 (0)	0 (0)	0 (0)	5 (3)
Other mental health professional	5 (1)*	6 (1)	0 (0)	26 (17)
Religious pastor/chaplain	9 (2)	11 (2)	0 (0)	6 (4)
Family doctor	5 (1)	6 (1)	0 (0)	2 (1)
Psychological intervention	82 (18)***	89 (16)***	50 (2)	38 (25)
Debriefing	73 (16)***	78 (14)***	50 (2)	35 (23)
Support group	59 (13)***	67 (12)***	25 (1)	12 (8)

Note: Compared to civilians, * $p < .05$, *** $p < .001$.

The rescue workers and civilians received different types of interventions and treatment (see Table 13.4). Fewer than one in five rescue workers received formal mental health treatment, but more than one third of civilians received formal mental health treatment. Most mental health treatment received by civilians was provided by mental health professionals who were not psychiatrists. Most of the rescue workers participated in an informal psychological intervention: nearly three fourths in psychological debriefing and more than half in support groups. Few civilians received these interventions.

Disaster-related PTSD was not associated with any demographic variable, membership in any rescue worker category, perceived risk of dying in the disaster, seeing people hurt or killed, having family or friends who were hurt or killed, or predisaster lifetime psychopathology.

Discussion

This study provided new information about rescue workers responding to multiple-shooting incidents through comparison of 22 rescue workers with 66 civilians who were present during the shootings, in a combined dataset from two separate studies that used similar research methods. The rescue workers resembled the civilians demographically. However, the disaster-related trauma exposures of the rescue workers and civilians differed. Most of the

rescue workers witnessed the aftermath and carnage of the dead and the wounded, but few were endangered during the shooting. In contrast, most of the civilians were directly exposed to the violence and many of them were injured. Despite these differences in disaster trauma exposures, both groups had a similar prevalence of disaster-related PTSD and other disorders. Postdisaster major depression was infrequent. New (incident) alcohol use disorders were rare, and no rescue workers developed an alcohol use disorder after the disaster.

A chief strength of this dataset is the collection of the data using a fully structured diagnostic instrument. The study obtained detailed information on disaster-related trauma exposure. The samples were very small, however, and almost all of the rescue workers responding to the shooting incidents were police, yielding insufficient statistical power to compare police and other rescue workers. Also, firefighters were not represented in this sample of rescue workers. Information about temporally remote predisaster periods may have been subject to recall bias. Unfortunately, the naturalistic, observational design of this study did not allow for meaningful investigation into effects of the treatment and other interventions in association with psychosocial outcomes because of potential confounding of severity of psychopathology with seeking treatment and outcomes (i.e., individuals with more severe psychopathology likely received treatment, and individuals with more difficulties would be expected to have more difficulties over time).

The slight but nonsignificant overrepresentation of preexisting PTSD among rescue workers compared to civilians likely reflects the years of exposure to trauma in their professions. Compared to civilians, police officers had a significantly lower prevalence and other rescue workers had a significantly higher prevalence of predisaster alcohol use disorders. It is possible that police may be distinct from other rescue workers with a generally lower predilection for alcohol use disorder, and other rescue workers (EMS and security workers in this sample) may have a relatively higher predilection to alcohol use disorder.

The findings from this study differ from a methodologically similar study of rescue and recovery workers comprised of firefighters responding to the Oklahoma City bombing. The firefighter rescue workers in the Oklahoma City bombing study had significantly less bombing-related PTSD and significantly more lifetime alcohol use disorder (almost all preexisting) compared to bombing survivors. In contrast, the largely police-comprised rescue worker sample in the current study did not have significantly less PTSD or significantly more alcohol use disorder compared to the civilians of the shooting.

Because similar methods were used in these studies, other factors must have contributed to these differences, such as differences between police and firefighter rescue workers, differences between bombing or multiple-shooting incidents, or other variables associated with the specific disasters. If the differences lie with the rescue worker population, it might reflect greater

posttraumatic resilience and proclivity toward alcohol use disorders among firefighter rescue workers and lack of posttraumatic resilience without alcohol proclivity among police officer rescue workers, compared to civilians of the same incidents. Although 100% of the EMS and security workers had lifetime alcohol use disorder, the small number ($n=4$) in this group reduces confidence in this finding. In contrast with the findings of Perrin et al. (2007), which found that police have a lower rate of PTSD when compared to that of firefighters or EMS workers, the current study demonstrates that police have PTSD liability comparable to that of both EMS workers and to previously reported liability in firefighters after the Oklahoma City bombing (North, Tivis, McMillen, Pfefferbaum, Spitznagel, et al., 2002). Other studies comparing and contrasting different rescue worker groups have been so few, have used very different methodological designs, and have yielded inconsistent results. The main conclusion can only be that studies must be conducted with rigorous and consistent methods so that definitive findings can be obtained and meaningful comparisons made.

In multiple-shooting incidents, not only are the individuals who are targeted at risk for PTSD, but also the rescue workers. This especially applies to police who may become engaged in a shootout with the perpetrator(s) and thus also have the experience of being a target, which might confer greater risk for PTSD compared to other responders. In this study, very few rescue workers reported having been involved in the active shooting. In other mass shooting incidents in which responders are endangered by gunfire, however, the incidence of PTSD related to the event might be higher. Although the study of the Oklahoma City firefighters suggested that they were less vulnerable to PTSD than survivors of the direct bomb blast, response to a shooting incident in which they are targeted might place disaster responders at equal or greater risk compared to civilians. The current study could not examine this possibility because of the low numbers of responders who were engaged in the gunfire.

In the current analyses, rescue workers and civilians differed in how their mental health needs were addressed after the shooting incidents. The rescue workers received relatively little formal mental health treatment compared to the civilians. Only 4 of the 22 rescue workers in this study received any formal treatment for mental health problems (only one by a mental health professional), even though more than one fourth received a diagnosis of a postdisaster psychiatric disorder. The treatment disparity between the rescue workers and civilians was not consistent with the similar postdisaster prevalence rates of PTSD, major depression, and alcohol use disorder found in these two groups. However, far more of the rescue workers compared to civilians had participated in informal psychological interventions, especially psychological debriefings.

Other disaster studies have confirmed the low proportions of rescue workers who received psychiatric treatment in the current study. In a sample of utility workers who were deployed to the site of the 9/11 attacks on the World Trade

Center in New York City, of 174 workers who accepted a referral for mental health treatment based on a diagnosis of PTSD, major depressive disorder, panic disorder, generalized anxiety disorder, or significant difficulty in role functioning during a psychological evaluation, 58% did not attend a single treatment session (Jayasinghe et al., 2005). Among rescue workers who responded to a plane crash, 15% obtained psychiatric treatment in the 13 months after the disaster, and another 17% reported needing such care but not getting it (Fullerton, Ursano, & Wang, 2004).

In a study of firefighters who served as rescue and recovery workers in the Oklahoma City bombing and received structured diagnostic assessments, 38% of a sample of male firefighters had a postdisaster psychiatric disorder, but only 16% received psychiatric treatment, representing well under half of the proportion with a postdisaster disorder (North, Tivis, McMillen, Pfefferbaum, Spitznagel, et al., 2002). In contrast, a study of directly exposed male and female survivors of the Oklahoma City bomb blast studied by the same group with similar research methods found that 45% had a postdisaster psychiatric disorder, and 41% received formal mental health treatment. Previously, it has been observed that disaster workers may be less likely than others to receive treatment (Jayasinghe et al., 2005).

Data from the combined samples in the current analyses suggest that treatment utilization overall was not as abundant as the need (with a one-third prevalence of psychiatric disorders yet fewer than one fourth receiving mental health treatment). A focused examination of the rescue workers revealed that very few received psychiatric treatment.

Several studies have reported data on debriefings received by rescue workers. A study of 181 firefighters responding to the Oklahoma City bombing found that 92% participated in “mandatory” workplace debriefings (North, Tivis, McMillen, Pfefferbaum, Cox, et al., 2002). Of 105 police officers who responded to a plane crash, 44% participated in debriefing (Carlier, Lamberts, Van Uchelen, & Gersons, 1998). Of a sample of 243 police officers exposed to various traumas, 35% had received debriefing (Carlier, Voerman, & Gersons, 2000). In a sample of 202 police officers exposed to a suicide on the job, 20% utilized counseling or debriefing by a peer or clergy (Lukaschek, Baumert, & Ladwig, 2011). Taken together, the findings of all of these studies suggest that more rescue workers generally receive debriefing than professional mental health treatment.

Because there is little to no systematic literature on the psychiatric treatment of rescue workers, knowledge about treatment of this population must draw from the treatment literature for general populations, with unknown applicability to rescue workers. A vast literature documents the strength of the evidence accumulated from research on psychotherapy and pharmacotherapy in the treatment of PTSD (Berg et al., 2007), major depressive disorder, (Gelenberg et al., 2010), and alcohol use disorder (Kleber et al., 2007).

Rescue workers, who have been characterized in general as not wanting to talk about their emotions (McGhee, 2014) may prefer medication to psychotherapy; alternatively, those with objections to psychopharmacology can instead choose psychotherapeutic options.

Psychological debriefing has become widespread as a workplace intervention for first responders, EMS workers, and military service members (Nash & Watson, 2012), while it is rarely used in more general populations. Psychological debriefing was not designed to treat or prevent PTSD or other trauma-related psychopathology (Regel, 2007), and has not been demonstrated to be effective as such (Forneris et al., 2013; Kearns, Ressler, Zatzick, & Rothbaum, 2012). Part of the reason for the popularity of psychological debriefings among emergency responders is that this intervention skirts the known problems of stigma against psychiatric treatment that are well known in this population (Dudek, 1999; Loo, 1986; Miller, 2008; Sloan et al., 1994). Participants in debriefings report finding it subjectively helpful (Bisson, Jenkins, Alexander, & Bannister, 1997; Lee, Slade, & Lygo, 1996; Magyar & Theophilos, 2010; Regel, 2007). However, it has been shown to lead to short-term increases in posttraumatic stress symptom severity (Carlier et al., 2000; Kearns et al., 2012). Its use as a sole intervention may deprive individuals with PTSD or other postdisaster psychopathology from needed mental health services that might benefit them. The findings from the current study validate this concern: Almost all of the rescue workers, who had similar prevalence of postdisaster psychopathology compared to civilians, received debriefing, but very few received psychiatric care; in contrast, few civilians received debriefing, but many more received formal mental health treatment.

Additional caveats have been presented in recent years to the use of psychological debriefing. One is that participation in debriefings should not be made mandatory (Rose, Bisson, Churchill, & Wessely, 2002). Individuals with PTSD by definition have considerable avoidance and numbing reactions, which are conceptualized as arising from an inability to cope with prominent intrusion and hyperarousal symptoms (Foa, Riggs, & Gershuny, 1994; Thompson & Waltz, 2010). It follows that individuals with prominent avoidance and numbing responses might have difficulties participating in an intervention focused on an overwhelming trauma that they have recently experienced and may find this intervention in itself to be further traumatizing (Rose et al., 2002). Consistent with this possibility, research has demonstrated that PTSD symptoms may increase in the short term after participation in debriefing (Carlier et al., 2000; Kearns et al., 2012). Other concerns expressed about psychological debriefing are that single sessions may be insufficient or even detrimental, and that follow-up is important for identifying individuals needing additional treatment (Nash & Watson, 2012; Regel, 2007). It is thus advisable to identify individuals with high levels of distress or psychopathology already apparent in the early postdisaster phases and refer them to further assessment and/or treatment rather than including them in debriefing activities (Forneris et al., 2013; Nash & Watson, 2012).

In practice, however, debriefings have routinely been administered regardless of participants' readiness to confront intrusive memories, and without follow-up (Nash & Watson, 2012). The sanctioned substitution of psychological debriefing for formal treatment in the workplace may serve to send a message that only this intervention is needed, further discouraging rescue workers from receiving psychiatric services.

The data presented in this analysis of rescue workers responding to multiple-shooting incidents demonstrated evidence of mental health needs, little utilization of formal psychiatric care, and a reliance on informal psychological interventions. These findings indicate a need to refocus resources to provide treatment for individuals with psychiatric disorders, for whom brief psychological interventions are insufficient and possibly even harmful. A recent systematic review (North & Pfefferbaum, 2013) provided a framework to guide disaster mental health response and direct individuals, including rescue workers, to appropriate interventions. This disaster mental health framework is composed of three main functions: identification of cases, stabilization and triage to appropriate care, and provision of mental health services.

Conceptually, this disaster mental health framework indicates that psychiatric diagnosis is a necessary first step for identification of need for care (preceded by screening if the burden of numbers is prohibitory of full diagnostic assessment of all individuals). Addressing postdisaster distress through psychological interventions can be helpful for most people affected by disasters, especially in the early postdisaster time frame. Individuals diagnosed with trauma-related psychiatric disorders, however, need referral to appropriate treatment. The findings in the current study suggest that following this framework would have resulted in the referral of a higher proportion of rescue workers with psychiatric disorders to treatment services than to psychological debriefings not meant for treating psychiatric illness.

The findings that rescue workers in this study had higher lifetime prevalence and a similar postdisaster prevalence of alcohol use disorder compared to civilians in these time frames suggest the need for assessment for alcohol use disorders and their treatment in this population. This recommendation is not just in the context of disaster because of the finding that alcohol use disorders are specific to this population rather than to disaster; clearly, there is no need to wait for a disaster to intervene. The relatively low prevalence of alcohol use disorder in police compared to other rescue workers in this study and other studies suggests that firefighters, security guards, and EMS workers may especially benefit from this intervention, but further study is needed to verify these results.

There are several known barriers to utilization of disaster mental health services by rescue workers. One is perceived stigma associated with carrying a psychiatric diagnosis and receiving treatment. There is a culture of "machismo" (Egan, 2001), promoting attitudes that rescue workers in general may feel a need to represent themselves as pillars of strength. In this context, mental illness may be viewed as

evidence of weakness and inability to cope, implying lack of fitness for duty. A logical extension of these views is that to avoid being branded as being weak of character or incompetent for the rescue worker line of work, mental health professionals must be avoided. There exists a lore that police officers wish to avoid being branded as having psychological problems not only because their peers and superiors will see them as weak, but also because they fear that being labeled with a psychiatric diagnosis could limit promotion opportunities, get them fired, or end their career (McGhee, 2014; Royle, Keenan, & Farrell, 2008).

Potential threats to confidentiality may occur with provision of mental health services at the workplace where others can observe the employee receiving care, and with processing of insurance or billing claims for psychiatric care through the place of employment. Concern about loss of confidentiality understandably provides a strong disincentive for rescue workers to seek mental health treatment and to be open in self-disclosure in treatment (Taube & Elwork, 1990). Studies are needed to accurately document the magnitude of the perception of this risk among rescue workers and the factors that lead to these perceptions. General recommendations to all employers for protection of confidentiality of rescue workers can be made, and subsequent assessment can be carried out to determine if employers have indeed provided adequate protections and to reassess the degree of nonparticipation in mental health services among those in need.

Perception that mental illness is incurable can result in continuing stigma associated with mental illness even after it is successfully treated (Bolton, 2003; Thornicroft, 2006). Ironically, treatment can help rescue workers come to the realization that seeking treatment requires the very strength of character that is valued in their profession. A cultural shift to view mental illness as a normal and treatable response to stress will help to reduce the stigma that currently impedes treatment (Royle et al., 2008).

Yet another barrier to psychiatric care for rescue workers is lack of access to adequate services. The availability of specialists in evidence-based trauma-focused therapy is limited, especially in rural areas. Telemedicine could provide one potential means of overcoming this shortage of specialists, as suggested by a pilot study of prolonged exposure therapy for combat veterans. In this study, PTSD improved significantly with both in-person therapy and telehealth treatment, and the two methods of treatment delivery were equivalent in symptom outcomes (Tuerk, Yoder, Ruggiero, Gros, & Acierno, 2010).

Conclusions

Data on rescue workers responding to multiple-shooting incidents are virtually nonexistent; the current small study of 22 rescue workers is the only such study providing full diagnostic assessment data that exists. The datasets that were used for the analyses in the current study were small and lacking in representation of

broad disciplines of rescue workers. The collective research conducted to date on rescue worker mental health has lacked sufficient numbers and systematic methods needed to combine and compare samples to provide firm conclusions and definitively inform policy and practice. This lack of knowledge is even more acute for the specific subpopulation of disaster rescue workers. Only so much can be extrapolated from research on rescue workers in other settings to apply to rescue workers responding to mass shootings. Further studies with methodological rigor are needed, using instruments that assess full diagnostic criteria for psychiatric disorders. In addition to PTSD, major depressive disorder and alcohol use disorder are prevalent and warrant assessment in research studies. Both predisaster and postdisaster morbidity data should be obtained as well as detailed exposure data that can be classified according to currently existing criteria for PTSD.

Once sufficient data on the mental health sequelae of mass shootings on rescue workers become available from epidemiological, naturalistic, and observational studies, future research will need to develop and test interventions and treatments specific to this population. Although much work remains to be done, the rescue workers who come to the aid of mass shooting survivors deserve the best treatment we have to offer.

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Distress Among Journalists Working the Incidents

Klas Backholm

Suddenly occurring large-scale crises, such as mass shootings, are at the heart of the news (Brayne, 2007). Journalists immediately start covering the unfolding events, and are expected to rapidly create products for several media platforms. A journalist's job description in a crisis differs from other crisis occupational groups on several levels. For example, journalists are the only group present at a crisis scene with a main work description that does not focus on handling the actual crisis, but rather to inform the public about what has happened (Englund, 2008; Newman, Shapiro, & Nelson, 2009). In addition, while first responders and other rescue personnel often deal with emergencies on a regular basis, most journalists are only sporadically exposed to crisis-related assignments (Smith, Newman, & Drevo, 2015). Journalistic work related to crises is not limited to only those journalists who are present at the crisis scene. The work description may also include combinations of tasks and settings, such as carrying out tasks from one's office or doing interviews elsewhere with individuals indirectly affected by the event (Weidmann & Papsdorf, 2010). To understand how journalists may be affected psychologically by large-scale incidents, such as a mass shooting, one must have insight into the occupation-specific conditions and expectations related to news reporting following crisis events.

The Assignment

To date, a limited number of research publications have focused on the impact of mass shootings on journalists' psychological health. Therefore, to be able to provide an adequate description of mental health-related issues among journalists who work potentially traumatic events, I have chosen to also include information based on other forms of large-scale crises in this chapter. I will also illustrate the included content by presenting examples from our research on the

mass shootings that occurred in Jokela and Kauhajoki in Finland in 2007–2008, as well as the terrorist attack that involved a shooting at Utöya Island and bombing in central Oslo, Norway in 2011.

Several studies that used a qualitative approach have provided descriptions of the journalistic tasks that are carried out, and the emotions provoked, during an ongoing mass shooting or other type of large-scale crisis (Backholm, Moritz, & Björkqvist, 2012; Berrington & Jemphrey, 2003; Englund, 2008; Idås, 2013; Raittila, Koljonen, & Väliaverronen, 2010). When the first pieces of information about an unfolding event reach a news office, a well-oiled machine is set in motion. In the first minutes, several processes are initiated. In parallel with the news desks investigating the details of what is happening, coordinating editors identify available journalists and assign tasks to those who are at the office at that moment. Individual journalists assess the relevance and the status of the tasks they were carrying out before they heard about the crisis, and decide whether they can postpone the tasks and focus on the new assignment or not. The journalists' physiological arousal is quickly heightened, and the individual, as well as the collective news office, adjusts to what has suddenly changed from an ordinary to a hectic day at the office. Although sudden, this adjustment is not unexpected, as most journalists see crisis-related work as a potential part of their work description (Brayne, 2007; Simpson & Coté, 2006).

Journalists differ in how they compare their crisis-related work to everyday routines. According to some, crisis-related assignments are just a more extreme version of their typical work activities. The same tasks are carried out in both cases, but crises involve some unique contextual factors, such as more demanding time constraints and increased difficulty in reaching interviewees. These factors require increased professional focus. Others see crisis-related assignments as very different from their everyday work. During crises, a journalist may need to consider specific aspects of journalism practice that are irrelevant in their everyday work. For example, one may need to approach victims and make a decision about whether this person is a reliable witness or not. Also, journalists may need to take into account their own level of risk because they could potentially witness grotesque details while carrying out work tasks (Brayne, 2007; Englund, 2008; Hughes, 2012; Raittila et al., 2010; Simpson & Coté, 2006). In other words, a journalist will need to rely on their previous experience from everyday work to be able to carry out their work in a demanding situation – but will also need to apply specific journalistic principles which are unique to an assignment of this type.

As mentioned above, the sudden change from an ordinary to a hectic day at the office may cause a heightened level of physical and psychological stress among the workers. Journalists have often referred to the heightened level of arousal in a crisis as going into “hyper mode” or switching into “autopilot” (Backholm et al., 2012; Englund, 2008; Idås, 2013). This “autopilot” may

lead journalists to focus entirely on the assignment, feel a high level of physical alertness, experience a sense of detachment from reality, forget basic needs such as eating, and suppress personal emotions to be able to continue to work while faced with distressing details about a crisis.

The term “autopilot” may not be ideal, as it can be interpreted as a person who is not in control of themselves. Conversely, it reflects the journalist’s professional ability and readiness to suddenly change into a more extreme work mode. Idås (2013) described the combined functions of focusing entirely on the task and distancing oneself from the emotional distress provoked by any gruesome details of the crisis as a professional shield that allows the journalist to get the job done.

Journalists have described how, in most cases, the professional shield or “autopilot” is in place and continues to protect them from emotional distress until the assignment is over (Englund, 2008; Idås, 2013). When the high level of assignment-related stress is reduced, often co-occurring with the journalist physically leaving the crisis scene or office setting, personal emotions may emerge. In a study conducted with journalists who worked at the scene or indirectly with the Jokela school shooting in Finland ($n=196$; Backholm & Björkqvist, 2012), 126 participants chose to describe their general “thoughts or feelings” after working the incident. A majority focused on describing work-related tasks or the overall nature of the assignment by mentioning that they were on “autopilot” or operated like a robot.

Distress in the immediate aftermath of the assignment may take on varying forms, including combinations of general sadness or anxiety, empathy for the victims, occupation-related guilt, crying, fear, shock, dissociation, anger, or overwhelming fatigue. In contrast, some journalists report only mild or complete lack of distress in the aftermath of a crisis (Backholm & Idås, 2015; Brayne, 2007; Englund 2008; Simpson & Coté, 2006; Newman et al., 2009). In the aforementioned study of journalists from the Jokela school shooting in Finland (Backholm & Björkqvist, 2012), 43% of the participants reported negative emotions, such as feelings of fear, sadness or anxiety, in the direct aftermath of the event. A couple of journalists mentioned that the assignment did not provoke any reactions, and a select few described positive reactions, such as reporting that the case was rewarding from a journalistic viewpoint. In another study based on semistructured interviews with 28 journalists who worked the scene during either the Jokela incident or the Kauhajoki shooting in Finland in 2008, roughly 50% of the participants reported short-term distress (Backholm et al., 2012).

Although most of the reactions described above are experienced as negative and discomforting at the time, they should not necessarily be interpreted as early signs of a long-lasting psychological diagnosis caused by direct or indirect exposure to the crisis. On the contrary, for most people, their reactions in the aftermath of a crisis should be seen as part of a normal healing process of trying

to understand the meaning and impact of the sudden and unexpected event. In addition, individual differences affect how potentially traumatic experiences are processed. Journalists who do not experience distress in the immediate aftermath of an assignment should therefore not be automatically labeled as avoiding or suppressing their feelings, as the person may have interpreted the assignment as a low-risk situation (Backholm & Björkqvist, 2012; Bryant, 2004; Idås, 2013; Norris & Slone, 2014). Later in this chapter, I will return in more detail to the occupational risk factors for long-term psychological impairment that may occur during and in the direct aftermath of a crisis.

Although short-term distress in journalists mainly seems to occur after an assignment is over, there are some descriptions in the literature of how the professional shield, or “autopilot,” can be disrupted during an ongoing assignment. When this happens, journalists’ stress levels may increase to such a degree that they can no longer distance themselves from the emotional impact of the crisis. As a consequence, overwhelming exhaustion, lack of energy, or related difficulties may appear (Backholm, 2012; Idås, 2013). In turn, their ongoing work tasks may suffer, at least momentarily. This type of disruption of the professional shield has seldom been described in detail or been empirically investigated. Thus, there is a lack of detailed information about its exact causes and relevant contexts.

However, one factor that has been described as a disruption by some journalists who worked either the Jokela or Kauhajoki school shootings in Finland (Backholm, 2012; Idås, 2013) or the tsunami in Asia in 2004 (Idås, 2010) was ethical dilemmas. Such dilemmas can be defined as an inner conflict between the journalistic requirements of the assignment and feelings of empathy for those directly affected by the crisis. These journalists reported that they experienced dilemmas when they went beyond their own personal norms for ethically acceptable behavior in the line of work, usually due to requirements set by the editorial office or other factors beyond their control.

For example, a journalist who worked the Kauhajoki shooting described how he was ordered by his superiors to visit the home of a friend of the perpetrator and ask this person for an interview. An elderly woman answered the door and declined to participate. A few hours after the visit to the home, the journalist’s editorial office informed him that the friend was actually one of those killed in the shooting. As the reporter strongly believed that “death knocks” (i.e. visiting the homes of victims’ families to ask for interviews) was a form of unethical journalism, this turn of events caused a severe disruption in the journalist’s professional shield and resulted in a strong emotional reaction during the ongoing assignment (Backholm et al., 2012). As will be described in greater detail below, such ethical dilemmas may not only cause acute distress, but can also increase the risk for long-term psychological difficulties.

Long-Term Psychological Impairment in Journalists

The first scientific publication on long-term psychological distress among journalists was published as late as 1994 (Freinkel, Koopman, & Spiegel, 1994; Simpson & Coté, 2006). Feinstein (2006), who published the first study on war correspondents' occupational health, argued that the reason trauma-related mental health among journalists was not examined until then was a reflection of the expectation of journalistic objectivity. Journalists were expected to objectively report on crises and to not include subjective opinions. As a result, a journalist should not be psychologically affected by the event.

During the past two decades, studies on trauma and journalism have continuously added to the collective knowledge base. Although we now have a relatively solid foundation of empirical information about several central issues related to the psychological impact of trauma on journalists, the generalizability of these studies is questionable and our knowledge is limited because of the types of crises examined, sample inclusion criteria, time periods used for data collection, and sample sizes (Aoki, Malcolm, Yamaguchi, Thornicroft, & Henderson, 2013; Backholm, 2012; Smith et al., 2015). Subsequently, the conclusions presented below, although informative, should be interpreted with caution.

Posttraumatic stress disorder (PTSD) has been the psychological disorder of focus in most studies examining the impact of crisis-related work among journalists (Smith et al., 2015). In the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5), a diagnosis of PTSD requires that an individual was exposed to a traumatic stressor either directly (e.g., physically witnessing an event) or indirectly (e.g., hearing that the event happened to a close relative). Related to the topic of this chapter, exposure to extreme details, including through media, does satisfy this criterion, when it is work-related. Furthermore, the individual must report symptoms that span four categories. These symptom domains include intrusion symptoms (i.e., when the trauma is reexperienced in a sudden and involuntary manner), avoidance of reminders of the trauma, changes in cognition and mood, and alterations in physiological arousal or reactivity (e.g., hyper-vigilance, aggression, self-destructiveness; American Psychiatric Association, 2013; Miller, Wolf, & Keane, 2014). The symptoms must persist for at least one month and be severe enough to lead to significant impairment and distress. Estimates of lifetime PTSD in nonjournalist general population studies in Europe and North America usually range from 1 to 9% (American Psychiatric Association, 2013; Blanco, 2011; Kilpatrick et al., 2013).

In the aftermath of mass shootings or other crisis-related assignments, a small subgroup of journalists develops PTSD. However, the majority of journalists report few long-term psychological difficulties. In a review of 11 studies, the prevalence of PTSD among journalists who had worked crises was

between 0.0 and 33.0% (Aoki et al., 2013). Smith et al. (2015) found evidence of similar figures, which ranged from 4.3 to 35.0%, in their review of 15 studies. However, when studies were excluded if they included subjects with chronic exposure to severe stressors (e.g., war correspondents) the documented prevalence rates were lower.

Some studies on journalistic work during and after mass shootings have included PTSD prevalence figures. In a sample of journalists who worked the Norwegian terrorist attack in 2011 ($n = 375$), during which almost half of the group ($n = 144$) was on the scene either in Oslo or at Utöya, 9% had probable PTSD (Idås & Backholm, 2016). Similarly, 12% of journalists who worked the Jokela school shooting in Finland in 2007 ($n = 196$) reported symptoms severe enough to be suggestive of PTSD (Backholm & Björkqvist, 2012). A majority of the journalists in this sample (86%) were only indirectly exposed to the unfolding crisis and had not worked at the crisis scene.

When it comes to the prevalence of PTSD, it is important to remember that the figures presented above represent the small group of journalists who had severe reactions to the crisis and met full criteria for the disorder. There are some journalists who would best be described as experiencing partial or subsyndromal PTSD (i.e., experiencing some symptoms but not meeting the full diagnostic criteria; Friedman, Resick, Bryant, & Brewin, 2011). These journalists are important to consider because they may need postassignment organizational support or mental health care services. However, as the prevalence of partial PTSD has seldom been reported in journalist samples, we know very little about this subgroup.

PTSD is not the only type of psychological impairment that may occur following work-related exposure to a traumatic event. In nonjournalist trauma samples, at least one comorbid diagnosis is the rule rather than the exception (see Blanco, 2011 for review of epidemiological studies). According to the DSM-5, 80% of people with PTSD have a second mental disorder (American Psychiatric Association, 2013). The main comorbid disorders include depression, somatization, anxiety, and substance abuse (Reardon, Brief, Miller, & Keane, 2014).

Other forms of psychological difficulties have also been studied in journalist samples, either as disorders that co-occur with PTSD or as the main outcome disorder following potentially traumatic assignments. Such types of impairment include depression (Feinstein, Owen, & Blair, 2002; McMahon, 2001; Teegen & Grotwinkel, 2001; Weidmann, Fehm, & Fydrich, 2008), general psychological distress (Feinstein, 2013; Feinstein, Audet, & Waknine, 2013; Weidmann & Papsdorf, 2010), substance abuse (Feinstein, 2013; Feinstein & Starr, 2015), and burnout (Backholm & Björkqvist, 2010; Dworznik, 2008; Thoresen, 2007). However, to date, there is not enough evidence to be able to identify any conclusive prevalence rates for specific comorbid disorders

following trauma in journalist samples (Aoki et al., 2013), or to identify patterns of comorbidity relevant for journalists working mass shootings.

Risk Factors for Psychological Impairment in Journalists

Despite an overall lack of empirical evidence, the available research has revealed several factors that increase the risk for long-term psychological impairment in journalist samples. Again, the following overview of risk factors should be interpreted with caution as the current knowledge about this occupational group is limited due to the relatively small number of studies, inclusion of varying types of samples, and a wide range of definitions of distress across the studies. Some of the most extensive meta-analyses of risk factors for PTSD in nonjournalist samples have been provided by Brewin, Andrews, and Valentine (2000) and Ozer, Best, Lipsey, and Weiss (2003). Many of the same factors that predict PTSD in general population samples have been found among journalists. Such factors include previous exposure to traumatic situations and use of avoidant coping strategies when faced with life stressors. In addition, a number of factors have been demonstrated that reflect the unique tasks and contexts relevant for journalistic work. Occupation-specific risk factors include the journalist's previous experience with crisis-related assignments, as well as the conflict of being a working journalist and an empathic fellow citizen. Below, central risk factors for psychological distress are divided into subgroups based on whether the factors are present before the crisis assignment (i.e., preassignment risk factors), occur during the crisis (i.e., peri-assignment factors), or happen after the assignment (i.e., postassignment factors).

Preassignment risk factors

Some of the personality and cognitive risk factors observed in nonjournalist samples (e.g., neuroticism, aggressive temperament, avoidant coping strategies) have also been related to long-term psychological functioning in journalists (Marais & Stuart, 2005; Smith, 2008). For example, in a sample of South African news journalists ($n=50$), Marais and Stuart (2005) found that those who had a more hostile or aggressive temperament reported more severe PTSD symptoms. Smith (2008) studied whether coping style was related to psychological distress in a sample of American news journalists ($n=167$) and found that participants who avoided dealing with problems reported higher levels of PTSD symptoms and general psychological distress.

The number of years working as a journalist seems to affect the severity of PTSD symptoms in several ways. Being an inexperienced journalist (Backholm & Idås, 2015; Teegen & Grotwinkel, 2001) or a very experienced journalist

(Newman, Simpson, & Handschuh, 2003; Simpson & Boggs, 1999) have both been found to enhance the individual's risk for more severe impairment. It has been suggested that inexperienced journalists have underdeveloped work skills and thus may be more vulnerable when carrying out crisis-related assignments. Conversely, very experienced colleagues may suffer from accumulative experiences of potentially traumatic events during their careers.

The everyday pressure and requirements in the newsroom may in themselves also affect personal wellbeing, regardless of years of experience as a journalist. Studies have shown that a higher level of everyday stress at one's workplace is related to more psychological distress after working a crisis assignment (Hatanaka et al., 2010; Smith, 2008; Weidmann & Papsdorf, 2010). In a sample of news journalists from Germany, Austria, and Switzerland ($n=81$), Weidmann and Papsdorf (2010) combined measures of environmental stressors in the workplace, interpersonal problems at work, time pressure, workload, job demands, and freedom at the workplace into a work stress score, and found that more everyday work stress was related to more severe distress within two of the PTSD symptom categories (i.e., intrusion and avoidance symptoms).

Greater previous exposure to traumatic events in one's personal life has been linked to greater levels of journalists' PTSD symptoms, as well as other forms of distress (e.g., depression and burnout; Backholm & Björkqvist, 2010; McMahon, 2005; Newman et al., 2003; Pyevich, Newman, & Daleiden, 2003; Weidmann et al., 2008; Weidmann & Papsdorf, 2010). Working a crisis that is closely reminiscent of the journalist's personal life may increase the risk for postassignment impairment. For example, being a journalist from the affected region or being a parent to children roughly the same age as the crisis victims may be associated with more distress after the assignment. Berrington and Jemphrey (2003) found that among journalists who worked the Dunblane mass shooting in Scotland in 1996, those who had young family members reported more emotional distress after the assignment. The same was true for journalists who worked the scene of the two Finnish school shootings in 2007–2008. The shootings were the first incidents of this type to occur in the country, and journalists who had children reported that they experienced distressing intrusive thoughts about their children's future in relation to the "new unsafe school environment" (Backholm & Björkqvist, 2012; Backholm et al., 2012).

In some studies, greater exposure to previous crisis-related assignments has been linked to greater distress (Browne, Evangeli, & Greenberg, 2012; Marais & Stuart, 2005; Newman et al., 2003; Pyevich et al., 2003; Simpson & Boggs, 1999), while other studies have not found a relation (Backholm & Björkqvist, 2010; Dworznik, 2008; Smith, 2008). These mixed findings may be explained by the fact that journalistic work during crises may take on varying forms, as stated above. For example, some journalists may be directly exposed to the unfolding event, while others carry out their work from a distance. Thus,

focusing on the number or range of previous assignments without detailed information about the nature of the exposure may not be the most fruitful approach.

Peri-assignment risk factors

Studies focusing on work in extreme crisis scenarios, such as war or ongoing conflict zones, have shown that more severe exposure during the assignment is linked to more severe psychopathology symptoms (e.g., PTSD, depression, substance abuse; Feinstein et al., 2002; Feinstein, 2013; Feinstein & Starr, 2015). Also, studies in nonconflict settings that have included measurements of the nature and intensity of the assignment (e.g., the number of gruesome details a journalist is exposed to, whether the journalist was directly threatened, attacked, or injured during the assignment; Pyevich, 2001) have shown that more severe events are associated with increased risk of PTSD, depression, and burnout (Backholm & Björkqvist, 2010; Dworznik, 2008; Idås, 2011; Smith, 2008; Thoresen, 2007). Because journalists who work mass shootings may be exposed to a wide range of gruesome details, (e.g., reporting details of a large number of victims, learning that some of the victims were young, directly witnessing deceased or injured), the nature of this crisis subtype may be especially harmful for journalists, particularly for those at the scene of the event.

The “gruesomeness” of an assignment has often been measured in terms of the journalist’s level of exposure to details while at the scene of the unfolding crisis. As previously mentioned, the first requirement for a diagnosis of PTSD in the DSM-5 (American Psychiatric Association, 2013) is the stressor criterion. This requirement states that an individual must experience a traumatic event through direct exposure, witnessing the event, indirect exposure by learning the event happened to someone close to them, or repeated/extreme exposure to aversive details of the event via electronic media, television or pictures, as long as this exposure is work-related. Therefore, for a journalist, exposure to a traumatic event may include viewing recorded material, such as pictures or videos from the crisis. A few studies with journalists have examined varying subtypes of indirect exposure. More frequent exposure to video footage of violent events produced by other journalists or the public (e.g., video clips recorded with smart phones at the crisis scenes) have both been linked to greater levels of PTSD symptoms and other forms of psychological impairment (Feinstein et al., 2013; Weidmann & Papsdorf, 2010).

Related to this, current journalistic work with mass shootings often includes using several social media platforms in addition to more traditional types of information sources to monitor the crisis, to gauge the public’s view of the crisis, and to identify eye witnesses or other potential participants for one’s media products (Silverman, 2014). The challenges related to journalists’ social media usage during crises have been identified in the ongoing European

Researching Social Media and Collaborative Software Use in Emergency Situations (RESCUE) project. The journalists and communication experts who are participating in this project have pinpointed several sources of stress, which include problems related to identifying relevant content among the vast amounts of information posted on social media platforms during a crisis and being able to verify the trustworthiness of the identified information (Hornmoen et al., 2015). These results have been replicated in other studies (Bae Brandtzaeg, Luders, Spangenberg, Rath-Wiggins, & Folstad, 2016), but it is premature to conclude whether this stress may be a risk factor for long-term psychological impairment among journalists. However, the initial evidence indicates that the amount of time journalists spend monitoring user-generated content may affect their wellbeing (Feinstein et al., 2013). This suggests that monitoring events that have a high impact on social media, such as mass shootings, is also a risk factor for long-term psychological impairment. The possible effect of the information and interaction between journalists and the public in social media platforms during mass shootings and similar crises needs to be taken into consideration in future studies on journalists and trauma.

As stated in the section above about the journalist's professional shield, this protective function may be disrupted during an assignment, which may lead to greater stress and difficulties while carrying out work tasks. Studies on long-term impairment have shown that greater peri-assignment distress is associated with increased risk for subsequent long-lasting impairment among journalists (Backholm, 2012; Englund, 2008; Hatanaka et al., 2010; Idås, 2013). In a sample of Japanese journalists ($n=270$), Hatanaka and colleagues (2010) found that peri-assignment symptoms (e.g., dissociation, sleeplessness, digestive problems) predicted more severe PTSD symptoms.

Hatanaka et al. (2010) also investigated whether occupation-specific problems during an assignment (i.e., factors that may disrupt the professional shield) were related to greater levels of PTSD among journalists who worked at the scene of the crisis ($n=179$). In this study, the problems they examined included how difficult it was to complete the assignment and the number of complaints received about the coverage. The results revealed that as the number of problems increased, the journalists reported more long-term impairment. A study conducted with news journalists who worked the terrorist attack in Norway in 2011 ($n=371$; Backholm & Idås, 2015) included journalists who had either worked the bomb explosion in the capital of Norway or a mass shooting at a youth camp on the island of Utöya. This study examined occupation-specific problems during the assignment in a slightly different way by focusing on ethical dilemmas, which were unexpected events that forced a journalist to break their norms for ethically acceptable journalistic behavior (Backholm, 2012; Idås, 2010). The results revealed that those with greater exposure to ethical dilemmas also reported more severe PTSD symptoms 8–9 months after the incident.

Postassignment risk factors

Risk factors for long-term psychological impairment should not be limited to only those occurring before or during a possibly traumatic event. Posttrauma factors, such as contextual circumstances or the development of certain event-related traits in those affected, may also increase risk for PTSD (Vogt, King, & King, 2014). Contextual circumstances are factors related to the external situation. For example, the explanation of the cause of the crisis is left unidentified or affected individuals receive low levels of peer support. Event-related traits are internal factors in an affected person, and may include negative thoughts (e.g., shame, guilt) or unhealthy behaviors related to how one handled the incident. Few studies with journalism samples have included measures of such factors, but there is some evidence that posttrauma factors are important to consider in journalist samples.

One factor that may affect journalists' wellbeing after working crises is the public debate and criticism related to journalistic work and ethics. The public view of the crisis is, to a large degree, dictated by how the event is portrayed in mass media (see Chapter 7 for more on the impact of media on the public's attitudes). Unaffected citizens gather their information about an event via mass and social media, as well as personal communication with their peers. In turn, these individuals share select parts of this information via their own social media networks. This information gathering and forwarding process is based on an underlying expectation that journalists will provide the public with a trustworthy and broad picture of the unfolding event (Brayne, 2007; Coombs, 2015; Falkheimer & Olsson, 2015; Muschert, 2007).

However, the journalistic work carried out during the event may also become the outspoken focus of the public debate, especially if the work is not in line with the underlying public expectations. For example, rumors of unethical journalism may cause a public debate about journalism ethics in the crisis aftermath, no matter if the rumor can be verified or not. This debate may also expand from the case in question to a more general criticism against journalistic work during and after a crisis. One such example was the debate following the Finnish mass shooting in Jokela in 2007. A group of young adults started a mass petition on the web to highlight what they experienced as unethical journalistic behavior at the crisis scene. As a result, a majority of Finnish media organizations updated their internal ethical codes of conduct. However, identifying the actual journalists that carried out unethical tasks during the shooting proved to be difficult (Raittila et al., 2010).

Public criticism against crisis-related journalism may also be instigated simply because of the vast amount of overall coverage of the event in national or regional media. This public reaction may take varying forms. For example, following the mass shooting at Utøya Island, Norway in 2011, two out of three Norwegians ($n=802$) and approximately half of Norwegian journalists

($n=637$) thought the media coverage was too extensive (Aarebrot & Maeland, n.d.). During the trial following the attack, some newspaper stands in Norway chose to not display front covers of newspapers that showed pictures of the perpetrator, and Facebook groups demanded boycotts against newspapers (Brurås, 2011).

The criticism of the coverage has in some studies been proposed as a risk factor for psychological distress in journalists. In the aftermath of the Jokela school shooting in Finland, some journalists (28 %) indicated that the criticism against their trade provoked by the online mass petition caused short-term negative emotions. The journalists indicated that the public expects them to cover the incident, but criticize them when they do. They reported that their reactions included anger, frustration, and a strong need to defend their own or colleagues' work (Backholm & Björkqvist, 2012). However, it is difficult to compare the impact of public criticism when examining different types of crises because the content and dynamics of the criticism depend on the nature of the event. Furthermore, it is still unclear how this factor contributes to long-term psychological impairment in journalists. Due to the nature of the event (e.g., occur in public places, result in mass casualties), mass shootings result in massive media attention. The risk of negative public reactions about journalistic practices may in these cases be particularly damaging – especially if the main target group of the shooting is children or young adults. Therefore, journalists who work mass shootings may be at greater risk of becoming targets of criticism.

In addition to identifying posttrauma risk factors, some studies with journalist samples have investigated how the postassignment development of specific individual traits may affect long-term symptoms of distress. Pyevich et al. (2003) found that American newspaper journalists ($n=906$) with greater previous exposure to potentially traumatic assignments tended to develop more negative posttrauma cognitive schemas, and in turn, more severe PTSD symptoms. The results revealed that more negative cognitive beliefs mediated the relationship between previous trauma exposure and PTSD.

Another factor that has been investigated as a possible mediator in the relationship between crisis-related assignments and PTSD in journalist samples is guilt. Browne et al. (2012) found that more severe trauma-related guilt mediated the association between a greater amount of previous work with crises and greater PTSD symptoms in 50 British news journalists. In a study on the coverage of the Norwegian terrorist attack ($n=371$; Backholm & Idås, 2015), a similar pattern was found. Journalists who had experienced more ethical dilemmas during their assignment also experienced more postassignment guilt (e.g., having been too intrusive towards those directly affected), as well as more long-term psychological distress in the form of PTSD symptoms.

Thus, although defined somewhat differently between studies, the development of posttrauma negative cognitions seems to be relevant for long-term

psychological functioning. This is consistent with previous research with trauma victims (Dalglish, 2004; Kubany & Watson, 2003; Lee, Scragg, & Turner, 2001). The development of negative cognitions is also one of the symptoms of PTSD based on the DSM-5 diagnostic criteria (American Psychiatric Association, 2013). Therefore, the possible causes of guilt and other relevant negative cognitions warrant further scholarly attention, preferably in studies with a longitudinal research design.

Resilience in Journalists

The main focus of this chapter has been on the possible negative mental health consequences of crisis work in journalists. However, as mentioned above, most journalists report few psychological difficulties after working a mass shooting or other type of potentially traumatic assignment (Newman et al., 2009). Therefore, a discussion of resilience, or the ability to overcome adversity or stress (Rutter, 2006), is warranted. As stated by Bonnano (2004), factors that promote resilience in an occupational group exposed to a potentially traumatic event should not be limited to only “the opposite” of risk factors, but rather other factors should also be included.

Few studies with journalists have included factors that promote resilience. But of the few factors that have been examined, one of the most commonly included is the level of social support the journalist receives following the assignment, either from family, friends, or colleagues. Studies with varying types of journalist samples have generally found evidence of the positive effects of having a well-functioning social network (Aoki et al., 2013; Newman et al., 2003; Thoresen, 2007; Weidmann et al., 2008), with a few exceptions (e.g., Hatanaka et al., 2010). The types of support provided by different individuals may vary. For example, family and friends know the person outside of the occupational role, and therefore can provide support that reflects the journalist’s personal needs. Colleagues likely have more insight into the occupation-specific challenges and how the assignment in question was experienced by the journalist. Therefore, they are able to provide profession-focused social support after the assignment (Brayne, 2007; Idås, 2013).

Another factor that may support resilience among journalists, which is related to workplace social support and recognition, is the level of personal satisfaction a journalist experiences with their products. For journalists, being pleased with how one managed or completed specific tasks or the final media products may reflect a more general feeling of having actively contributed to a positive outcome following a crisis (Newman et al., 2009). This could be seen as the opposite of experiencing ethical dilemmas, but should perhaps not be limited to dilemmas only. For example, Hatanaka et al. (2010) constructed a scale reflecting level of achievement during coverage, consisting of items such

as positive feedback from the public. They, however, did not find any relation between the scale and levels of impairment among the 270 participating journalists. Marais and Stuart ($n = 50$; 2005) did, on the other hand, find that those journalists who perceived that they could handle the demands related to crisis-related work had lower levels of posttrauma distress. Clearly, broadening the scope of future research beyond focusing on risk factors would be relevant for the knowledge in the area of journalism and trauma.

Conclusions

To conclude, several key findings and general comments should be highlighted regarding our current knowledge base about psychological impairment in journalists who work mass shootings. First, journalists who work mass shootings or other types of crises may react strongly to what they experience in their line of work. However, in most cases, journalists are able to carry out the tasks at hand and typically do not develop severe long-term trauma-related psychological disorders. Second, to understand distress and resilience among journalists who work crises, we need to understand the specific occupational challenges (e.g., ethical dilemmas) relevant to journalists and mass media. Third, due to the type of event (e.g., large number of victims, grotesque details), mass shootings may be associated with heightened risk for psychological distress in journalists – but we need additional future research before we can draw any final conclusions. Fourth, to promote wellbeing and resilience among journalists, workplaces and organizations need to more directly address crisis-related challenges and dilemmas by providing statements on expected behavior and ethically acceptable ways of carrying out work tasks during crisis-related assignments. Fifth, news organizations need to strive to create a workplace climate where mental health services are readily available and usage of these services is encouraged and rewarded.

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Part V

Clinical Interventions
for Impacted Individuals

Empirically Based Trauma Therapies

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Posttraumatic stress disorder (PTSD) is a psychiatric disorder that is associated with significant adverse health and life consequences. Researchers have found PTSD to be the most prevalent *Diagnostic and Statistical Manual of Mental Disorders* (DSM) diagnosis following traumas of mass shootings, terrorist attacks, and large-scale acts of violence (Breslau, 2001; Hughes et al., 2011; North, Smith, & Spitznagel, 1994). North, McCutcheon, Spitznagel, and Smith (2002) conducted a three-year follow-up study examining prevalence rates of psychopathology in survivors of a mass shooting incident in Texas. Consistent with the PTSD literature, they found that rates of PTSD were most prevalent 1 month after the shooting and decreased over time. However, those who did not recover reported increased symptoms over time, emphasizing how crucial it is to provide evidence-based treatments to individuals who do not recover naturally. Fortunately, treatment research from the past three decades has yielded significant advances in the psychotherapeutic and psychopharmacological interventions for PTSD. Specifically, there is compelling evidence that cognitive-behavioral therapies (CBTs) and selective serotonin reuptake inhibitors (SSRIs) are effective in reducing PTSD symptomology, with treatment gains from CBT maintained at follow-ups of a year or more (see Taylor et al., 2003).

Researchers and clinicians determine the value of a given PTSD treatment primarily through the use of randomized control trials (RCTs). RCTs are designed to demonstrate that the observed outcomes of a specific treatment can be attributed to that specific treatment rather than to extraneous variables such as expectancy (Kraemer, 2004). Evidence-based treatments for PTSD include Prolonged Exposure Therapy (PE; Foa, Rothbaum, Riggs, & Murdock, 1991; Foa, Dancu, et al., 1999; Foa et al., 2005), Cognitive Processing Therapy (CPT; Resick & Schnicke, 1993), Eye Movement Desensitization and Reprocessing (EMDR; Rothbaum, Astin, & Marsteller, 2005), and sertraline and paroxetine, both of which are SSRIs (Ahearn,

Juergens, Cordes, Becker, & Krahn, 2011). While there is a dearth of RCTs specifically focusing on individuals with PTSD from mass shootings, results from a recent meta-analysis indicate that the type of trauma experienced (e.g. combat/terror, childhood sexual abuse, sexual assault, natural disaster) did not affect treatment response to PTSD-specific treatments (Powers, Halpern, Ferenschak, Gillihan, & Foa, 2010).

In this chapter, we will discuss psychosocial treatments first, and then we will describe pharmacological interventions for PTSD. We will start with PE, discussing its theoretical basis, empirical support, and key treatment components. We will do the same for CPT and EMDR. Following the discussion of CBTs for PTSD, we present a case study to illustrate how treatment can be applied to individuals with PTSD from a mass shooting incident, using PE as the sample treatment approach. Lastly, we will briefly discuss the empirical support for SSRIs as a pharmacological treatment approach for PTSD.

Prolonged Exposure Therapy

Theoretical basis

PE is an evidence-based CBT proven to be a reliable and safe intervention for individuals with PTSD (van Minnen, Harned, Zoellner, & Mills, 2012). PE is based on the Emotional Processing Theory (EPT) developed by Foa and Kozak (1985, 1986). This theory suggests that emotions such as fear are encoded in memory in the form of cognitive networks. Fear networks are hypothesized to contain three important types of information: (1) information about the feared stimuli or situation; (2) information about the person's response to the feared stimuli or situation; and (3) information about the meaning of the feared stimuli and the consequent response (Foa & Kozak, 1986).

Foa, Steketee, and Rothbaum (1989) and Foa and Cahill (2001) posited that the fear networks of individuals with PTSD differ from the fear networks of individuals with other anxiety disorders in several key ways. First, the fear network of individuals with PTSD is larger, because it contains a greater number of erroneous or inaccurate connections between stimulus, response, and meaning elements. Second, the network is more easily activated by stimulus, response, or meaning elements. Third, the affective and physiological response elements of the networks are more intense. Accordingly, stimuli reminiscent of the traumatic experience activate the fear network and prompt states of high sympathetic arousal (e.g., increased heart rate and blood pressure, sweating, muscle tension), retrieval of fear-related memories (e.g., intrusive memories, dissociative flashbacks), intense feelings of fear and anxiety, and fear-related behavioral acts (e.g., avoidance or escape behaviors, hypervigilant behaviors).

According to PE, the mechanisms of therapeutic recovery are activation of the fear network and incorporation of disconfirming information (Cahill & Foa, 2007). Persistent avoidance of trauma-related stimuli prevents the activation of the fear structure and the incorporation of information that disconfirms the expected harm. Thus, the principal aim of PE is to facilitate new learning by helping patients confront trauma-related thoughts, memories, feelings, objects, and activities in a safe environment (Foa, Huppert, & Cahill, 2006).

Empirical support

Numerous RCTs comparing PE to a waitlist control group or an active treatment condition, like CPT or EMDR, indicate that PE is effective in reducing PTSD symptoms (see Cahill, Rothbaum, Resick & Follette, 2009). Studies have shown that PE leads to significantly greater pre- to posttreatment reductions in PTSD symptomatology when compared to waitlist (e.g., Foa et al., 1991; Foa, Dancu, et al., 1999; Keane, Fairbank, Caddell, & Zimering, 1989; Resick, Nishith, Weaver, Astin, & Feuer, 2002; Rothbaum et al., 2005), supportive counseling (Bryant, Moulds, Guthrie, Dang, & Nixon, 2003; Schnurr et al., 2007), relaxation (Marks, Lovell, Noshirvani, Livanou, & Thrasher, 1998; Taylor et al., 2003; Vaughan et al., 1994), and treatment as usual (Asukai, Saito, Tsuruta, Ogami, & Kishimoto, 2008; Cooper & Clum, 1989; Nacasch et al., 2011).

Often, individuals with PTSD present with additional psychiatric and physical health problems, and PE has demonstrated efficacy with a number of common comorbid disorders, including alcohol dependence (Foa et al., 2013), borderline personality disorder (Harned, Pantalone, Ward-Ciesielski, Lynch, & Linehan, 2011), depression (Hagenaars, Van Minnen, & Hoogduin, 2010), psychosis (van den Berg et al., 2015), and mild to moderate traumatic brain injury (Sripada et al., 2013). Furthermore, PE often reduces or improves secondary features associated with PTSD, such as depression, guilt, and social functioning (Foa, Dancu, et al., 1999; Keane, Marshall, & Taft, 2006; Rauch et al., 2010).

In summary, there is sufficient evidence from RCTs to justify the widespread, routine use of PE for individuals with PTSD and concurrent depressive and anxiety symptoms. Given the large evidence base for PE, prestigious psychological and governmental institutions have identified PE as a first-line treatment for individuals suffering from PTSD (i.e., American Psychiatric Association [APA], 2004; International Society for Traumatic Stress Studies [ISTSS], see Cahill et al., 2009; Department of Veterans Affairs/Department of Defense [VA/DoD], 2010).

Treatment overview

Typically, PE sessions are 90 minutes in length, and a full course of the treatment lasts 10 to 15 sessions. PE is comprised of three main components, as well as two minor components. The core components of PE are “in vivo”

exposure, which refers to real-life interaction with trauma reminders, “imaginal” exposure, which refers to the patient’s revisiting of the trauma memory, and processing of imaginal exposure, which is the time where patients reevaluate negative trauma-related cognitions about themselves, others, and the world. The other components of PE include training in controlled breathing and psychoeducation about the nature of trauma reactions and the rationale for exposure therapy (Foa, Hembree, & Rothbaum, 2007).

Detailed treatment approach

Session 1 The first session entails exploration of the effects of the traumatic experience and the subsequent development of PTSD with the patient. In addition, the therapist provides the rationale underlying PE and the processes by which it reduces PTSD symptoms. The therapist explains to the patient that their posttrauma difficulties are maintained primarily by two factors: avoidance of thinking or talking about the trauma and avoidance of situations, people, places, and so forth that are trauma reminders. The therapist explains that avoidance helps by decreasing distress or anxiety in the short run, but it maintains PTSD symptoms in the long run. Specifically, avoidance of thinking about the trauma prevents the individual from processing the traumatic memory, organizing it, and gaining present perspective about it. The second factor that maintains PTSD is unrealistic, negative perceptions about oneself as “entirely incompetent” and the world as “entirely dangerous.” These perceptions are further maintained by avoidance, since avoidance does not allow patients to experience any disconfirmation of such negative beliefs.

After discussing the rationale for PE, the therapist conducts an interview to acquire information about trauma history, identify the most distressing trauma memory (which will be the focus of the imaginal exposure), and identify the beginning and end points of the trauma for imaginal exposure. This first session then ends with breathing retraining and assignment of homework.

Session 2 Session 2 begins with a discussion about the common reactions to trauma, which helps to normalize the patient’s symptoms and other reactions they have had since the trauma. This is followed by rationale for in vivo exposure and generating a list of situations and objects that the patient avoids because they are related to the trauma. These are ordered in a hierarchy from the least distressing to the most distressing, on a scale ranging from 0 to 100, according to the patient’s assessment of the amount of distress they would feel when confronting these avoided situations. This list is used by the patient and the therapist to select the in vivo assignments for homework each week, ensuring that items selected for homework generate at least a moderate level of distress. The patient is instructed to remain in the avoided situation until their distress level decreases by about half.

Session 3 At Session 3, the therapist introduces the rationale for imaginal exposure, followed by the patient’s first imaginal exposure in session. Specifically,

the patient is asked to recount the traumatic memory that was selected in Session 1 for about 30–45 minutes, repeatedly within this time frame if necessary. The narrative is audiotaped, and homework includes listening to the recording daily. Imaginal exposure is followed by processing this exercise, with the patient and therapist discussing the experience of revisiting the trauma and any feelings or insights that may have emerged during the imaginal exposure.

Sessions 4–5 Sessions 4 and 5 of PE are identical to Session 3 with the exception that the rationale for imaginal exposure is not presented in these sessions.

Sessions 6–9 From Session 6 onward, imaginal exposure is conducted for about 30–45 minutes, followed by a time of processing. During these sessions, however, “hotspots” are targeted, which refer to parts of the trauma that have been identified as the most *currently* distressing parts of the trauma memory for the patient. These “hot spots” are introduced after the client has had a few imaginal sessions where they have experienced habituation to less distressing parts of the memory.

Session 10 At the final session, the therapist has the patient recount the entire memory for about 20–30 minutes, pulling all of the parts of the memory back together. The patient is therefore able to narrate the newly organized memory. When the patient is finished, the therapist provides encouragement to the patient, and also asks the patient to identify the difference between this final retelling as compared to the initial imaginal exposure. The patient is prompted to describe what differences they notice in how they feel now as compared to how they felt after doing it for the first time, accompanied by reviewing what they have learned in the course of PE, what has changed or improved, and what they need to continue to work on in order to maintain their gains.

To summarize, PE for PTSD is an extensively validated and effective treatment. Therapy is goal-oriented, time-limited, and focused on the present. It begins with a thorough assessment of the symptoms of PTSD, and then addresses these symptoms through exposures. In the majority of cases, patients who have completed a course of PE have learned how to better manage their PTSD symptoms, understanding that avoidance leads to continued fear, and therefore facing the trauma and trauma reminders promotes recovery and mastery.

Cognitive Processing Therapy

Theoretical basis

CPT is another evidence-based CBT designed specifically to treat PTSD and comorbid symptoms (Resick & Schnicke, 1992). The underlying theory serving as a basis of CPT, the cognitive trauma theory of PTSD, posits that avoidance and

problematic appraisals of the trauma lead to the onset and maintenance of PTSD (Resick & Schnicke, 1993). The authors assert that therapy should target two main “stuck points,” or patterns of thinking, that interfere with natural recovery. The first stuck point is assimilation and the second is overaccommodation.

Resick and Schnicke (1993) explain that assimilation occurs when individuals try to make sense of their traumatic experience by incorporating it into previously held beliefs about the self, others, and the world. Overaccommodation occurs when an individual modifies an existing schema inaccurately or by overgeneralizing. In treatment, biased beliefs about the cause or meaning of the event (assimilation) and overgeneralized beliefs about the self, others, or the world (overaccommodation) are directly challenged and modified, leading to a reduction in the emotions (e.g. guilt, anger, shame) that are manufactured by erroneous beliefs. Adaptive reconciliation of the trauma with one’s beliefs and cognitions facilitates the reduction of natural emotional reactions (e.g. fear, horror, grief) to the trauma, as well. A principal goal of CPT is to help patients integrate new information with previously existing cognitive schemas in a more context-specific, adaptive way.

Empirical support

While PE has the most evidence to support its efficacy, CPT has also amassed considerable evidence supporting its efficacy in reducing PTSD and related symptoms (e.g., Owens, Pike, & Chard, 2001; Resick, Williams, Suvak, Monson, & Gradus, 2012; Sobel, Resick, & Rabalais, 2009). Preliminary research findings demonstrated that receiving a course of CPT improves PTSD symptoms significantly more than a waitlist control group (Resick & Schnicke, 1992). Later studies report that CPT fairs well compared to active treatment conditions, as well. For example, Resick et al. (2002) compared CPT and PE among female rape victims, and the results of the trial showed no statistical differences between CPT and PE on the primary outcome variables of PTSD and depressive symptoms.

As mentioned previously, PTSD can often co-occur with other diagnoses and mental health symptoms. Fortunately, research studies measuring the effects of CPT on PTSD symptoms in individuals with comorbid diagnoses report that those individuals are still able to improve. Individuals with comorbid depression (Liverant, Suvak, Pineles, & Resick, 2012; Resick et al., 2002), borderline personality features (Clarke, Rizvi, & Resick, 2008), traumatic brain injury (TBI; Chard, Schumm, McIlvain, Bailey, & Parkinson, 2011), and alcohol use disorder (Kaysen et al., 2014) show equivalent gains in CPT compared to those without comorbid disorders. Moreover, CPT has demonstrated efficacy in reducing symptoms of depression, guilt, generalized anxiety, and social adjustment (Monson et al., 2006; Resick et al., 2008), and has been associated with improvements in physical health (Galovski, Monson, Bruce, & Resick, 2009).

Since the hallmark component of CPT is cognitive restructuring, Rizvi, Vogt, and Resick (2009) investigated cognition (i.e., level of education, intelligence, age) and mood state (i.e., anger, guilt, depression) factors that are associated with PTSD and their impact on treatment outcome. These variables were hypothesized to affect the ability to adopt new ways of thinking, with the premise that negative mood states may interfere with the processing of traumatic memories. The study demonstrated that level of education, intelligence, and age did not affect treatment efficacy for the entire sample. While these cognitive factors did not affect an individual's ability to improve, several factors (i.e., younger age, lower intelligence, higher trait anger) were related to treatment drop-out. Perhaps counterintuitively, individuals with higher baseline depression and guilt reported more improvement in PTSD symptomatology at posttreatment, and there were no significant effects of anger on posttreatment outcomes. These findings support the conclusion that individuals with various cognitive abilities and mood states can participate in cognitive restructuring and reap the benefits of CPT.

As an important note about the current protocol for CPT, Resick et al. (2008) conducted an RCT dismantling the components of CPT. The results of the study indicated that a CPT protocol with cognitive restructuring and without exposure is as effective as the full CPT protocol that includes an exposure component. Thus, the new version of the CPT protocol omits the impact statement and focuses on cognitive restructuring. The new protocol is referred to as CPT-C and is being more widely tested, but the majority of treatment efficacy findings for CPT use the original protocol.

As with PE, CPT has garnered significant evidence for its efficacy and, therefore, is regarded as a gold-standard treatment for PTSD. CPT, like PE, is endorsed by APA (2004), ISTSS (Cahill et al., 2009), and VA/DoD (2010).

Treatment overview

A full course of CPT can be done individually with a therapist or in a group setting. Individual CPT consists of 12 therapy sessions that last 50–60 minutes. Group-delivered CPT consists of the same number of sessions; however, each session lasts 90 minutes. The first session consists of psychoeducation, which informs the patient of common reactions to trauma and teaches the patient about therapy. In the second session, the patient writes their impact statement. The impact statement is the patient's interpretation of the traumatic event (which serves as an exposure) and is used later in therapy to identify “stuck points” (i.e., distorted beliefs and problematic cognitions). Throughout the subsequent sessions of treatment, the therapist works with the client to challenge their maladaptive self-statements and to modify their extreme beliefs. Examples of common cognitive distortions include concern around the meaning of the trauma (e.g., “I must have deserved this because bad things

don't happen to good people"), the meaning of symptoms resulting from the experience (e.g., "If I were stronger then I would be able to get over this"), the perceived negative reactions of other people (e.g., "People will judge my decisions and think that this is my fault"), and beliefs about future vulnerability to negative events (e.g., "The world is unsafe"; Iverson, King, Cunningham, & Resick, 2015).

The therapist facilitates recovery in session, and also assigns worksheets for homework that reinforce what is being learned in therapy. To measure changes in maladaptive thoughts occurring in the context of PTSD, several commonly used tools are administered at multiple points throughout CPT, including the Trauma and Attachment Belief Scale (TABS; Pearlman, 2003), the Posttraumatic Cognitions Inventory (PTCI; Foa, Ehlers, Clarke, Tolin, & Orsillo, 1999), and the World Assumption Scale (WAS; Janoff-Bulman, 1989). Cognitive distortions are thought to increase and maintain PTSD symptoms largely by increasing avoidance behavior (Dunmore, Clark, & Ehlers, 1999; Ehlers & Clark, 2000; Foa, Ehlers, et al., 1999) and, therefore, CPT is designed to explore and correct maladaptive beliefs resulting as a consequence of the trauma.

Detailed treatment approach

Below is an outline of the CPT treatment manual as is currently used in VA hospitals (Resick, Monson, & Chard, 2014).

Session 1 In Session 1, the therapist works to build rapport with the patient while also educating him/her about the symptoms of PTSD and depression. The therapist should make an effort during this session to normalize any perceived anxiety on the part of the patient. The therapist provides a rationale for the treatment based on the cognitive conceptualization of PTSD. Any questions the patient might have during this session should be answered and the patient should be assured of the robust nature of the treatment. Another goal of Session 1 is to lay out the course of treatment. The therapist spends time discussing treatment compliance with the patient, and should assess the patient's level of motivation and willingness to engage in the treatment. At the end of the session the patient is asked to write, before the next session, one page on why they thought this traumatic event occurred (i.e., impact statement) as well as read the handout on "stuck points." In addition, the therapist asks the patient to offer any feedback or reactions to the session. Any apprehension and/or concerns should be normalized and the patient should be praised for their bravery of taking this step towards recovery.

Session 2 In Session 2, the therapist asks the patient to read their impact statement. The patient and therapist discuss the identified stuck points, which might focus on topics like self-blame and shame. The therapist reviews the patient's

PTSD symptoms and reiterates the theory behind CPT. A-B-C worksheets, which focus on the interaction between thoughts, emotions, and behaviors, are introduced. The homework assigned is the completion of one A-B-C worksheet a day, with one involving the worst trauma.

Session 3 In Session 3, the A-B-C homework is reviewed and stuck points discussed, with some focus placed on assimilation. The event is reviewed in session, and the patient is assisted in labeling thoughts and emotions connected to the events. The therapist begins to use Socratic questioning to help the patient begin to look more closely at the accuracy of their beliefs about the trauma, especially as connected to topics such as self-blame and guilt. The therapist asks questions such as “what do you mean when you say you’re to blame?”, “what would you say to your best friend if they were in your shoes?”, and “what would it mean if you gave up that belief?” The patient is asked to complete another A-B-C worksheet, and the homework of writing the trauma account is assigned.

Session 4 During the next session, the therapist asks the patient to read their trauma account out loud with emotional expression. The therapist identifies certain stuck points as the patient reads aloud, and utilizes more Socratic questions to help the patient challenge their self-blame. The therapist asks the patient questions and makes statements like, “help me understand how a provocative outfit means that you were asking to be raped.” The therapist talks with the patient about the difference between responsibility and blame, which is where the patient may have trouble differentiating. The patient should begin to understand that they were not completely to blame, but they might be struggling to shake the feeling that they were responsible for this. At the end of the session, the patient is instructed to rewrite their trauma memory, and is encouraged to read it daily along with completing the A-B-C sheets daily.

Session 5 In this session, the patient is asked by the therapist to read the newest trauma account aloud and identify differences between the first and second account. The patient is asked more Socratic questions to continue to challenge the self-blame/guilt that they might continue to endorse. The therapist continues cognitive therapy on stuck points for the trauma event. The Challenging Questions worksheet, which helps the patient challenge maladaptive and problematic beliefs, is introduced at the end of this session and it is explained so that the patient can complete it for homework. The patient is asked to challenge one stuck point daily using the worksheet. The patient is also instructed to continue to read the trauma account daily.

Session 6 In this session, the therapist reviews the Challenging Questions worksheet that the patient has completed for homework. The therapist continues

with cognitive strategies to help the patient to challenge stuck points. The therapist introduces the Patterns of Problematic Thinking worksheet and this is explained and assigned for homework. The goal of this worksheet is to have the patient identify problematic thinking patterns. It is assigned to help the patient shift to utilizing Socratic questioning themselves, and should help them to be more supportive of themselves. The trauma account is only reread if the account needed to be reassigned and if it is clinically relevant to read it in session.

Session 7 During this session, the patient and therapist review the Patterns of Problematic Thinking worksheet, and the Challenging Beliefs worksheet with a trauma example is introduced. The Safety Module is also introduced, which helps the patient to discuss safety beliefs that were disrupted or confirmed by the trauma. The patient should be able to see how the trauma influenced his/her beliefs about safety, trust, power/control, esteem, and intimacy, which ultimately influenced his/her behaviors/avoidance. The Challenging Beliefs worksheet helps to challenge these safety beliefs. The homework assigned is to identify stuck points daily, including a safety stuck point with the Challenging Beliefs worksheet. The Safety Module is assigned for reading. The patient should continue reading the trauma accounts if they still have strong emotions about them.

Session 8 During this session, the patient and therapist review the Challenging Beliefs worksheet and the Trust Module is introduced. Stuck points to self-trust and other-trust are explored, as these are both places where a patient might feel unresolved and distressed. For homework, the patient is encouraged to use the Challenging Beliefs worksheet for these trust stuck points. The patient is asked to continue to read the trauma if there is still distress associated with the recounting of the trauma memory.

Session 9 In this session, the Challenging Beliefs worksheet for trauma-related-stuck points is reviewed and the therapist works to generate alternative beliefs with the patient. The module on Power/Control is introduced and these beliefs are explored as related to self and others. The patient continues to practice challenging beliefs with the Challenging Beliefs worksheet.

Session 10 During this session, the therapist helps the patient to gain a balanced view of power/control using the Challenging Beliefs worksheet. Anger issues are also addressed at this session. The module on Esteem is introduced and the assignment for receiving compliments and engaging in pleasurable activities is assigned. The patient is also instructed to challenge stuck points daily, with one relating to esteem issues using the Challenging Beliefs worksheet.

Session 11 Homework reviewed in this session focuses on discussing the patient's reactions to behavioral assignments, such as giving and receiving

compliments and engaging in pleasurable activities. The patient and therapist discuss how it was for the patient to accept compliments and to do things that make him/her happy. The therapist helps the patient to identify and challenge esteem issues and assumptions. The Intimacy module is introduced and the patient is encouraged to identify stuck points, with one that relates to intimacy issues, and confront them using the Challenging Beliefs worksheet. The patient is also asked to write a final impact statement about what it means that they were raped.

Session 12 During this session, the therapist helps the patient identify and challenge any intimacy issues/assumptions, and any remaining stuck points. The patient is asked to read their final impact statement. The therapist reads the original impact statement and differences are compared. The patient should be able to see that their perception of the trauma has completely changed. The therapist involves the patient in reviewing the course of treatment and patient progress. The therapist encourages the patient to continue with behavioral assignments and continue to use the skills they have learned moving forward.

CPT helps patients to process distressing thoughts and memories through cognitive restructuring and helps patients to gain a greater understanding of their traumatic events. By utilizing the skills acquired in this therapy, patients learn where they have become “stuck” in their processing of traumatic events. CPT helps individuals with PTSD to see how the experience of their trauma has changed the way they interpret the world, themselves, and others. Ultimately, the goal is for patients to be able to make new meaning of their traumatic memories, and move forward in their lives with new insight.

Eye Movement Desensitization and Reprocessing

Theoretical basis

EMDR was developed as a short-term, efficacious treatment designed for individuals who are symptomatic following a traumatic experience (Shapiro, 1995, 1996). The original paradigm explaining this therapeutic approach has been revised, and EMDR is now guided by the adaptive information processing (AIP) model, which theorizes how the brain intrinsically processes information and stores memories (Solomon & Shapiro, 2008). AIP posits that there is a physiological information-processing system in place to process new information and organize and store that new information into preexisting memory networks containing related thoughts, images, and emotions (Shapiro & Maxfield, 2002). According to AIP, traumatic memories left insufficiently processed become the basis of distorted thoughts and maladaptive behaviors and reactions

(Shapiro, 2007). In an explanation of the theory and therapeutic components of EMDR, Shapiro and Forrest (2001) assert that the primary goal of EMDR is to facilitate processing of the trauma memory with the underlying hypothesis that processing will facilitate corrections in distorted thoughts and maladaptive behaviors. One of this therapy's distinguishing characteristics is its use of bilateral physical stimulation, such as side-to-side eye movements, alternating hand taps, or alternating auditory tones while the person undergoing treatment is mentally focusing on aspects of various life experiences.

During EMDR, the therapist guides the client through 30-second, dual-stimulation exercises using bilateral eye movements, tones, or taps while the client focuses on the target disturbing experience and then on any related negative thoughts, associations, and body sensations. The AIP model suggests that these dual-attention exercises disrupt the client's stored memory of the trauma to facilitate an elimination of negative beliefs, emotions, and somatic symptoms associated with the memory as it connects with more adaptive information stored in the memory network. Although it would be oversimplistic to assume that one mechanism of action is responsible for EMDR effects, Cahill, Carrigan, and Frueh (1999) state that there is little evidence that eye movements have any impact on standardized, psychometric or physiological outcome measures.

Empirical support

Empirical evidence supports findings of treatment gains in EMDR relative to no treatment control conditions for individuals with PTSD, depressive, and anxiety symptoms (Bisson & Andrew, 2005; Carlson, Chemtob, Rusnak, Hedlund, & Muraoka, 1998; Rothbaum, 1997). However, while several RCTs have found comparable gains in EMDR compared to an active treatment condition (e.g., Devilly & Spence, 1999; Rothbaum et al., 2005; Taylor et al., 2003), it is important to interpret the findings carefully and cautiously. Noted by Bisson and Andrew (2005), a portion of the empirical evidence in support of EMDR does not meet the standards set forth by Foa and Meadows (1997) in which researchers and clinicians should evaluate the methodology of PTSD treatment studies. In a recent meta-analysis, it was mentioned that a large proportion of support comes from studies where the sample size is small, the fidelity for the comparison treatment condition is less stringent than the fidelity of the EMDR condition, and the protocol, specifically the number of EMDR sessions in a full course of treatment, varies (Bisson & Andrew, 2005).

Nevertheless, there is evidence that EMDR is as effective in reducing PTSD symptoms as several active treatment conditions, such as the combination of stress inoculation training and PE (Lee, Gavriel, Drummond, Richards, & Greenwald, 2002) and the combination of exposure and cognitive restructuring (Power et al., 2002). Evidence suggests that EMDR

improves secondary symptoms of trauma, such as depression, dissociative symptoms, and state anxiety (Rothbaum et al., 2005).

As with PE and CPT, EMDR has sufficient evidence to be supported by APA (2004), ISTSS (Cahill et al., 2009), and VA/DoD (2010).

Treatment overview

There are eight phases of EMDR, with Phases 3 through 8 repeated in most sessions. During the first phase, which can last one or two sessions, the therapist collects the patient's trauma history and a treatment plan is developed. The treatment plan includes the specific targets on which to use EMDR (e.g. past and present sources of distress, skills training). Phase 2, lasting between one and four sessions, aims to build the relationship between the therapist and client, set treatment goals and expectations, and familiarize or educate the patient on their symptoms. This phase marks the beginning of skill-based training where patients learn skills that will help them with emotion regulation, impulse control, and general functioning. Phases 3 through 8 involve invoking, processing, and reevaluating the distressing traumatic event(s). EMDR sessions usually range from 50 to 90 minutes in length and a full course of EMDR can be completed in a few sessions or over a period of months based on the individual patient's needs and presenting traumas (Shapiro, 2001).

The eight stages of EMDR as described by Shapiro (2001, 2002) are explained below.

Phase 1 In the first phase of treatment, the therapist takes a full history, which includes gathering information about the patient's trauma, and discusses treatment planning with the patient. The therapist also spends time evaluating the patient's readiness for EMDR. The therapist chooses appropriate trauma memories as the foci (i.e., "targets") for treatment, such as disturbing memories, related historical events, current scenarios that cause distress, and imaginal structures for positive actions in the future. The EMDR treatment plan addresses both the trauma-specific memories and present reminders of the event. These are extrapolated upon in this phase of treatment.

Phase 2 In the second phase of treatment, which is a preparation or stabilization phase, the therapist and the patient work on building rapport, and the therapist provides a rationale for EMDR. The focus is placed on helping the patient build on and utilize personal resources, such as safety, affect management, and self-control before they can address the traumatic memory.

Phase 3 In this phase, the patient begins to process the traumatic memory with a structured clinician-directed assessment of the sensory, cognitive, and affective components connected to the incident. The patient is asked to identify a distressing

memory related to the trauma, identify an irrational negative belief associated with this memory, choose a desired positive belief, and rate the validity of the positive thought when paired with the trauma memory using a 7-point Validity of Cognition (VOC) scale, where 1 “feels completely false” and 7 “feels completely true.” The patient then is asked to combine the image associated with the traumatic memory with the negative belief and rate their Subjective Unit of Disturbance (SUD) level using a 10-point scale, as well as identify any physical sensations related to the trauma along with their bodily location (e.g., racing heart). After this, the patient might identify the emotions of fear and confusion. The intensity of these emotions as well as other emotions experienced during the reactivation of the trauma memory would be assessed using SUD ratings.

Phase 4 During this stage of treatment, the patient is asked to think of the trauma image, the negative belief, and the bodily reactions associated with the trauma memory. The therapist moves their fingers from side to side, approximately 12 inches in front of the patient’s face, while the patient tracks the fingers with their eyes for 15 or more seconds. The therapist can also use auditory tones or hand claps in lieu of eye movements. After the set of eye movements, the therapist stops and asks the patient to let go of the memory, inhale deeply, and asks, “what do you get now?” Following each set of eye movements, the therapist guides the patient as to what to attend to next, which is generally the new material (e.g., image, thought, sensation, emotion). The goal is to support cognitive and/or emotional change. If the patient seems blocked, the therapist may need to intervene with the patient more.

Phase 5 After the patient identifies a SUD rating reduction as far as possible toward zero (i.e., no distress), the positive cognition from Phase 4 is again measured using the VOC scale. The patient is directed to think of the target image while silently rehearsing the positive cognition. Another set of eye movements is conducted, followed by another assessment of the validity of the positive thought. The cycle is repeated until the VOC level climbs as far as possible towards 7 (completely valid).

Phase 6 In this phase, the patient is asked to label any signs of body discomfort or tension while focusing on the negative image and the positive belief. If the patient endorses the aforementioned, this is taken as a sign that the trauma processing is incomplete. Any negative sensations are targeted for processing until the tension dissipates.

Phase 7 This stage focuses on assessing whether the memory has been processed fully and, if not, relaxation or visualization can be used to help a patient reach closure if they are still feeling activated by the memory. The patient is asked to keep a journal of feelings, thoughts, and dreams in between sessions along with applying the coping skills learned.

Phase 8 Phase 8 is defined by reevaluation, where each session that follows the initial session incorporates an assessment of whether the treatment goals have been attained and maintained. Novel trauma-related material that emerges during the course of treatment may be discussed. Sessions are scheduled as needed to help the patient to continue to focus on trauma memories, current triggers, and coping skill acquisition and consolidation.

EMDR utilizes various elements of many effective therapies to maximize the effect of treatment. EMDR integrates these different psychotherapies into a standardized set of procedures and clinical protocols that have been found to be effective for the treatment of PTSD. The treatment focuses on processing historical events, current incidents that cause distress, and future experiences that will require different responses from the patient. EMDR can be effectively used to treat a range of complaints that accompany distressing life events.

Detailed Case Example

In order to more fully exemplify the application of an empirically supported treatment for PTSD, a detailed case example is provided below. PE is chosen as the sample treatment approach, with discussion around how this treatment was used to address PTSD symptoms in a woman who had witnessed a mass shooting at a grade school.

Ms. A is a 27-year-old Caucasian woman who was a teacher at a school during a school shooting. She lived alone at the time of the shooting but after the shooting, she developed PTSD symptoms subsequently leading to most of her nights being spent at her parents' house.

Ms. A's trauma involved hearing gunshots fired in her school, followed by screams of children. During the shooting, she instructed her third-grade students to follow the protocol set in place for a school shooting, and her classroom was not entered by the assailant. After she was told that it was safe to leave the classroom, she took her students out of the building. During the entire event, Ms. A was able to stay calm and ultimately lead her students to safety. She didn't incur any physical injuries as a result of this event. After the shooting, the school was closed for a couple of weeks, and before school sessions resumed, she noticed an increase in anxiety and fear when she realized that she would have to go back to teach. The first day that school resumed, she felt extremely anxious while driving to school and was unable to get out of her car to enter the building. She is presently on a leave of absence from her teaching position, as she was not able to enter the school building. The catalyst for seeking treatment was the fear that she might not be able to teach again.

Ms. A has been feeling more depressed and isolated for the past 3 months, as those are the months that she has not been able to teach, and she has been finding that she is spending more time alone in her room at her parent's house, and not spending much time with friends or colleagues. She has noticed that she is becoming increasingly avoidant of crowds, being alone in her apartment, the school itself, movies or news that references school shootings and any Facebook posts about the event or from other teachers she used to work with. Ms. A stated that her fears had continued to increase since the shooting, and her domains of avoidance were also extending to crowded places or any reminders of that day. She was experiencing frequent intrusive thoughts about the details of the shooting, and the noises she heard, and was experiencing intense emotional distress when reminded of it. Ms. A was also avoiding any thoughts or situations that triggered the memories of the shooting, and she was continuing to experience flashbacks from that day. She also reported having nightmares of the event, accompanied by significant sleep disturbance.

Ms. A had no prior trauma history, and she had no prior psychiatric history or treatment history. She denied any prior or present alcohol or drug abuse at the time of her initial evaluation. She decided to seek help after 3 months of avoidance of school and school-related reminders. The initial evaluation found that Ms. A had moderately severe PTSD, and met criteria for no other diagnoses.

In formulating the treatment plan for Ms. A, the therapist took into account the index trauma (i.e., the school shooting) and helping Ms. A to return to her life as a teacher, which she was completely avoiding. Therefore, imaginal exposure focused on the shooting, where the beginning of the imaginal exposure was hearing the children's screams, followed by shots fired, and ended with exiting the building. Her in vivo exposure hierarchy included items such as going to crowded places, sleeping at home alone, and progressed to looking at pictures of the school, visiting the school, and reading news articles about the shooting.

During the imaginal processing, it became apparent that Ms. A had felt helpless during the shooting. She had always been able to solve the problems that arose in her life, and she was considered by many to be competent in many areas. She had won "teacher of the year" awards in the past, and felt a great sense of responsibility towards her students. She commented several times, "I really thought we were all going to die, and I thought he was going to kill my students." She also felt guilt and shame at the fact that she did not die, or incur any injuries, while other teachers had. She stated that she blamed herself for not being able to recover from this event, and she expressed anger and frustration towards herself and her inability to "get over it and get back in the classroom."

Ms. A displayed appropriate emotional engagement with the trauma memory during her imaginal exposures. She initially reported high distress (SUDS) levels, and showed progressive habituation of distress between and during sessions. Her affect was congruent with her self-report levels. She engaged in productive processing in the latter part of sessions where she would verbalize feelings of guilt, shame, fear, and responsibility. She was able to wrestle with these themes, and came to new realizations such as “I did the best I could, considering the circumstances.” During her sessions she also came to realizations such as “bad things happen sometimes that you can’t control” and “it is hard for me to understand how some people can want to hurt other people.” The patient began to accept that the shooting was a tragic event that was out of her control, and that she did the best she could to deal with it in the moment. She also came to realize that the world can be sometimes dangerous, but it is not always. There was quite a significant shift during treatment in her negative views of herself, the future, and the world, a view that began in response to the shooting.

Ms. A was highly motivated, worked hard in her therapy, was compliant with homework assignments, and practiced the skills she learned in treatment in between sessions. The treatment produced a significant reduction in Ms. A’s PTSD symptoms, and she began to engage in her activities of daily living as she had been able to before the trauma. By the end of treatment, she had plans to begin teaching again in a few weeks after the summer was over. Assessments were conducted before, during, and after treatment, up to a year following therapy. Ms. A’s PTSD severity decreased by 80% from pre- to post-treatment, and a year after treatment the severity had declined by 90%. She continued to maintain her treatment gains. Two years after treatment, her therapist received an email from her, informing her she had started an annual race/fundraiser in honor of the victims of the shooting. She indicated that this was a sign to her that she had successfully moved forward in her life in spite of such a tragedy.

Selective Serotonin Reuptake Inhibitors

Evidence from multisite RCTs has established support for pharmacotherapy as another first-line treatment for PTSD. Specifically, the U.S. Food and Drug Administration (FDA) approved sertraline and paroxetine as pharmacological treatments of choice for PTSD (Friedman & Davidson, 2014). Both sertraline (brand name: Zoloft) and paroxetine (brand names: Pexeva, Paxil) are SSRIs that work by increasing the neurotransmitter serotonin in the synaptic cleft (therefore increasing brain activity stimulated by serotonergic stimulation) by inhibiting its reuptake. Data on several important RCTs are summarized below.

RCTs have demonstrated that SSRIs are safe, well-tolerated, and effective treatments for PTSD in contrast to placebo and can produce remission in 30% of study participants (e.g., Brady et al., 2000; Davidson, Rothbaum, van der Kolk, Sikes, & Farfel, 2001; Londeborg et al., 2001; Marshall, Beebe, Oldham, & Zaninelli, 2001; Tucker & Trautman, 2000). SSRIs meet four independent clinical practice guidelines: (1) reduce reexperiencing, avoidant, and arousal symptoms; (2) produce clinical global improvement; (3) are effective treatments for comorbid disorders, such as depression and panic; and (4) reduce associated symptoms like irritability and impulsivity (Friedman & Davidson, 2014). Additionally, Londeborg et al. (2001) conducted an open-label study that showed remission rates increased from 30 to 55% when sertraline treatment was extended from 12 to 36 weeks. This implies that some nonresponders to acute treatment will respond to continued treatment. Unfortunately, discontinuation of sertraline and fluoxetine (but not paroxetine) was associated with a relapse of PTSD symptoms after several months of treatment discontinuation (Davidson, Pearlstein, et al., 2001; Davidson et al., 2005; Martenyi, Brown, Zhang, Prakash, & Koke, 2002; Rapaport, Endicott, & Clary, 2002). Since these early studies, there have been further RCTs with SSRIs. Based on several reviews, paroxetine, sertraline, and fluoxetine produce statistically significant improvements in PTSD symptoms compared to placebo (Friedman, Davidson, & Stein, 2009; Stein & Ipser, 2011; Stein, Ipser, & Seedat, 2006; Youngner, Rothbaum, & Friedman, 2014).

In spite of this empirical support, however, a number of studies have failed to show any difference compared to placebo (e.g., Brady et al., 2005; Davidson et al., 2006; Friedman, Marmar, Baker, Sikes, & Farfel, 2007; Martenyi, Brown, & Caldwell, 2007; Shalev et al., 2012; Tucker et al., 2001). This inconsistency is perhaps due to the heterogeneity of PTSD, as well as the presence of a clinically significant response to placebo. Furthermore, while four of six clinical practice organizations for PTSD (i.e., APA, 2004; Australian Centre for Posttraumatic Mental Health, 2013; ISTSS, see Cahill et al., 2009; VA/DoD, 2010) recommend SSRIs as first-line monotherapy for PTSD, there are two regulating bodies that do not recommend SSRIs. The first is the Institute of Medicine (IOM; 2012), which excluded a number of studies considered by other organizations because of more stringent criteria regarding methodology and data-analytic strategies. The other organization is the United Kingdom's National Institute for Health and Clinical Excellence (NICE; 2005), which included unpublished studies and did not consider results with an effect size under 0.5 as a positive trial.

To better understand how SSRI monotherapy can be used to treat PTSD, a few small studies have tested whether adjunctive pharmacotherapy might benefit CBT partial responders. Simon and colleagues (2008) randomized PE partial responders (after eight sessions) to PE continuation with and without paroxetine (vs. placebo) augmentation. There was no benefit to the addition of

SSRI treatment. However, two small studies suggest that the reverse design is effective, with partial responders to sertraline showing significant improvement when SSRI treatment was augmented with PE (Otto et al., 2003; Rothbaum et al., 2006).

Unfortunately, there have been no new FDA-approved medications for over 10 years, especially ones designed to target the specific pathophysiology of PTSD. Since large-scale pharmacology trials are expensive, researchers and pharmaceutical companies need to work in conjunction to advance research in a more economical fashion. If the mechanisms of change of existing medications can be better understood, and if a specific medication aimed at correcting the pathophysiological abnormalities associated with PTSD is developed, then, perhaps, psychopharmacology can be a more effective and equivalent first-line option for treatment of PTSD as compared to the efficacious psychotherapies described previously.

Conclusion

PE, CPT, and EMDR have been found to be effective in targeting and reducing symptoms in patients who have been diagnosed with PTSD. These three empirically supported psychosocial treatments have also been found to effectively improve overall functioning in PTSD patients and to help patients maintain treatment gains over time. While SSRIs can be helpful, the effects of the medication have not been shown to last after discontinuation. The evidence-based therapies reviewed in this chapter are recommended for the treatment of individuals with PTSD to improve their functioning and reduce disability associated with the disorder. Victims of mass shootings are at greater risk of suffering from PTSD, and having such evidence-based treatments for providers to implement with these patients is important for effective clinical practice.

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Public Relief Efforts From an International Perspective

Kari Dyregrov, Atle Dyregrov, and Pål Kristensen

The grief and the longing will always be present as long as I live. I will always have him with me. I miss Ben every second and I think very often of him ... I have little energy, lack concentration; I read documents at work for the third time and I wonder if I've understood what they say. I know I am different to before July 22; I am quite sure about that. I have poorer concentration, and I have a lower energy level ... I struggled a lot with sleep problems, but during the last three to four months, I have improved a great deal.

(The mother of an 18-year-old boy shot at Utøya)

In all my nightmares, Karen is taken away from me in one form or another ... it is not happening in a particular place, there are different places. She may show up smiling, then someone drags her away from me, and the closer I get, the further away she goes. I get very scared when I have these nightmares, and sometimes I manage to wake up immediately, while other times I am aware that I have nightmares, but I cannot wake up ... At night I cannot sleep well, because I am tired, and it is such a vicious circle in a way. I cannot rest in the body ...

I had to see the place, because I spoke to Karen on the phone just before she was shot. She cried on the phone, she was scared, and in a way, she knew she would not survive. She asked me what she should do, and I told her, "You must hide, Karen" ... She said she had no place to hide anymore, and she had wet feet, and she froze. She was very scared; she was crying so much ... I asked her to hang up so that she could hide ... "But mom" she repeated, "I have no place to hide anymore." I said, "Karen you must find a place" – and so she hung up on me. When I came to Utøya, I saw that she was right. She had had no place to hide, it was an open place, and I think I gave her the dumbest advice I could have given ... I spoke with Karen at 18.28 [6:28 p.m.] ... and the murderer was detained at 18.34 [6:34 p.m.].

(The mother of a 15-year-old girl shot at Utøya)

The Terror Killings of July 22, 2011

The terror killings were the deadliest onslaught in Norway since World War II, in what has been a largely peaceful country. First, the Norwegian-born ultra-conservative terrorist detonated a 950-kilogram car bomb close to several government buildings in the city of Oslo, killing 8 people and severely injuring 10. Just before the bomb went off, the terrorist drove to Utøya, a small island outside of Oslo, where approximately 550 adolescents and young adults were attending a youth political summer camp for the Norwegian Labor Party. Dressed as a police officer, he lied his way onto a small ferry and crossed to the island. Here, he chased the youngsters all over the island for 1 hour and 20 minutes (between the hours of 5:09 and 6:33 p.m.) with the aim of killing as many as possible. Although the youths attempted to hide, he hunted them and shot them in their hiding places and as they fled, including killing some as they tried to swim to safety. Many wounded individuals who played dead were killed when the terrorist checked his victims for vital signs. During the shooting, many of the desperate – and later murdered – youths were in contact with their shocked parents or siblings via their mobile phones. Their desperate family members tried to comfort them or advise them to flee from the terrorist before they eventually lost contact with them. Before the terrorist was arrested, he had killed 69 individuals, mainly of a young age ($M=21$ years old, ranging from 15 to 51 years old), at close range. In addition, 56 persons were taken to the hospital with injuries that ranged from minor to severe wounds.

The perpetrator was caught alive and a lengthy trial was started 9 months after the incident and lasted 2 months. He was sentenced to 21 years of preventive detention. The event was the main media story for more than a year in Norway, and not a day went by without pictures or stories appearing in newspapers, on the radio or on TV. Furthermore, the Norwegian population took part in a wide range of memorial events in the aftermath of the terror.

The killings on Utøya resulted in approximately 210 parents and siblings losing a child or a sibling. In addition, others lost their partners, parents, other relatives (e.g., uncles, aunts, cousins), or close friends. Thus, this incident directly impacted a large group of individuals.

Present Chapter

As part of a book on mass shootings that incorporates a wide range of topics, this chapter could have dealt with many important issues connected to the Norwegian terror events. Although much help was provided to the survivors, both those who were in the government buildings and those who survived the event at Utøya, we have chosen to focus on the psychosocial follow-up offered to bereaved family members following the Utøya killings. This group was large

and the hardest hit in terms of loss. It can be argued that they were provided the most help and support, and are the group of victims about whom the authors possess special expertise.

It is also important for us to comment on the nature of the events that occurred on July 22, 2011. As has been discussed in great detail in other chapters in this book (see Chapters 1–3), the terms “mass murder” and “mass shooting” can be defined in a number of ways. There is no doubt that the events that happened in Norway on that day should be considered mass murder, given the large number of individuals who were killed. In addition, many definitions require that the incident occur in a public place and both events on July 22, 2011 would satisfy this requirement. Furthermore, the second event on Utøya Island involved a firearm and therefore would meet that criterion of the mass shooting definition. The main area of controversy for this event in relation to these definitions involves the motive. Specifically, the assailant was motivated by his political and religious beliefs, and therefore it is classified as a terrorist attack. However, as was discussed by Fox and Levin in Chapter 3, a motivation-based typology approach to understanding mass shootings would classify the event on Utøya Island as a mass shooting motivated by terror. Regardless, the point of this chapter is to offer a discussion of the psychosocial follow-up provided to bereaved individuals in Norway following a mass murder incident and provide an international perspective on intervention following mass violence incidents that is applicable to mass shootings. The authors of this chapter represent various professional backgrounds (i.e., sociology and psychology), and have decades of research and clinical experience working with the bereaved in the aftermath of traumatic losses. Furthermore, we have been involved in the planning and execution of follow-up programs for the Norwegian health authorities, including disasters that occurred prior to the events of July 22, 2011. In addition, we are conducting a longitudinal research project on the bereaved from this terror event. In this chapter, we draw on our previous and present clinical and research experience.

We first present the history of the development of the Norwegian practice of psychosocial follow-up after critical incidents. Thereafter, the public Norwegian psychosocial follow-up programs that were initiated after the terror attack of July 22, 2011 are sketched out, followed by a discussion of data derived from brief evaluations. The chapter concludes with some basic issues concerning follow-up after unnatural death.

The Development of Psychosocial Follow-Up for the Bereaved in Norway

Prior to the 1980s, crisis psychology and psychosocial follow-up were unknown concepts to the Norwegian population. Conversely, in the past three decades, the field of crisis psychology has been developing in Norway. Psychosocial

follow-up involves comprehensive and need-related assistance. This includes early crisis (e.g., counseling, medication), psychological (e.g., information, cognitive therapy, trauma-specific treatment techniques), social (e.g., mobilization/advice on social networks), practical (e.g., help with care responsibilities), economic (e.g., help with support schemes/subsidies), legal (e.g., legal settlement, inheritance or insurance matters), forensic (e.g., help with rights about autopsy), and religious (e.g., religious counseling, advice from priests or religious groups) interventions.

In the early 1980s, Atle Dyregrov, one of the founders of the Center for Crisis Psychology (CCP), argued for the establishment of emergency teams to provide psychosocial follow-up after large-scale disasters (Dyregrov, A., 1983). He also asserted that crisis teams should be formed to offer psychosocial intervention after single traumatic deaths (Dyregrov, A., 1985). At that time, these ideas fell on deaf ears among health bureaucrats and politicians in Norway. Nonetheless, there were many signs of enthusiasts' hard work with victims after traumatic deaths in local communities. Research has supported the importance of helping communities impacted by traumatic deaths, and gradually the health authorities have taken more responsibility in providing psychosocial follow-up for the bereaved after these types of losses. Thus, there has been a gradual development of public psychosocial follow-up after crises and catastrophes in Norway, for which there are several plausible explanations.

In 1997–1998, the CCP explored how local communities responded to the bereaved after violent deaths (Dyregrov, K., 2002). While we have documented a variety of practices, four major strategies for psychosocial assistance after traumatic deaths were identified among 321 (71%) local communities in Norway. These were: (1) the “prevention strategy” (i.e., early intervention and follow-up), (2) the “treatment strategy” (i.e., intervention after diagnosis), (3) the “ignorance strategy” (i.e., no intervention due to lack of awareness of problems and/or priority), and (4) the “de-medicalization strategy” (i.e., no intervention out of desire to not interfere with and medicalize grief reactions). It is likely that these strategies, which seem to be based on explicit ideologies, also exist in varying degrees and forms in many Western countries today (Dyregrov, K., 2004).

It is documented internationally that the bereaved often ask for help from professionals, social networks, and peers in the wake of traumatic losses (Dyregrov, K., & Dyregrov, A., 2008; Levin, 2004; Price, Jordan, Prior, & Parkes, 2011; Wilson & Clark, 2005). Parallel to the research revealing the great variation in public assistance for the bereaved after traumatic losses, the first nationwide research project on the bereaved was conducted by the CCP. This research documented a distinct discrepancy between the need for help and the help received, as reported by both the helpers and the bereaved (Dyregrov, K., 2002). When asked to describe the ideal form of public help, the bereaved highlighted the following: immediate outreach help from trained personnel,

information about the event and reactions that may arise, help for bereaved children, and the opportunity to meet with others who have experienced similar losses. Because many individuals isolated themselves or lacked the necessary energy, they asked for active outreach from helpers. In addition, the bereaved stressed that if they turned down help shortly after the traumatic loss, offers of help should be respectfully repeated over time. They asked for systems that provided automatic contact from professional teams, stability and continuity in support, competent helpers, and help that was flexible and individually tailored (Dyregrov, K., & Dyregrov, A., 2008).

Emerging international and national studies have shown a high prevalence of anxiety, depression, trauma and complicated grief reactions, and impairment in daily functioning in the bereaved after unnatural deaths (Dyregrov, K., 2003; Li, Precht, Mortensen, & Olsen, 2003; Stroebe, Schut, & Stroebe, 2007). Increased mortality has been documented among those bereaved after unnatural deaths compared to natural deaths (Li et al., 2003), as well as other negative health consequences which are indicated by the presence of symptoms and illnesses (e.g. cancer), and the use of medical services (Stroebe et al., 2007). In addition, individuals bereaved following unnatural deaths stemming from natural disasters demonstrate similar difficulties (Kristensen, Weisæth, & Heir, 2012). For young people, their age, closeness to the event, loss of close persons, lack of support at school, and complex family dynamics are predictors of psychopathology, somatic complaints, behavioral difficulties, and absenteeism from school in the aftermath of terror (Norris et al., 2002). Due to such research, there has been an increasing understanding that those bereaved after unnatural deaths need more assistance than has previously been acknowledged or provided. The increasing knowledge about the risks of developing mental and physical health problems after unnatural deaths has likely contributed to a gradual shift from a strategy of late intervention (i.e., waiting until symptoms arise) to a more active preventative strategy for follow-up.

The gradual shift towards listening more to the “users” of healthcare services has contributed to the development of the follow-up model, making the services more in line with the needs and wishes of the bereaved. In the Norwegian Directory of Health’s report “User Involvement in the Mental Health Field” (Report IS-1315, 2006), a user is defined as “a person who makes use of relevant services in one form or another.” User involvement is defined as “the users’ influence on the development of services” (p. 7) and it is established that “user involvement implies that the public services utilize the users’ experience and knowledge to provide the best possible help” (p. 8).

Due to Norway being a self-declared welfare state, laws and regulations have emerged over the years, leading to the follow-up model that was initiated after the terror of July 22, 2011. In 2000, a law was enacted that paved the way for plans to ensure reliable services during crises and war. This has increased the preparedness and response in local communities for those bereaved after

large-scale events. Nonetheless, for many years, more systematic help initiatives were utilized only when more than one family was affected. In the wake of the tsunami in South East Asia in 2004, in which 84 Norwegians lost their lives, a new trend was implemented whereby general practitioners were asked to contact and follow up with the bereaved and the survivors. Thereafter, the “Comprehensive National Health and Social Preparedness Plan” was enacted in 2007, and the “Guideline for Psychosocial Interventions in Crises, Accidents and Disasters” was launched in August 2011 (Report IS-1810, 2011) and revised in 2015. These guidelines aim at securing high-quality and appropriate psychosocial follow-up after crises and disasters. Also in 2011, the authorities launched the “Guidelines for Follow-Up after Suicide,” signaling an interest in providing help to the bereaved following single-incident traumatic deaths.

Key Governmental Relief Efforts After the Terror of July 22, 2011

This section will cover the key interventions that were offered to the bereaved who lost their children, siblings, parents, and partners at Utøya (for a full overview see Report IS-1984E, 2011). We will review the relief efforts by discussing (a) the information and support center, (b) the national memorials, (c) the proactive model for help in local communities, (d) the visits to the site of death, (e) the weekend gatherings for the bereaved families, and (f) the seminars for school managers and teachers.

Information and support center

In line with previous experiences (Weisæth, 2004), local health authorities established an information and support center at Sundvolden Hotel close to Utøya, immediately after the terror attacks. Thus, from the early evening of July 22, 2011, emergency healthcare was in place. A sympathetic setting with food, refreshments, and privacy rooms was provided for the family members of those individuals who were at Utøya. In the reception center, the bereaved could access help from doctors, psychiatrists, psychologists, nurses, a chaplain, and an imam. There was a fair amount of chaos and a lack of preplanned structure in operating the center, and the local authorities did the best they could. Volunteers and personnel on duty managed to rapidly coordinate and offer services that helped serve the influx of survivors, survivors’ family members, and the bereaved (Dyregrov, A. et al., 2012). The center’s personnel assisted the family members and, together with police, provided information regularly. Gradually, only the family members of those unaccounted for remained at the center. It took approximately a week before all the people who were killed were identified. The functioning of the information and support center has not been formally evaluated.

Memorials

On July 25, 3 days after the terror killings, a national memorial service was arranged in the capital of Oslo and broadcasted live on all three of the major television networks. Famous artists performed, the Norwegian Prime Minister, the King of Norway, and the Mayor of Oslo gave speeches, and the Norwegian Royal Family and Scandinavian royalty attended to pay their last respects to the deceased. On the same day, the citizens of Oslo showed their sympathy for the victims when more than 200,000 participated in a procession with red roses (the symbol of the political party of the murdered youths) raised in the air. All around the country, actions demonstrating sympathy and support were performed during the subsequent weeks (e.g. support concerts, parades). Although many of the bereaved did not partake in memorials due to their grief or because they were still searching for their loved ones, they valued the support and warmth that was shown by the entire population. There were government officials (i.e., ministers) present at all 77 of the funerals following the terror, and they were all covered by the Norwegian government-owned radio and television public broadcasting company.

The proactive model for psychosocial follow-up

On July 22, 2011, the Ministry of Health and Social Care Services assigned the Norwegian Directorate of Health (NDH) to coordinate and secure follow-up for families directly affected by the terror. To inform the services, the NDH established a liaison forum and an expert group to provide advice within the municipalities and the occupational health service.

Through the crisis teams in the municipalities, the health authorities decided to enact a more proactive model for follow-up than previously adopted by local authorities following disasters. The primary features of the model are described in a report by the NDH (Report IS-1984E, 2011). The main aim of the follow-up model was to secure contact and continuity between the bereaved and the health and support services. Another aim was to ensure regular assessment of social support and the need for further actions. To fulfill the aims of reaching out to individuals who needed help, either in the short or the longer term, certain principles were implemented. To ensure that everyone was offered help, the follow-up was proactive and systematic. This was secured through the assignment of a coordinator to work with every family, who preferably had either healthcare or social/educational qualifications. This person initiated contact with the family and offered a personal meeting within the first weeks after the terror killings. If the families turned down the offer at first contact, the coordinator was to repeat the offer later. The coordinator was told to maintain frequent contact initially (weekly), and thereafter adapt to the needs of the family. In the meetings (or phone calls), the contact would assess for the need of and then offer support.

If specialist medical or psychological treatment became necessary, they would refer to an appropriate provider and arrange for the services. The follow-up by the family coordinator was designed to last at least one year.

Based on questionnaires and in-depth interviews, the CCP has evaluated how helpful the bereaved found the follow-up model in the local communities. Compared to those in previous Norwegian studies, the bereaved after the 2011 terror attack expressed a greater need for help and were given more comprehensive and proactive community services (Dyregrov, K., Kristensen, Johnsen, & Dyregrov, A., 2015) than those bereaved by single-incident traumatic deaths (Dyregrov, K., 2002, 2003; Dyregrov, K., Berntsen, & Silviken, 2014). Nearly all the bereaved reported a significant need for help after the terror killings, and during the first year and a half almost all the parents (94%) and siblings (97%) had received help from a range of professionals (Dyregrov, K., Kristensen, Johnsen, & Dyregrov, 2015). The helpers most commonly accessed were psychologists/psychiatrists, general practitioners/medical doctors, the police, family counselors, and teachers/the school. Although psychologists/psychiatrists and general practitioners were the professional groups with which most of the parents and siblings had been in contact, they were also the group of helpers that the family members reported that they wish they had had more contact with. Half of the parents had been contacted by a crisis team, whereas others had been contacted by other groups of healthcare providers. Only a small minority of the bereaved felt that they had lacked help after their loss. Few parents reported that they lacked help for their children, and in line with the bereaved perceiving less need for help over time, they also reported that the relief measures provided to them had been gradually reduced. Despite the fact that 25% of the bereaved reported that the public support services appeared strained and experienced barriers to receiving help, a large majority praised the help that had been provided.

In general, those bereaved after the Utøya terror perceived the community proactive follow-up model as a step in the right direction. As many as 75% stated that, to a large extent or a fairly large extent, they were satisfied with the help received through the community health services. This is a huge improvement compared to the satisfaction of the bereaved with the community follow-up after suicide, accidents, and sudden infant deaths (SIDS) in 1998 (Dyregrov, K., 2002) and 2009 (Dyregrov, K., Bernsten, et al., 2014). Only 34% and 33%, respectively, reported satisfaction at those times.

There may be several reasons why the bereaved after Utøya were more satisfied. First, helpers were more active and initiated contact with families. In addition, families were given a contact person who provided continuity and maintained contact during the follow-up. Second, many of the bereaved received comprehensive and need-related help, and many received help from psychologists and general practitioners, which in previous studies were the most missed and requested types of help. Third, assistance after July 22, 2011

was even offered to the children who were impacted by the event, which was not the case in previous studies. Fourth, the termination of help took place later in time than previously reported by the bereaved, securing better long-term follow-up.

A father who lost his 17-year-old daughter at Utøya explains why this follow-up model was important to his family:

The Crisis Team came to our cabin where we had escaped after the terror, and saw that we were surrounded by a huge social network. They talked with us for some time and found out how we managed. Then they informed us that they would be there for us for whatever need we would have in the days to come – and thereafter they retreated nicely and quietly into the background. It was *very important*, yes ... to know that we had something to fall back on if something happened.

In line with what the bereaved have reported in previous studies and with what was included in the follow-up model after July 22, 2011, more than 80 bereaved parents and siblings stressed the most vital aspects of the follow-up:

- Make contact and offer help.
- Repeat the contact if someone refuses at first.
- Give the bereaved a contact person who can ensure continuity in the support services.
- Make sure the follow-up includes all those biologically or psychologically close to the deceased.
- Base the help on competence and communicate it with empathy.
- Be flexible and listen to what the bereaved need, but take charge when necessary.
- At an early stage, provide the bereaved with clear information about how the death happened, about normal grief reactions, about what will happen next, and where they can receive help.
- Repeat the information.
- Help the bereaved establish contact with a psychologist and/or other necessary professionals.
- Help the bereaved get in contact with others who have experienced the same kind of loss.
- The school and workplace should offer accommodations without the bereaved having to ask.

Visits to the site of death

As has been the tradition for the past three decades in Norway (Kristensen, Tønnessen, Weisæth, & Heir, 2012), the professional expert team of the NDH recommended that the bereaved families be offered the opportunity to visit

Utøya and see the site of death. A total of 360 family members, representing 60 of the deceased, visited Utøya on the first collective visit on August 19, 2011. Thereafter, the authorities arranged four more collective visits (on October 1, 2011, and on the first, second, and third anniversaries of the terror), where an unknown number of the bereaved and survivors, and their families, (re)visited the island. In addition, a significant proportion of the bereaved visited Utøya on their own.

The authorities planned the visit in great detail and organized several caretaking efforts before the first visit in August 2011. Besides cleaning the facilities and having flowers available for every family, a letter was sent to the bereaved families ahead of the visit. In the letter, they received information on what to expect, advice on ritualizing their visit, and how to care for accompanying children. Each family was allowed to bring 10 individuals, including their contact person from their local community if they wanted. Health teams were available on the island.

Two police officers from the National Criminal Investigation Service Norway (KRIPOS) and a volunteer from the Red Cross escorted each family, one by one, to the place where their loved ones had been killed. On the site, the police showed them where the deceased was found and answered questions that the family had about the deaths. Each family was allowed time and space alone at their site (many victims died at the same place), and they were accompanied by qualified personnel with expertise in dealing with such situations. This allowed the bereaved to have a dignified and supported experience. Flowers were available for all to take with them to the site, and memorials had been set up in nearby buildings. Because many had to wait for a while before they could visit “their” site, a large tent was set up with activities for children and food/drink services. Here, the Minister of Health and the Police Director also gave speeches.

In a separate venue, away from but still close to the island, personal effects had been washed and arranged on tables with white tablecloths, which were labeled for each of the deceased. The bereaved who wished to could visit this venue, whereby the police and civil defense had created a very respectful environment. They could take the personal effects of their loved one home if they wanted. Importantly, the families could spend as much or little time at Utøya as they wanted (Kristensen, Dyregrov, & Dyregrov, 2015; Report IS-1984E, 2011).

In a self-report study examining bereaved parents’ and siblings’ experiences of visiting Utøya, nearly two thirds reported that visiting the site of death was both beneficial and a burden, and one third reported that it had only been beneficial. The most commonly reported benefits were an existential/emotional need to see the site, and an increased cognitive clarity about what had happened. Some reported that visiting the site had reduced ruminations and misinterpretations about the circumstances of the death. The most burdensome aspect of the visit was an activation of trauma and grief reactions (Kristensen et al., 2015). Although visiting the site of death can be stressful, it is our conclusion that the

benefits outweigh the burdens. Thus, we recommend that bereaved families be provided the opportunity to visit the site of death after terror events. Such visits can be particularly important for persons who are struggling with complicated grief reactions, such as avoidance of the reality of the death and/or maladaptive grief-related ruminations. However, adequate and thorough preparations are necessary before such collective visits are conducted.

Weekend gatherings

In addition to the help from local communities, the Utøya-bereaved families were offered weekend gatherings by the Norwegian health authorities. The aim of the gatherings was to increase the recognition, understanding, and normalization of grief reactions. In addition, help and advice on how to mobilize social support, cope using psycho-educational methods, and how to live with grief were key objectives.

The NDH gave the CCP the task of developing a plan and a program for providing collective support, and to lead the professional work during these gatherings. In order to deal with more than 250 bereaved, a large and competent organization was needed. Therefore, the gatherings were coordinated within a temporary organization with the NDH as the host responsible for all the practical arrangements, while the CCP set up and designed the professional content of the program in collaboration with other institutions that have worked with traumatic grief. The professional program was outlined in manuals for group leaders for each weekend. The manual for the first weekend contained the philosophy of the program, outlined how to structure the small groups, and described important aspects of how to run the groups. All of the group leaders were selected from institutions familiar with running groups for the bereaved (i.e., CCP, Modum Bad, Ahus Hospital). Regardless of their previous experience with groups, we deemed it important to outline the special issues that were involved in this work. It was stressed that the group work would be different from usual grief groups because the nature of the killings and the magnitude of the event were unprecedented in Norway. A separate manual was developed for group leaders who worked with the young bereaved.

Four weekend gatherings were held in a hotel at 4, 8, 12, and 18 months after the mass killing. In total, 182, 224, 232, and 217 parents and siblings (including stepparents, stepsiblings, and partners of adult children) took part, respectively (Dyregrov, A., Dyregrov, K., Straume, & Grønvold Bugge, 2014; Report IS-1984E, 2011). At each gathering, four group meetings were conducted, each lasting for 1.5 hours, with a total of 16 group sessions occurring across all four gatherings (Dyregrov, A., Dyregrov, K., Straume, & Grønvold Bugge, 2014). In addition, the Red Cross established an activity program for children and adolescents outside of the hours the youngsters spent in the program.

The family gatherings consisted of plenary and parallel sessions, small group meetings, activities for children and adolescents, and informal meeting times. In the small groups (10–12 persons), participants were divided by relational status to the deceased. The weekends usually started on a Friday afternoon with a welcome session and introductions. Each gathering followed the same sequence: a welcome address from the organizers (NHD), a welcome from a representative of the National Support Group, and an introduction to the professional content by the CCP (Dyregrov, A., Dyregrov, K., Straume, & Grønvold Bugge, 2014). The plenary sessions focused on closely defined themes designed to promote self-awareness, normalize experiences, and teach the participants about reaction patterns and coping. The topics that were covered during the sessions with adults were:

- The event, the time that had passed before the first weekend gathering, and the passing of anniversaries.
- Living with grief, differences within the family, and how to support each other.
- How to be a parent (caring capacities) and how to cope with children's grief.
- Challenges with social networks, work and school, and family communication.
- How to optimize social support.
- Advice for parents on young people and issues related to school.
- How to deal with the media and preparation for the court case.
- Reactions to the verdict and the commission report.
- Passing the 1-year mark and commemoration rituals.
- Future perspectives and grief over time.
- Self-help methods.

Importantly, the bereaved received extensive self-help advice and learned how to:

- Restrict the time they think about the deceased and set aside a specific time to approach the loss.
- Make use of imagery techniques to reduce intrusive memories and fantasies.
- Make use of distraction and behavioral activation methods to control attention and improve daily functioning.
- Make use of thought-stopping techniques coupled with setting aside time to approach their grief.
- Learn to monitor and control internal dialogue.
- Take part in social activities to regain their social capacity.
- Use “therapeutic rituals” to limit or end parts of their grief.

- Write letters to their lost loved one where they expressed everything they never had a chance to say or do, ask for forgiveness for things said or done that they regretted.
- “Ask” the dead person for advice or think about what they would have said.
- Give themselves permission to grieve less.
- Seek help if there is no increase in the hours and days where things seem a little better.
- Use sleep techniques and sleep hygiene to improve sleep. (Dyregrov, A., Dyregrov, K., Straume, & Grønvold Bugge, 2014)

A special program was in place for children and adolescents, which was similar in content to the adult program but adjusted for age. Besides talking with other bereaved youngsters, the program contained child-appropriate activities, including arts and sports. The program had more concrete activities than the adult program (e.g., cards for identifying feelings and recognizing grief, use of drawings for smaller children, writing tasks for older children/adolescents). The themes covered in the group sessions included how they learned about what happened, their thoughts and feelings about the killings, the funeral, the media coverage, what had helped them, how best to cope with everyday life, family and social networks, the grief of their parents, school issues, what they had learned, and hopes for the future.

As the CCP had been greatly involved with the program, the NDH undertook the evaluation of the weekend gatherings. They found the response from the participants almost overwhelming with more than 90% reporting that they found the gatherings extremely or very helpful and none who found them counterproductive or unnecessary. The small group sessions were found to be especially helpful by the bereaved, who reported that they had trusted the professional leaders and felt safe to share thoughts and feelings. The participants particularly emphasized the usefulness of being with others who had experienced a loss similar to themselves and having their experience validated (Dyregrov, A., Dyregrov, K., Straume, & Grønvold Bugge, 2014). One parent expressed this in a note to the NDH:

It is intense to go so deeply into one's feelings and experiences related to what happened on July 22nd, but so good to find that I am taken seriously and that I can be with others who lost their loved ones in the same manner as me. I really feel that these gatherings help me in my grief process. I feel stronger and better prepared to handle the future.

Some of the bereaved stated the importance of the firm – but gentle – structure of the gatherings, and commented on the necessity of them being led by people not affected by the terror. During the gatherings, they felt that their experiences and reactions were validated and normalized, they could access information

(e.g., self-help methods), and be helped to integrate their loss. Being with the other bereaved, establishing new ties, and discussing their future challenges assisted them in establishing new life goals. By experiencing the comfort of being with others in “the same” situation, the bereaved found that the gatherings contributed to their resilience and aided them on their way towards a new future (Dyregrov, A. et al., 2014; Rutten et al., 2013).

Seminars for school managers and teachers

Because more than 500 school students survived the terror, the Norwegian Directorate for Education and Training arranged two seminars for schools that each lasted 2 days and included students who were directly involved (i.e., bereaved, survivors). The seminars took place 4 and 8 months after the terror. The aim was to increase awareness and knowledge about the problems that the bereaved or survivors of Utøya might face in the aftermath of the terror, and connect the school leaders/teachers by forming a national discussion network. Through increased knowledge, the teachers became more capable of recognizing problems, and offered support and care to prevent dropouts and minimize learning difficulties among affected schoolchildren.

The seminars consisted of plenary lectures and group work, and specialists from several fields (e.g., education, psychology, sociology, law) covered themes such as:

- Why organize a nationwide school network?
- Cooperation between home and school.
- Flexibility to adapt schooling for affected students within existing school laws and regulations.
- The need for special attention on posttraumatic stress, grief, and school functioning.
- What schools can do to help with school-related difficulties.
- Relevant questions concerning the trial.
- Sharing of experiences locally and regionally.
- Issues related to regulatory practices, especially absences, grading, and testing.
- Sharing of informational resources through websites and written materials.
- Advice given to parents and young people at national and regional gatherings concerning reactions, social support, media, the trial, coping, and so forth.
- How the trial may impact the students and how to handle this in the classroom.
- Questions for the panel of lecturers.

School materials and advice were developed for school personnel, and information was disseminated via websites (Schultz, Langballe, & Raundalen, 2014). A practical step-by-step procedure was recommended for communicating with students, and guidelines were made available to teachers about how to protect students during the lengthy televised trial (Raundalen, Schultz, & Langballe, 2012).

How Are the Bereaved Today?

All previous knowledge has attested that serious and longstanding problems and reduced quality of life could be expected for a high percentage of closely bereaved persons after the terror killings, which constituted the largest national tragedy since World War II for Norway. Therefore, there has been a tremendous determination and effort on the part of the Norwegian authorities to try to minimize the burdens of the many bereaved persons. Nonetheless, in our longitudinal research project on parents, siblings, and close friends bereaved at Utøya, we documented very strong grief and trauma reactions (Dyregrov, K., Dyregrov, A., & Kristensen, 2014; Johnsen, Laberg, Matthiesen, Dyregrov, A., & Dyregrov, K., 2015). Further, the decrease in symptoms and functional impairment for parents and siblings more than three years after the terror killings appears to be occurring rather slowly (Dyregrov, K., Kristensen, & Johnsen, 2015; Kristensen et al., 2015). How can we understand this in light of the huge relief efforts conducted?

There are a number of plausible explanations for the slow recovery. Above all, it may be connected to the extreme nature of the event, imposing a huge burden on, and especially strong trauma and grief reactions in, the bereaved. Second, the bereaved who we are studying are the population most at risk of suffering after traumatic deaths (e.g., parents losing a young child to sudden, unnatural, and violent death). In addition, the bereaved themselves pointed out that grief processing was put on hold for more than a year due to the fact that they had to deal with the media coverage of the events, the trial and conviction of the perpetrator, the commission report, and other related events (Dyregrov, K., Dyregrov, A., & Kristensen, 2014). The bereaved have been surrounded by almost constant reminders, even beyond the first year following the terror. Thus, the recovery may continue, but at a slower pace than has been previously documented in response to other events (Bonanno, Westphal, & Mancini, 2011).

Although we know that the bereaved are very satisfied with the help they have received, we do not know whether the quality or amount of professional help has been optimal for their difficulties. Furthermore, considering the probability that many would need grief and trauma therapy after such an

event, and considering the great variation in professional competence in the field, there were some deficits in the help provided. In line with suggestions from the bereaved, the proactive model for follow-up can be improved by increasing the helpers' competence, improving the "chemistry" between the helpers and the bereaved, and increasing the duration of follow-up (Dyregrov, K., Kristensen, Johnsen, & Dyregrov, A., 2015). Finally, there is a possibility that the bereaved would have been far worse off without all the help measures that were initiated. Our conclusion as to how the measures worked is associated with many questions and uncertainties, which should – preferably – have been answered through efficacy studies. Although efficacy studies are both necessary and desirable, these types of studies on follow-up for those bereaved after large-scale terror pose major ethical and practical challenges. Even so, we have to find ways to evaluate the effectiveness of complex help measures, such as those used after the terror attack in Norway on July 22, 2011.

What Will the Future Bring?

In agreement with one of the bereaved fathers, we would argue that the terror shootings were "a large-scale experiment in the consequence of unprecedented brutality, the consequences of which Norway could not foresee. The authorities had to take this into account when they decided on short- and long-term follow-up, and they could not underestimate what relief measures it would take." Although many preventive measures have been set in place for the bereaved, we cannot know the effects of these measures, or how they will influence reactions over time. We hope that all the assistance efforts have minimized the burdens, and that the future will become brighter – although the bereaved will have to live with their loss:

I hope to go forward ... Yes, I've noticed that life goes forward, very slowly ... but especially when I start to think about what Tom will never experience ... but also not seeing him again ... The pain of not having him around has not decreased the last two years, whatsoever; it has become worse, really. However, I think that it has something to do with the fact that grief was put on hold for over a year, which might have delayed our reactions compared to others who may have had less noise around a death. It is getting better, but surely not very much better. But it's got to be better in the future.

(The father of a 21-year-old man shot at Utøya)

I will certainly not be a paternal grandfather for sure ... I think I will miss Eric my entire life ... I'm thinking of what could have been, he was the most irreplaceable boy for us, he was so nice as a guy, so I'm going to (voice cracking) be reminded

of that my whole life. I think the last person I come to think of when I myself die will be Eric. I think that longing will be the last feeling I have ... when I myself die. I will not be scared, I'm just going to feel a sense of privation, I think.

(The father of a 15-year-old boy shot at Utøya)

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Mental Health Service Utilization Following Mass Shootings

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Epidemiological research conducted in the wake of disasters has demonstrated low rates of mental health (MH) treatment service utilization and high rates of treatment drop-out among those in need of MH services. For example, following Hurricane Katrina, only 18% of people with newly onset disorders and 46% of those with serious difficulties sought MH treatment (Wang et al., 2007). Among survivors of a fire-related disaster, 44% of those in need of MH services sought them (van der Velden, Yzermans, Kleber, & Gersons, 2007). Research conducted following the September 11 terrorist attacks (9/11) reported that 36% of individuals with probable posttraumatic stress disorder (PTSD) sought services (Stuber, Galea, Boscarino, & Schlesinger, 2006). Moreover, among those who do seek MH treatment, high levels of treatment drop-out have been observed (e.g., 60% drop-out rate among Hurricane Katrina survivors who sought MH treatment; Wang et al., 2007). These findings highlight a need to further understand factors and mechanisms that create barriers to care in the wake of mass disasters.

A number of studies and reviews have focused on three dimensions that drive health care utilization in the wake of disasters: (a) predisposing characteristics (e.g., socioeconomic status), (b) enabling resources (e.g., social support), and (c) need (both perceived and evaluated; see review by Rodriguez & Kohn, 2008). These studies have largely been based on Andersen's (1995) behavioral model of health care utilization, providing important insight into factors that correlate with MH service utilization and/or barriers to utilization. Beyond Andersen's model, MH care utilization following mass shootings – as well as individual and community recovery – is influenced by interactions among individual survivors, survivors' social networks, purveyors of MH interventions, and community/societal response to disasters.

Examining interactions among these dimensions may prove helpful in understanding how often individuals seek needed services, mechanisms that drive seeking or nonseeking, and the extent to which MH services effectively meet individual and community treatment needs. Thus, in addition to reviewing and summarizing evidence derived from research that has employed Andersen's (1995) health care utilization model, this chapter explores possible mechanisms that determine MH service utilization related to intraindividual, interpersonal, and sociocontextual factors. By merging what is known from research built on Andersen's model with modern theories of posttraumatic resilience (see Bonanno & Burton, 2013; Maercker & Horn, 2012), the current approach intends to inform future directions and innovation in MH care efficacy following mass shootings. Notably, a review of the literature yielded only one study that examined barriers to MH service utilization specifically following mass shootings (see Schwarz & Kowalski, 1992). As such, the current chapter draws from the disaster literature as a whole. Throughout the chapter, please refer to Table 17.1 for a review of the literature on MH utilization in the wake of disasters.

The Behavioral Model of Health Services

Predisposing characteristics

Demographic characteristics (e.g., age, gender, race, education, income, marital status) are the most frequently examined factors in association with postdisaster MH service use, and findings vary by context. Regarding age, among New York City residents following 9/11, being younger predicted more MH service use (Boscarino, Adams, & Figley, 2004), whereas among other disaster samples (e.g., Manhattan residents following 9/11, Hurricane Katrina survivors) middle-aged survivors were more likely than younger or older to seek MH services (Boscarino, Galea, Ahern, Resnick, & Vlahov, 2002; Wang et al., 2007). Being younger has predicted increased informal help seeking (e.g., help from family, friends, neighbors) across several disaster contexts (Adams, Ford, & Dailey, 2004; Goto, Wilson, Kahana, & Slane, 2002), whereas being older has predicted more formal help seeking (e.g., help from psychologist, physician, psychiatrist, MH counselor; Goto et al., 2002).

Research has also demonstrated that women utilize more postdisaster MH services than men (Boscarino et al., 2002; Tucker, Pfefferbaum, Jeon-Slaughter, Garton, & North, 2014; van der Velden et al., 2007). Women may seek more informal support than men (Adams et al., 2004; Goto et al., 2002), whereas in some cultures and contexts men may be more likely than women to seek formal services (Goto et al., 2002). With regard to marital status, findings vary by context. Specifically, 9/11 and fire-disaster research showed that not being

Table 17.1 Postdisaster mental health treatment seeking and utilization: Organized by Andersen's (1995) behavioral health model of treatment utilization.

<i>Study</i>	<i>Disaster type</i>	<i>Predisposing factors</i>	<i>Enabling/disabling factors</i>	<i>Need</i>
Adams et al., 2004	September 11 terrorist attacks (2001)	More formal MH service use: • Close relationship with victim More informal MH service use: • Age = younger adult • Gender = female	More formal MH service use: • Received informal help More informal MH service use: • Received formal help	More formal MH service use: • Sleep disturbance • Increased postdisaster smoking/drinking More informal MH service use: • 1+ problems (e.g., worry) MH service use: • Panic attack during disaster • PTSD • Depression • Greater exposure to disaster epicenter
Boscarino, Adams, et al., 2004	September 11 terrorist attacks (2001)	More MH service use: • Age = younger		
*Boscarino et al., 2005	September 11 terrorist attacks (2001)	Factors associated with MH service use: • Race • Had a regular doctor		Factors associated with MH service use: • Panic attack during disaster More MH service use: • Greater exposure to disaster
Boscarino, Galea, et al., 2004	September 11 terrorist attacks (2001)	Factors associated with service use: • 4+ lifetime traumatic events • 2+ stressful life events in 12 months prior to disaster • Race More MH service use: • Education = graduate degree		Factors associated with service use: • PTSD • Depression More MH service use: • Increased alcohol use after disaster • Depression

Boscarino et al., 2002	September 11 terrorist attacks (2001)	More MH service use: • Age = 45–64 years • Gender = female • 4+ lifetime traumatic events • 2+ stressful life events in 12 months prior to disaster More MH service use: • Nondisabled • Nonsmoker • Current drinker • Marital status = single • Employed • No increase in smoking since disaster	More MH service use: • Panic attack during event
Ford et al., 2006	September 11 terrorist attacks (2001)	More formal MH service use: • Age = older • Gender = male More informal MH service use: • Age = younger • Gender = female More MH service use: • MH services prior to disaster • Income above \$30k • Had a regular doctor • MH problem prior to disaster • Being in worse physical health	More MH service use: • 1+ poor physical health days per month • 1+ poor MH days per month
Goto et al., 2002	Miyake Island volcanic eruption (2000)	More MH service use: • Higher PTSD and depression severity related to more seeking with physicians, not with psychologists or MH professionals	More MH service use: • Higher PTSD and depression severity related to more seeking with physicians, not with psychologists or MH professionals
*Stuber et al., 2006	September 11 terrorist attacks (2001)	Reasons for not using MH services: • Cost too high • Lack of knowledge • Stigma • Time constraints • Lack of trust in MH system • Fear discussing the disaster	Reasons for not using MH services: • Perceive others need care more than oneself • Perception that oneself and/or social network can provide necessary support

(continued on p. 316)

Table 17.1 (Continued)

<i>Study</i>	<i>Disaster type</i>	<i>Predisposing factors</i>	<i>Enabling/disabling factors</i>	<i>Need</i>
Tucker et al., 2014	Oklahoma City bombing (1995)	More MH service use: • Gender = female • Injury or hospitalization		More MH service use: • PTSD • Depression
van der Velden et al., 2007	Dutch fireworks disaster (2000)	More MH service use: • Gender = female • Marital status = single • Immigrant status • Previous MH service utilization • Predisaster psychological problems	More MH service use: • Having private insurance • Being relocated after disaster	More MH service use: • Comorbid PTSD, anxiety, and depression symptoms
Wang et al., 2007	Hurricane Katrina (2005)	More MH service use: • Age = middle age, 40–59 • Marital status = being married at some point in the lifespan • Owning one's home without a mortgage • Race • Education = low or high levels of education	More MH service use: • Having health insurance Reasons for not using MH services despite need for services: • Lack of available services • Lack of transportation • Lack of financial means • Inconvenience • Stigma • Ineffectiveness of treatment	Reasons for not using MH services despite need for services: • Low need (thinking problem was not severe or would resolve on its own) • Desire to handle problem by oneself

Wang et al., 2008	Hurricane Katrina (2005)	More MH service use: • Race More MH service use: • Having health insurance Reasons for failing to initiate or continue MH services among participants with MH problems: • Lack of available services • Lack of financial means • Stigma • Ineffectiveness of treatment
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Note: * Assessed barriers to care.

married was associated with more MH service use (Ford, Adams, & Dailey, 2006; van der Velden et al., 2007), whereas “being married at any point in the lifespan” was associated with more post-Hurricane Katrina service use (Wang et al., 2007).

Previous research has suggested that ethnic minorities may be less likely than whites to use services (Boscarino, Adams, Stuber, & Galea, 2005; Boscarino, Galea et al., 2004; Wang et al., 2007, 2008). However, in the Dutch fire-disaster sample, holding immigrant status was associated with more MH service use (van der Velden et al., 2007). More education was associated with increased postdisaster MH service use following both 9/11 and Hurricane Katrina (Boscarino, Galea et al., 2004; Wang et al., 2007). However, post-Hurricane Katrina research revealed a less-than-simple relationship between education and MH service use (Wang et al., 2007). Specifically, more MH service use occurred among those with low (e.g., less than high school degree) and high (e.g., college degree) education levels, and less among those with middle education levels (e.g., high school degree). Interestingly, only one study has demonstrated income as a predictor of postdisaster MH service utilization (Stuber et al., 2006). Other factors associated with more postdisaster MH service use include being employed and nondisabled (Ford et al., 2006), as well as owning a home (Wang et al., 2007).

Additionally, increased postdisaster MH service use was associated with more severe trauma history (i.e., experiencing four or more traumatic events), recent history of stressful events (Boscarino et al., 2002), and having a closer social relationship with a disaster victim (Adams et al., 2004). MH service use prior to disaster, predisaster MH problems, being in worse physical health, being injured or hospitalized, and having a regular doctor have promoted more MH service seeking across several postdisaster contexts (Boscarino et al., 2005; Stuber et al., 2006; Tucker et al., 2014; van der Velden et al., 2007).

Enabling and disabling characteristics

The studies that have specifically focused on barriers to care post-9/11 (Stuber et al., 2006) and post-Hurricane Katrina (Wang et al., 2007, 2008) provide the most comprehensive findings associated with factors that enable and disable MH service use. Wang and colleagues (2007, 2008) found that lack of available services, lack of transportation, lack of financial means, inconvenience, fear of stigma, and perceived ineffectiveness of treatment were reasons for not using MH services despite having a perceived need for such services. In the wake of 9/11, Stuber and colleagues (2006) identified the following reasons for not seeking services: cost too high, lacking knowledge about how to get

help, fear of stigma, time constraints, lack of trust in MH professionals, and fear of discussing the disaster. Conversely, having health insurance promoted MH service use across various disasters samples (Wang et al., 2007, 2008; van der Velden et al., 2007). Further, Adams and colleagues (2004) demonstrated a possible reciprocal enabling relationship showing that receiving informal help may lead to more formal help seeking, and vice versa. Whereas income has only been supported as a predictor of MH service in one known postdisaster study (Stuber et al., 2006), perception of cost and/or perceived lack of financial means have been supported as barriers to care among disaster survivors (Stuber et al., 2006; Wang et al., 2007, 2008).

Need

Need is recognized as the strongest indicator of MH services use (Andersen, 1995; Parslow & Jorm, 2000). Ample data suggest that a variety of psychopathology-related factors increase MH service use (e.g., PTSD, depression, comorbid disorders; Boscarino, Adams, et al., 2004; Boscarino, Galea, et al., 2004; Tucker et al., 2014; van der Velden et al., 2007). Some research has demonstrated that in the acute aftermath of a disaster, neither PTSD nor depression predicted MH service use (Boscarino et al., 2002). Other research has supported that having any mental or physical health concerns, lower self-esteem (Boscarino, Adams, et al., 2004), and increased postdisaster alcohol use (Boscarino, Galea, et al., 2004) were associated with more service use (Ford et al., 2006).

Peri-traumatic factors and experiences have also been found to be associated with MH service use. Following 9/11, research demonstrated that higher exposure (e.g., being in closer physical proximity) was associated with (Boscarino, Adams, et al., 2004) and predicted (Boscarino et al., 2005) more MH service use. Additionally, having had a panic attack during the 9/11 terrorist attacks was associated with more postdisaster MH service use (Boscarino, Adams, et al., 2004; Boscarino et al., 2005; Boscarino et al., 2002).

The barriers to care identified in research conducted following both 9/11 (Stuber et al., 2006) and Hurricane Katrina (Wang et al., 2007) provide important details associated with “need” based factors involved in MH service use. Participants in post-9/11 research reported perceptions that “others need care more than oneself” and “oneself or one’s social network can provide adequate support” as reasons for not seeking MH services (Stuber et al., 2006). Wang and colleagues (2007) reported the following need-based reasons: thinking problems were not severe or would resolve on their own, and desire to handle the problem by oneself.

Factors and Mechanisms That May Confer Barriers to MH Service Use

Intraindividual considerations

The most common reasons that participants endorse for not seeking MH treatment involve attitudinal barriers and low perceived need (Andrade et al., 2000). Additionally, posttrauma psychopathology and phenomenology may be involved in survivors' treatment-seeking decisions following mass shootings (Schwarz & Kowalski, 1992). The following subsections focus on the roles of trauma-induced psychopathology, MH literacy, and attitudinal factors (e.g., stigma) in the process of MH service use following mass shootings.

Psychopathology PTSD is the most widely studied MH outcome in the wake of mass shootings. Hughes and colleagues (2011) demonstrated that 15% of the students sampled in the wake of the Virginia Tech shootings had probable PTSD. Individuals with current symptoms of PTSD, particularly those related to avoidance and reexperiencing symptoms, may be less likely to seek treatment. Evidence and clinical observation indicate that the anticipation of having to confront memories and traumatic reminders may lead individuals with PTSD to avoid seeking treatment (Schwarz & Kowalski, 1992). This may be evident in survivors who have a perceived need for service, yet decide not to seek services due to "fear of discussing the disaster" (Stuber et al., 2006).

A byproduct of traumatic experiences, particularly amid disasters caused by human-malice, is that survivors may begin to view the world as dangerous, unpredictable, and inherently unsafe (Janoff-Bulman, 1989). Following the Virginia Tech shootings, individuals who perceived a lack of control over their outcomes were at greater risk for psychological distress (Grills-Tacquechel, Littleton, & Axsom, 2011), with maintenance of disrupted worldviews leading to more severe psychological outcomes (Smith, Abeyta, Hughes, & Jones, 2015). It is reasonable to suggest that the existential, negative worldview that can follow exposure to mass violence is involved in inhibiting individuals from seeking needed services, although this facet of MH service seeking is yet to be directly tested.

MH literacy The broad MH literature draws an association between low MH literacy and decreased help seeking (Wright, Wright, Perry, & Foote-Ardah, 2007). The concept of MH literacy refers to "knowledge and beliefs about mental disorders which aid in their recognition, management, or prevention" (Jorm et al., 1997, p. 183), and is characterized by five factors: (1) the ability to recognize specific disorders or psychological distress, (2) knowledge about risk factors and causes, (3) knowledge about interventions, including self-help and professional, (4) attitudes that lead to recognition and help-seeking behaviors, and (5) knowledge about how to attain MH resources (Jorm et al., 1997).

Many people may fail to seek help for psychological distress because, although they recognize personal distress, they may not consider their symptoms to be out of the realm of “normal” (Gulliver, Griffiths, & Christensen, 2010). In community surveys, underrecognition of psychological disorders is common (e.g., Dahlberg, Waern, & Runeson, 2008; Wang et al., 2007). For example, an Australian national survey of mental disorders revealed that only one third of participants were able to accurately recognize PTSD symptoms when presented with vignettes that described fictional people portraying actual PTSD symptoms (Reavley & Jorm, 2011).

MH literacy has also been linked to MH treatment-seeking barriers and is predicated on beliefs that individuals can manage symptoms on their own and that treatment is unnecessary (Jorm et al., 2006). Indeed, following both 9/11 and Hurricane Katrina, many individuals who considered seeking MH treatment did not do so because they believed they could handle the problem on their own (Stuber et al., 2006; Wang et al., 2007) or that symptoms would diminish over time (Wang et al., 2007, 2008).

Having a higher degree of MH literacy is also associated with having experience with predisaster MH treatment services. This notion is indirectly supported by mass disaster research that shows that individuals with premorbid MH problems may be more likely to receive formal MH services after a disaster (van der Velden et al., 2007; Stuber et al., 2006). Perhaps previous MH service use results in survivors being better informed about psychological wellbeing and service availability.

Stigma The disaster literature supports stigma as a primary barrier (Stuber et al., 2006; Wang et al., 2007, 2008), perhaps by influencing beliefs about the helpfulness of treatment and the likelihood that individuals will seek treatment (see Yap, Wright, & Jorm, 2011). Self-stigmatizing beliefs center on attitudes that people with MH vulnerabilities and needs are incompetent (Corrigan, 2004). Recent epidemiological survey research (e.g., Yap et al., 2011) demonstrates an association between stronger “beliefs that mental disorders are a sign of weakness” and “less favorable attitudes towards professional MH help seeking.” Higher levels of stigma promote lower perceived need for treatment among those who have MH difficulties, which in turn leads to nonuse of needed MH services (Schomerus et al., 2012). These findings elucidate possible attitudinal barriers that underlie low levels of postdisaster MH service use (e.g., perceptions that “one does not need services” or that “services are ineffective”; Wang et al., 2007).

As noted above, barriers research identifies beliefs regarding “desire to/ability to manage MH symptoms on my own” as a prominent factor in MH services utilization (Stuber et al., 2006; Wang et al., 2007). Further, this idea has been linked to MH literacy with the possibility of having stigma-related implications. For example, individuals who express higher levels of MH stigma

within their personal belief systems prefer to manage MH difficulties on their own (Griffiths, Crisp, Jorm, & Christensen, 2011). Additionally, Jorm and colleagues (2006) reported that individuals who do not believe that their symptoms represent a true underlying condition may believe that MH difficulties can be managed through willpower and that professional help is unnecessary. These same individuals, who maintain underlying beliefs that “MH difficulties are a sign of weakness,” may go on to malign those who do seek treatment.

Interpersonal considerations

Social network dynamics are critically important to recognizing and understanding treatment need and seeking following large-scale disasters. Postdisaster trauma theory (Kaniasty & Norris, 1995) and empirical evidence (Brewin, Andrews, & Valentine, 2000) highlight perceptions of social support availability and receipt of tangible aid from one’s social network as particularly important predictors of MH outcomes. Considering that very little research to date has examined social network dynamics in relation to MH treatment seeking, a good starting point for understanding such dynamics can be gained through research that has focused on understanding sources of social support (e.g., formal vs. informal support seeking). For example, following the Virginia Tech shootings, seeking of social support among informal social networks enabled postshootings recovery through its influence on perceptions of social support availability and self-efficacy (Smith, Donlon, Anderson, Hughes, & Jones, 2015).

Studies conducted following the terrorist attack on Utøya Island, Norway and the Estonia ferry disaster of 1994 demonstrated that disaster survivors often perceived that others cannot truly understand disaster experiences, and that this may be a major barrier to accessing needed informal social support (Thoresen, Jensen, Wentzel-Larsen, & Dyb, 2014; Arnberg, Hultman, Michel, & Lundin, 2013). These findings are consistent with Thoits (2011), who suggested that social support drawn from fellow trauma survivors can be powerful during the coping process through means of shared intimate knowledge of a coexperienced disaster. These findings are perhaps also commensurate with post-9/11 research that demonstrated that a high proportion of participants (43%) who sought emotional support via informal social networks (e.g., friends, family) reported feeling unable to divulge thoughts and feelings due to fear that it would make social network members uncomfortable (Stein et al., 2004), which also harkens conceptual overlap with social constraints theory. Social constraints are defined as any social interaction causing the trauma survivor to feel unsupported, misunderstood, alienated, and/or unable to disclose traumatic experiences (Lepore & Revenson, 2007). Increased social constraints decrease the likelihood of trauma disclosure, thereby decreasing cognitive processing (Lepore, 2001). This may lead survivors to feel stigmatized and isolated, and may keep them from accessing needed MH services.

Sociocontextual considerations

In the wake of mass violence, it is common to see communities rally together to foster collective support and healing. For example, “WE ARE VIRGINIA TECH” became a rallying cry among the Virginia Tech community following the shootings. Similarly, following the Boston Marathon bombings, “BOSTON STRONG” became as much a community identity as it did a statement of encouragement.

Durkheim (1964) suggested that crime (and, to extrapolate, community trauma) has the power to bring together a community. Additionally, Collins (2004) suggested that crime communally experienced holds the power to increase social solidarity. Although community solidarity efforts and campaigns are enacted as a means of building cohesion and enabling survivor recovery/resiliency, polarizing effects can occur that increase barriers to MH service use. The following sections delve into possible pros and cons of such sociocontextual campaigns that may have complex, polarizing effects that can promote and/or deter help seeking and resilience. See Chapter 12 for a more thorough discussion of the impact of mass shootings on communities.

Sociocontextual factors involved in enhancing recovery and help seeking The common understanding that community solidarity campaigns are a recovery-enabling mechanism is partially justified in the literature. For example, increases in solidarity following a traumatic event relate to enhanced pride, resolve, feelings of support, and physical health (Hawdon, Räsänen, Oksanen, & Ryan, 2012; Savage & Russell 2005; Smith & Christakis, 2008). Strengthened social networks as the result of increased solidarity have the power to mitigate the negative effects of a traumatic event via suppression of maladaptive coping and provision of needed physical and emotional resources that promote resilience (Cohen, 2004). Further, community solidarity and social support following a traumatic experience can ameliorate feelings of helplessness and meaninglessness in victims (Walsh, 2007). The literature clearly details a number of benefits associated with increased community and social network solidarity in the enablement of postmass violence recovery.

Sociocontextual factors involved in deterrence of recovery and help seeking Evidence also speaks to less-than-positive outcomes that can be incurred in disaster-affected communities. The social support deterioration deterrence model (Kaniasty & Norris, 1995) was developed in light of the realities that communities and individual perceptions of social support can deteriorate in the wake of disaster, providing theory and evidence for how survivors frequently experience a sense of disillusionment with the support they receive. Support can be experienced as ineffective, inadequate, or disappointing. Conversely, even when support adequately meets the needs of survivors, individuals may view tangible

support as finite and time restricted. In turn, longitudinal erosion of perception of support availability may confer barriers to MH service seeking and utilization that coincides with a decline in expectation for support efficacy and increased interpersonal withdrawal, leading individuals to be less likely to seek help.

Despite the enablement that can occur through increased community solidarity, campaigns can inadvertently increase stigma and decrease treatment-seeking behavior. Strength-based campaigns that advertise a “resilient community” comprised of “resilient individuals” may be empowering for those who feel resilient, while simultaneously disempowering and/or alienating those struggling with MH difficulties, physical health consequences, and traumatic loss. Nurmi, Räsänen, and Oksanen (2011) examined the negative aspects of community solidarity following a shooting incident in Jokela, Finland and found that increased perceptions of community social solidarity led to increased perceived social stigmatization. It seems that as the Jokela community reshaped its identity in the wake of disaster, individual community members struggled to identify themselves within the new posttrauma community. Individual community members were less likely to report being from Jokela when talking with outsiders. “Us” (i.e., those directly exposed to the trauma) versus “them” (i.e., those who were not directly exposed to the trauma) divisions, lack of trust, and alienation grew over time. These findings can be extrapolated to MH service seeking, because MH service providers who were considered “outsiders” may be viewed as less trustworthy in the eyes of the most directly affected (and perhaps most in need) survivors. This suggests the potential power of support that would come from within rather than from outside disaster-affected communities.

Conclusions

This chapter examined the current literature on MH service utilization and barriers to care in the aftermath of disasters. In this chapter we (a) summarized the literature derived from Andersen’s (1995) three-factor behavioral health care model, and (b) extended the literature via introducing intraindividual, interpersonal, and sociocontextual mechanisms that may underlie MH service use and barriers following mass shootings.

The most direct implications of this chapter can be drawn from research that assessed why disaster survivors do not seek MH services, even when they perceived need for such services. Postdisaster research demonstrates the following participant reasons for not using MH services despite having a need: cost, lack of available services and/or knowledge of services, time constraints, lack of trust in the system, fear of discussing the disaster, lack of transportation, lack of financial means, inconvenience, fear of stigma, and perceived ineffectiveness of treatment (Stuber et al., 2006; Wang et al., 2007, 2008).

Each of these reasons for not seeking services despite having a need for help should be considered by those charged with assisting survivors in accessing care. For example, given that cost was consistently reported as a barrier to treatment, creative solutions may be applied. The juxtaposition between the lack of evidence for income as a predictor of MH service use (Stuber et al., 2006) and the perception of cost/perceived lack of financial means as a consistent predictor of MH service use (Stuber et al., 2006; Wang et al., 2007, 2008) suggests several possibilities for ameliorating the impact of this barrier. Perhaps public relations and marketing campaigns can clearly and precisely articulate actual costs of MH services in mass disaster environments, and in doing so, reduce any cost-related uncertainty among survivors. Additionally, considering that health insurance is associated with more MH service seeking in the wake of disasters (van der Velden et al., 2007; Wang et al., 2007, 2008), the introduction of affordable healthcare through recent legislation may influence future help-seeking behavior. The need for strong collaboration between MH advocates, practitioners, and policy makers is of primary importance (Harris, Lieberman, & Marans, 2007).

Another approach to managing postmass shootings MH treatment barriers involves consideration of the role of MH service literacy and attitudes towards MH services. By attending to groups who may not be as MH literate or who maintain more negative beliefs about MH services, clinicians and researchers may have more success in the recruitment and enrollment of these people into MH treatment and research studies. Further, campaigns focused on increasing public awareness of common postdisaster MH difficulties (e.g., PTSD, depression, meaning and motivation difficulties, grief) may not only increase knowledge of available services, but may also reduce stigma through education that normalizes these difficulties. Information that is easy to access and understand may improve literacy and reduce stigma in a manner that encourages MH treatment utilization.

Very few studies have sought to understand the enabling facets of Andersen's (1995) model. Studies that examine social support and MH treatment seeking within formal versus informal networks (Adams et al., 2004; Goto et al., 2002) provide an important starting point for understanding enabling factors. Research that examines informal networks may carry cost-effective implications for reaching large groups of people in the wake of disasters by promoting support structures that naturally occur in communities. Evidence suggests that a possible reciprocal, enabling relationship exists wherein one's initial informal support-seeking efforts may bolster formal MH service seeking and, in turn, promote healthier continued support seeking in informal networks (Adams et al., 2004). Continued empirical and theoretical attention should be paid to enabling dynamics such as these.

Although the Anderson (1995) model has served as a benchmark for identifying treatment-seeking behavior for approximately two decades, future research

aimed at understanding barriers to care and resilience among trauma-affected communities may be bolstered by social psychology applications of understanding social network dynamics in the wake of disasters. For example, empirical applications of social constraints theory (Lepore, 2001; Lepore & Revenson, 2007; Ozer & Weinstein, 2004), social support deterioration deterrence model (Kaniasty & Norris, 1995), social acknowledgement theory (Maercker & Muller, 2004), and social cognitive theory (e.g., Smith, Donlon, et al., 2015) may provide fruitful inroads to understanding enabling facets of social network and sociocontextual interactions that may drive intraindividual responses and facilitate or deter seeking MH treatment services.

Sociocontextual implications are also important to consider. Ample evidence suggests that community cohesion and solidarity can be bolstered in response to mass violence (e.g., Hawdon & Ryan, 2011; Shrum, 2007). However, little is known about how strength-based campaigns, which are initiated with good intentions to combat vulnerability and increase solidarity, may adversely affect those who have been impacted by mass violence. For example, a majority of survivors may experience strength-based community solidarity campaigns as a source of protection from an increased sense of vulnerability and existential crises (see Pyszczynski, Solomon, & Greenberg, 2003). However, those who feel vulnerable rather than strong in the wake of mass violence may experience community-wide solidarity efforts as stigmatizing and alienating in a manner that drives them away from help seeking and communal healing. Notwithstanding the powerful effects and intentions of community resiliency and solidarity campaigns, more attention should be devoted to understanding unintended consequences that result in the alienation of those who are struggling to adapt to life after mass shootings.

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Resiliency and Posttraumatic Growth

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Prior research regarding the consequences of mass shootings, as well as trauma more broadly, has focused on the development of pathology, particularly Posttraumatic Stress Disorder (PTSD). However, recently there has been increased recognition that trauma reactions are more complex than previously thought (Bryant, 2015) and may include aspects that are positive (Tedeschi & Calhoun, 2004). Facilitating healthy outcomes following mass shootings requires not only that we understand maladaptive adjustment following trauma, but also that we develop a more nuanced appreciation of recovery.

We begin this chapter with a brief overview of the typical response to experiences of trauma, highlighting the diagnostic bias toward pathologizing such responses. Next, we describe the information-processing model, which has had a dominant influence in past research on recovery from trauma, and examine its neurobiological underpinnings. With this background, we then summarize the literature regarding resilience, highlighting its essence as a dynamic process that leads to psychologically healthy outcomes. Lastly, we describe recent efforts to examine response to trauma through the lens of posttraumatic growth, an approach that has been enriching the way that researchers and clinicians think about response to trauma. We hope this chapter helps foster constructive responses to mass shootings.

De-Pathologizing Responses to Trauma

Some researchers have noted that examining responses to trauma, such as a mass shooting, through the lens of PTSD is problematic because it pathologizes trauma reactions (Brewin, Lanius, Novac, Schnyder, & Galea, 2009). For individuals exposed to severe trauma, the prototypical response pattern is for symptoms to develop immediately (or within days or weeks) after the trauma,

and then gradually decline over time (Bonanno & Mancini, 2012). Studies undertaken with respect to mass shootings support the view that a majority of individuals impacted by the shooting will naturally recover, returning to pre-shooting symptom levels within months of the trauma (Orcutt, Bonanno, Hannan, & Miron, 2014). These studies suggest that the normative response to trauma involves the presence of some psychological difficulties immediately following the event and that the processing of trauma happens spontaneously (Morina, Wicherts, Lobbrecht, & Priebe, 2014; Orcutt et al., 2014). However, the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (American Psychiatric Association, 2013) classifies PTSD symptoms that occur within 3 days of (and lasting up to a month after) a traumatic experience as Acute Stress Disorder. Therefore, the field identifies psychological difficulties following trauma as a psychological disorder. See Chapter 11 for more on psychopathology following exposure to a mass shooting.

Because posttrauma symptoms are normal and natural, the primary research question might be more appropriately framed as one of “offset” rather than “onset.” That is, why do symptoms resolve for some individuals but not for others (Valentiner, Foa, Riggs, & Gershuny, 1996)?

Information-Processing Models of PTSD

There are several related information-processing models of PTSD that are derived from information-processing theory, which provides an explanation for natural recovery from trauma, as well as for symptom reduction as a result of exposure-based psychotherapies (Foa, Steketee, & Rothbaum, 1989; Litz & Keane, 1989; Thrasher, Dalgleish, & Yule, 1994). In general, these models propose that a traumatic event, such as a mass shooting, confronts the individual with new information that is highly consequential. If the new information contradicts information that is already stored in memory, integration of the new information into memory may be problematic. Symptoms of numbing and avoidance might be viewed as attempts to cope with the problematic information, whereas blame, guilt, intrusions, and reexperiencing symptoms can be viewed as attempts to reconcile the trauma with pretrauma memories. The unprocessed trauma memory is easily activated and results in high levels of fear and arousal until the trauma information is reconciled with pretrauma memories.

Natural recovery following trauma and successful PTSD treatment can be viewed as different paths to achieving the revision of beliefs that ultimately enables resolution of inconsistencies between trauma-related information and pretrauma memories. Treatment approaches influenced by information-processing models include Prolonged Exposure Therapy (Foa, Hembree, & Rothbaum, 2007; Foa, Rothbaum, Riggs, & Murdock, 1991), Cognitive

Processing Therapy (Resick, Nishith, Weaver, Astin, & Feuer, 2002), and Cognitive Therapy for PTSD (Ehlers, Clark, Hackmann, McManus, & Fennell, 2005), all of which are viewed as highly effective (see Stein, Cloitre, et al., 2009, for a review). A central theme of these approaches is that, as trauma-related information and pretrauma memories are integrated, a new understanding is developed and retained in memory, resulting in the resolution of PTSD symptoms. See Chapter 15 for more on empirically supported trauma therapies.

Also consistent with information-processing models of PTSD and effective treatment approaches, Janoff-Bulman and Frantz (1997) proposed that the experience of trauma challenges an individual's basic assumptions about the world, the self, and/or people. The authors argued that trauma recovery processes (whether natural or through treatment) involve "meaning making," or the development of a new system of fundamental beliefs. This development of a new belief system is often viewed as the reconciliation of trauma information with an individual's pretrauma memories (Resick et al., 2002), as posited by information-processing approaches. As discussed further below, meaning making may also be related to resilience and posttraumatic growth.

Neurobiology of PTSD

Recent progress in our understanding of the neurological structures associated with PTSD converges with the information-processing models. This convergence suggests some new lines of inquiry related to resilience and post-traumatic growth.

Shin, Rauch, and Pitman (2006) proposed that three brain regions are particularly important for understanding PTSD. First, PTSD is associated with hyperactivation of the amygdala, often viewed as the emotion center of the brain. High levels of activation in the amygdala are associated with heightened fear (Pissiota et al., 2002; Rauch et al., 1996; Shin et al., 2004). The amygdala plays a central role in threat assessment and, in cooperation with the second brain region (i.e., hippocampus) identified by Shin et al. (2006), is centrally involved in fear conditioning.

The amygdala and hippocampus appear to mediate the development of initial PTSD symptoms. Trauma activates the amygdala and the hippocampus encodes the experience. For a day or so following the trauma, the hippocampus rapidly replays the trauma and consolidates (i.e., stores) it in memory. Activation of the amygdala accompanies and facilitates this consolidation process, and is triggered by recall of the trauma.

A third brain region, the medial prefrontal cortex (mPFC) becomes involved later and appears to be important in the resolution of symptoms. Activity of the amygdala and of the mPFC have an inverse relationship – activation of the

amygdala (such as that underlying a strong fear response) is associated with low levels of activation of the mPFC, whereas deactivation of the amygdala is associated with higher levels of activation in the mPFC.

When a trauma is remembered, the amygdala is reactivated. Successful inhibition of symptoms depends on activation of the mPFC to deactivate the amygdala. Activation of the mPFC appears to reflect the learning that takes place as symptoms resolve, either spontaneously or via successful treatment. For the new learning (and resulting deactivation of the amygdala) to be lasting, the hippocampus must then update the trauma memory – a process called reconsolidation. We speculate that these changes in the mPFC are the neurobiological underpinnings of belief change that takes place during natural recovery and effective treatment.

A fourth brain region, the dorsal anterior cingulate cortex (dACC), is in close communication with the mPFC. High levels of activation and inefficient functioning of the dACC appear to be risk factors for developing PTSD (Shin et al., 2009; Shin et al., 2011). What is known about the dACC (see Etkin, Egner, & Kalisch, 2011) suggests that it is involved in searching for and creating new meaning of the trauma. As meaning making is seen as important for the symptom reduction that occurs during natural recovery and successful treatment following trauma (Resick et al., 2002), we speculate that the dACC may be of particular relevance to the topics of resilience and/or posttraumatic growth.

Recent Developments in “Fear Erasure”: Unknown Implications for Meaning Making and Posttraumatic Growth

The acute response to stress and the subsequent pattern of arousal, avoidance, reexperiencing, and disorganization of mood is normal and natural (Morina et al., 2014; Orcutt et al., 2014). Consistent with this view, attempts to intervene early, such as by using critical incident stress debriefing, appear to be counterproductive and potentially harmful (see Szumilas, Wei, & Kutcher, 2010, for a review). Also consistent with this view, pharmacological interventions that interfere with or attenuate the acute stress response lead to higher levels of PTSD, and interventions that facilitate or enhance the acute stress response generally lead to lower levels of PTSD (see Steckler & Risbrough, 2012, for a review).

However, recent developments in “fear erasure” suggest that PTSD symptoms might also be resolved without the development of new meaning through actively processing the traumatic experience (Brunet et al., 2008; Gamache, Pitman, & Nader, 2012; Schiller et al., 2010). To understand this emerging literature, consider the aforementioned process of reconsolidation, whereby

the hippocampus updates (or reconsolidates) the trauma memory after the trauma is recalled. When new meaning has developed, including meaning that serves an inhibitory function, that new meaning is encoded in the trauma memory. Reconsolidation preserves the fear-activating part of the memory, and potentially updates the memory with new meaning that deactivates fear. However, it appears possible to interfere with reconsolidation both pharmacologically (Brunet et al., 2008; Gamache et al., 2012) and by adapting commonly used psychotherapy procedures (Schiller et al., 2010), with the result that the fear-activating part of the trauma memory is erased, although the declarative memory of the trauma remains intact. This type of resolution of trauma without development of inhibitory learning (and the meaning-making that putatively accompanies it) may sometimes occur spontaneously (Weems et al., 2014). The potential role of this phenomenon with respect to resilience and posttraumatic growth, or perhaps in undermining posttraumatic growth, has not been examined.

Resilience

With that background, we turn to the concept of resilient responses to mass shootings and other traumatic events. In lay terms, resilience denotes the ability to adjust easily to change; thus, a resilient object regains its original shape after being bent or compressed, and a resilient person recovers readily from illness, depression, or adversity (“Resilience,” n.d.). The psychological construct of resilience is less clearly defined, however. In the context of response to a traumatic stressor, resilience has been conceptualized as: (1) the presence of internal or external protective factors (and/or the absence of risk factors), (2) positive outcome (i.e., lack of psychopathology), and (3) a process of adaptation (Dutton & Greene, 2010). In the discussion that follows, we discuss protective factors that appear to confer resilience, as well as a conception of resilience as a process in which the dynamic relationship among protective factors over time ultimately leads to adaptive outcomes. See Chapter 11 for a discussion of risk factors associated with the development of psychopathology following trauma.

Protective Factors Conferring Resilience

Various individual characteristics, both psychological (Connor & Davidson, 2003; Dutton & Greene, 2010) and biological (Charney, 2004), as well as social elements (Dutton & Greene, 2010), have been identified as factors protecting individuals from maladaptive responses to trauma. Psychological characteristics that have been found to confer better adjustment following trauma generally

include hardiness, altruism, self-esteem, internal locus of control, and ego defense (Agaibi & Wilson, 2005). Connor and Davidson (2003) proposed that resilience following crime victimization is found in individuals who are oriented towards goals, are tenacious, trust their instincts, see themselves as adaptable, perceive that they can control their lives, and have spiritual beliefs.

In the mass shooting context, there is specific support for the association of adaptive responses to trauma with self-esteem and internal locus of control. In a study surrounding the 2007 Virginia Tech shootings, Grills-Taquechel, Littleton, and Axsom (2011) found that world assumptions regarding positive self-worth after the shootings predicted less anxiety and greater quality of life postshooting. Furthermore, greater posttrauma beliefs in randomness were associated with greater emotional anxiety, particularly for high exposure subjects, whereas greater beliefs in self-controllability following the shooting were associated with lower physiological anxiety for high exposure (but not low exposure) participants.

Additionally, studies have revealed potential links between biological processes and resilience following an experience of trauma. In particular, the following broad biological domains have been implicated in whether or not an experience of trauma results in the development of PTSD or depression: (1) structural and functional neural plasticity of the brain, (2) emotional reactivity (e.g., startle reflex), (3) neuroendocrine function, (4) lack of symmetry between brain hemispheres, and (5) immune function focused on hypothalamic-pituitary-adrenal axis dysregulation (Dutton & Greene, 2010). Moreover, certain endogenous compounds appear to be related to resilient responses to acute stress (see Charney, 2004; Dutton & Greene, 2010, for reviews).

Finally, the tendency to develop PTSD symptoms following trauma is moderately heritable (Stein, Jang, Taylor, Vernon, & Livesley, 2014). This heritability of risk for PTSD might be explained by associations between psychological factors related to resilience and genes linked to the 5-HTTLPR serotonin transporter (Stein, Campbell-Sills, & Gelernter, 2009). In the context of the 2008 Northern Illinois University campus shooting, Mercer et al. (2012) examined genetic risk factors among females and found that the combination of two genetic polymorphisms (5-HTTLPR and rs25531) was associated with increased posttrauma symptoms about one month after the shooting. Although multiple studies have implicated genes associated with the serotonin system, overall the genetic risk is not yet well understood.

Certain aspects of communities and social networks also have proven to be important protective factors in traumatic circumstances (Dutton & Greene, 2010; Norris & Stevens, 2007). In particular, “community resilience” has been fostered in groups that (1) provide trustworthy information and effective communication; (2) are competent and economically developed; and (3) facilitate connections between survivors and natural social supports such as family and

friends (Norris & Stevens, 2007). Related to these observations, Hobfoll, Watson, et al. (2007) recommended fostering safety and calmness, efficacy and hope, and connectedness as key features in designing effective interventions following mass traumas (Dutton & Greene, 2010).

Resilience as Adaptive Process

In contrast to viewing resilience as a collection of protective factors, Bonanno (2012) defines resilience as a “stable trajectory of healthy functioning in response to a clearly defined event” (p. 753). In so doing, he distinguishes it from both internal and external protective factors measured at a single point in time, and rejects the characterization of resilience as an absence of psychopathology (or an “average” level of adjustment) following trauma as overly simplistic. Instead, based on studies that examine subpopulations of trauma survivors with distinct patterns of responding, Bonanno and colleagues (Bonanno, 2004, 2005; Bonanno & Mancini, 2012) argue that resilience should be conceptualized as one of several possible processes of adaptation that unfolds in the wake of a potentially traumatic event.

Such studies have identified four prototypical patterns of response to extreme stress: (1) *chronic disruption*, involving severe disruption to normal functioning soon after the trauma and periodically for an extended period thereafter; (2) *delayed response*, in which a mild to moderate dysfunctional initial response to a traumatic stressor is followed by more severe dysfunction in the long term; (3) *gradual recovery*, characterized by moderate to severe disruption soon after an acute stressor, with gradual reduction in symptomology in the years following the trauma; and (4) *resilience*, characterized by functioning at or near pretrauma levels for the long term following exposure, although there may be brief, mild impairment in functioning shortly following the traumatic experience (e.g., Bonanno, 2004, 2005). Of these four prototypical trajectories, resilient responding is the most common (Bonanno, 2005).

Orcutt et al. (2014) examined symptom trajectories in response to the February 14, 2008 shooting at Northern Illinois University as part of a study that is noteworthy not only because of the mass shooting context, but also because certain pretrauma symptom measures were available, allowing for an examination of the immediate change in symptoms due to the mass shooting event. Orcutt and colleagues (2014) identified four trajectories of symptoms, though somewhat different than the four trajectories identified by Bonanno (2004). Most of the participants (65%) fit a resilience pattern, with no significant symptoms over the study period (about 2.5 years posttrauma). Compared to the other trajectories, this “minimal impact–resilience” trajectory was associated with lower levels of exposure, less prior trauma history, and more adaptive emotion regulation strategies 1 month trauma.

The second largest group of participants (25%) in the Orcutt et al. (2014) study fit a “high impact–recovery” trajectory, showing minimal symptoms preshooting, moderate symptoms at the 1-month postshooting assessment and returning to a minimal symptom level at the 7-month postshooting and subsequent assessments. The third largest group of participants (8%) fit a “moderate impact–moderate symptoms” trajectory, showing moderate symptoms preshooting, high levels of symptoms at the 1-month postshooting assessment, and a return to moderate symptoms at the 7-month and subsequent assessments. A small portion of the sample (2%) fit the fourth trajectory, characterized as a “chronic dysfunction” trajectory, showing high symptom levels throughout the study period, including at the preshooting assessment.

As noted above, other studies of symptom trajectories over time (e.g., Bonanno & Mancini, 2012) have identified that a small number of individuals respond to trauma with a delayed reaction, showing modest initial symptoms (if any) that worsen significantly at a later time. No delayed onset trajectory was evident in the Orcutt et al. (2014) study.

Caution should be exercised when using these proportions to estimate responses to other mass shooting events, as the Orcutt et al. (2014) study did not include any males and contextual factors (such as severity of exposure) likely affected the number of individuals impacted by the shooting and the duration of symptoms. Overall, however, the results of the Orcutt et al. (2014) study support the view that a majority of individuals impacted by mass shootings will be minimally affected and naturally recover, returning to preshooting symptom levels within months of the trauma.

Posttraumatic Growth

Related to the concept of resilience is the construct of posttraumatic growth. Whereas resilience is characterized by maintaining a stable equilibrium following a traumatic experience (Bonanno, 2004), posttraumatic growth has been heralded as a potential positive psychological outcome of trauma that is profound and transcends pretrauma functioning (Tedeschi & Calhoun, 2004).

There is no broadly accepted definition of posttraumatic growth. A prominent view conceptualizes it as a deeper appreciation of life, coupled with recognition of enhanced intra- and interpersonal relationships that can result from reconstructing a belief system that has been shattered by trauma (Tedeschi & Calhoun, 2004). This perspective is partly based on the idea that trauma challenges survivors’ fundamental beliefs (i.e., that the world is benevolent and meaningful, that the self is worthy) and thereby motivates them to reevaluate such beliefs (Janoff-Bulman, 2010) in light of deeper understandings regarding life’s fragility and their own strength after having persevered through adversity. As observed by Jayawickreme and Blackie (2014), others

have characterized posttraumatic growth as: (1) an increase in psychological wellbeing (Linley & Joseph, 2004); (2) a form of positive personality change resulting from restructuring one's life narrative (Pals & McAdams, 2004), or (3) a two-faceted construct encompassing both illusions of self-enhancement to relieve distress in the short term and functional coping mechanisms that lead to constructive change in the long term (Hobfoll, Hall, et al., 2007; Maercker & Zoellner, 2004).

Most of the research regarding posttraumatic growth has operationalized the construct using the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996), a 21-item self-report scale encompassing the following five dimensions of growth: greater appreciation for life, warmer and more intimate relationships, enhanced sense of personal strength, recognition of new life possibilities, and spiritual development (Jayawickreme & Blackie, 2014). Numerous studies have confirmed the five-factor structure of posttraumatic growth (Brunet, McDonough, Hadd, Crocker, & Sabiston, 2010; Morris, Shakespeare-Finch, Rieck, & Newbery, 2005; Taku, Cann, Calhoun, & Tedeschi, 2008), with one such analysis also finding acceptable fit for a structure comprised of one higher-order construct having five first-order domains (Linley, Andrews, & Joseph, 2007). However, a recent review of cross-cultural research on posttraumatic growth indicated that the factor structure of posttraumatic growth may be culture-dependent, embodying between two and five factors depending on the population examined (Weiss & Berger, 2010). A review of findings using the PTGI and similar measures provides a starting point for our evaluation of the status of the research on posttraumatic growth.

Predictors of Posttraumatic Growth

The possibility that the often-tragic consequences of trauma might be counterbalanced by constructive benefits has engendered a significant amount of research into the nature and correlates of posttraumatic growth. Studies indicate that gender has a small to moderate effect on the level of growth perceived by individuals, with women reporting higher levels of growth than men (Helgeson, Reynolds, & Tomich, 2006; Vishnevsky, Cann, Calhoun, Tedeschi, & Demakis, 2010). In particular, two meta-analyses examining the effect of gender found a small effect of female gender ($r = .08$, $p < .001$; Helgeson et al., 2006) and a small to moderate effect of female gender ($g = .27$, 95% CI [.21, .32]; Vishnevsky et al., 2010), respectively.

Investigations into the relationship between posttraumatic growth and personality traits have yielded inconsistent results. The initial validation studies of the PTGI indicated that posttraumatic growth was related to four of the five primary personality domains (all except neuroticism; Tedeschi & Calhoun, 1996), and a more recent meta-analysis confirmed a lack of relationship

between growth and neuroticism (Helgeson et al., 2006). Furthermore, in two separate meta-analyses, posttraumatic growth was moderately related to optimism (Helgeson et al., 2006; Prati & Pietrantonio, 2009), albeit with relatively small effect sizes. However, in other studies, optimism was unrelated to posttraumatic growth (Lowe, Manove, & Rhodes, 2013; Park, Cohen, & Murch, 1996), although, in one such study, postevent growth scores were predictive of the change in level of optimism between time 1 (preevent) and time 2 (postevent; Park et al., 1996). Similarly, more recent work has failed to discern a relationship between growth and either openness or agreeableness (Garnefski, Kraaij, Schroevers, & Somsen, 2008; Zoellner, Rabe, Karl, & Maercker, 2011). Despite some inconsistencies, posttraumatic growth has generally been found to have modest associations with personality in expected ways.

Other factors that have exhibited a moderate relationship with growth include various forms of coping (with religious coping and positive reappraisal coping producing the largest effect sizes), social support, and spirituality (Helgeson et al., 2006; Prati & Pietrantonio, 2009). The subjective nature of the threat posed by trauma also appears to be an important determinant of posttraumatic growth (Helgeson et al., 2006; Linley & Joseph, 2004). Moreover, posttraumatic growth has been positively associated with centrality of the traumatic event to the life and/or identity of the traumatized person (Blix, Birkeland, Hansen, & Heir, 2015) and disruption in core beliefs (Cann, Calhoun, Tedeschi, Kilmer, et al., 2010). In a recent study examining the effect of core beliefs, rumination, and perceived stressfulness of the traumatic event, reexamination of core beliefs was the strongest predictor of posttraumatic growth (Taku, Cann, Tedeschi & Calhoun, 2015). Notably, these research findings regarding the relationship between core beliefs and posttraumatic growth are reminiscent of the emphasis on meaning making and revision of pretrauma beliefs under information-processing models of PTSD recovery.

Lastly, Tedeschi and Calhoun (2004) have proposed that posttraumatic growth results from constructive cognitive processing of trauma, which they refer to as deliberate rumination. Deliberate rumination consists of repetitive thoughts that are directed toward problem-solving or making sense of the event (Cann et al., 2011; Tedeschi & Calhoun, 2004), as contrasted with unconstructive rumination or brooding, which consists of repetitive thoughts that are automatic and intrusive. Although both deliberate and intrusive rumination have demonstrated positive associations with PTSD symptoms, deliberate rumination has consistently demonstrated positive associations with posttraumatic growth (Cann, Calhoun, Tedeschi, & Solomon, 2010; Cann et al., 2011; Stockton, Hunt, & Joseph, 2011; Taku et al., 2015), whereas the relationship between intrusive rumination and posttraumatic growth has been less consistent (Cann, Calhoun, Tedeschi, & Solomon, 2010; Taku et al., 2015).

Relationship of Posttraumatic Growth to Psychological Outcomes

Some have assumed that posttraumatic growth implies an enhanced level of functioning as compared to the pretrauma state (Zoellner & Maercker, 2006). Instead, posttraumatic growth is a complex construct that is distinct from psychological wellbeing (Tedeschi & Calhoun, 2004). Accordingly, posttraumatic growth can coexist with PTSD symptoms, and it should not be viewed as residing at one end of a continuum of responses to trauma, with PTSD symptoms at the other end (Zoellner & Maercker, 2006).

Tedeschi and Calhoun (2004) assert that the transformative quality of posttraumatic growth results, in part, from the extreme emotion involved in processing a crisis. Consistent with this view, there is evidence indicating that, to a certain extent, higher levels of trauma and posttraumatic distress are associated with greater posttraumatic growth. Several studies have found a curvilinear relationship between posttraumatic growth and trauma/symptom severity (Dekel, Mandl, & Solomon, 2011; Shakespeare-Finch & Lurie-Beck, 2014), such that moderate levels of trauma were associated with the greatest levels of posttraumatic growth. These studies suggest that posttraumatic growth increases with trauma severity and resulting symptomology up to a point, after which it begins to erode.

Despite the aforementioned results, research findings regarding the relationship between posttraumatic psychological adjustment and posttraumatic growth have not been uniform. A meta-analysis of 87 cross-sectional studies found that posttraumatic growth was unrelated to anxiety, quality of life, and global distress (Helgeson et al., 2006). In the same analysis, posttraumatic growth was positively correlated with positive wellbeing and negatively associated with depression, despite the fact that it also was positively related to intrusive/avoidant thoughts about the stressor, a key symptom of PTSD. In contrast, Zoellner and Maercker (2006) reported that the majority of cross-sectional studies have found no significant relationship between posttraumatic growth, and symptoms of PTSD and depression. Lastly, a more recent meta-analysis found a significant positive relationship between posttraumatic growth and PTSD symptoms ($r = .315$, $p < .001$; Shakespeare-Finch & Lurie-Beck, 2014).

In contrast to the previously mentioned findings based on cross-sectional studies, longitudinal studies tend to show a positive, albeit small, association between perceived posttraumatic growth and psychological adjustment (Zoellner & Maercker, 2006), such that higher posttraumatic growth reported at the time of a first assessment predicted decreases in PTSD and depression symptoms at the time of a second assessment. This difference in findings between cross-sectional and longitudinal studies may indicate that posttraumatic growth reflects a process that occurs following trauma exposure rather than a

personal characteristic or a discrete trauma outcome. It may take time following an experience of trauma for perceived posttraumatic growth to be translated into healthier psychological outcomes.

The notion that posttraumatic growth represents a distinct pattern of responding to trauma is supported by the literature. In a meta-analysis of 87 cross-sectional studies, time elapsed since trauma of more than two years was positively related to greater positive wellbeing and lower depression, whereas time elapsed since trauma of less than two years was positively related to anxiety and global distress (Helgeson et al., 2006). Just as resilience appears to reflect one of a number of distinct patterns of response to trauma characterized by a relatively rapid return to baseline functioning (Bonanno, 2012), posttraumatic growth may reflect a separate posttraumatic adjustment process involving high levels of PTSD symptoms in the period shortly after the traumatic event, with gradual resolution of symptoms over time associated with reaching a new and different functional equilibrium. This idea could explain the inconsistent findings observed in the cross-sectional literature.

The idea that posttraumatic growth is a process that contributes to better psychological adjustment over time was tested recently in the mass shooting context. In a longitudinal study, Miron, Orcutt, and Kumpula (2014) examined the relationship between posttraumatic growth approximately one month after the 2008 shooting at Northern Illinois University and probable PTSD reported either acutely (at about one month postshooting) or both acutely and 8 months following the shooting. Contrary to expectations, posttraumatic growth soon after the shooting event predicted contemporaneous probable PTSD as well as probable PTSD 8 months following the shooting. This unexpected result may be attributable to the length of time elapsed between data collections. That is, consistent with the findings of Helgeson et al. (2006) above, the 8-month time frame that elapsed between the shooting event and distal measurement of PTSD symptoms in Miron et al. (2014) may have been too short to detect an effect. In addition, like many studies of posttraumatic growth, Miron et al. (2014) used the PTGI to measure posttraumatic growth. Frazier and colleagues (2009) have argued that the PTGI measures *perceived* posttraumatic growth, rather than actual growth, and that perceived posttraumatic growth is more akin to positive reinterpretation coping than it is a reflection of actual, positive posttraumatic change. Because positive reinterpretation coping and PTSD symptoms both vary with the severity of trauma, the results obtained by Miron et al. (2014) may reflect that, at 8 months following the shooting, the trauma resolution process was at a relatively early stage in which the coping aspects of posttraumatic growth mask its salutary effects.

This interpretation of the results in Miron et al. (2014) is in line with certain alternative conceptualizations of posttraumatic growth. For example, Zoellner and Maercker (2006) posit that perceived posttraumatic growth (such as measured by the PTGI) may encompass both motivated positive illusions, which

tend to be associated with psychological distress, and transcendent aspects, which relate to positive psychological adjustment. Similarly, Hobfoll, Hall, et al. (2007) suggest that measures of perceived growth initially may represent cognitive attempts to reduce the impact of trauma, but true posttraumatic growth (which they term “action-focused” growth) follows only after a survivor has converted growth-related cognitions into practice. As such, Miron et al. (2014) highlight the need for more longitudinal studies of posttraumatic growth, over longer periods of time (Anusic & Yap, 2014; Jayawickreme & Blackie, 2014).

Related to the idea of action-focused posttraumatic growth, system justification theory (Blasi & Jost, 2006; Jost & Banaji, 1994) has some interesting implications. System justification theory proposes that believing that the status quo is fair serves protective psychological functions for the individual, even when the status quo results in social or economic injustice (e.g., discrimination) and works against the individual’s own interests. Confidence that the status quo is inherently just is one type of pretrauma belief that might be challenged by an experience of trauma. If recovery from trauma reflects a revision or reaffirmation of pretrauma beliefs that has been converted into practice, the associated actions could challenge or buttress the status quo, respectively. Thus, for mass shooting traumas, beliefs regarding gun rights and gun control, balancing security and privacy, and attitudes toward individuals with mental illness may come to the fore (Kaminski, Koons-Witt, Thompson, & Weiss, 2010; Kleck, 2009; McGinty, Webster, & Barry, 2013), and individuals’ processing of such traumas may serve as a call to social or political action with respect to such beliefs.

We speculate that the process of reconciling a mass shooting with protective pretrauma beliefs is not only an individual process. To the degree that such beliefs are shared, reconciliation also takes place through public dialogue, social and political action, and cultural change.

Conclusions

Disrupted functioning in the immediate wake of a trauma is normal, and finding equilibrium is a process that takes time. Current recommendations are to allow exposed individuals to regulate their own utilization of intervention services, rather than requiring or strongly encouraging use of such services.

There is evidence that certain individual characteristics are associated with greater likelihood of resilient responses to trauma. Further, some studies indicate that distinct subpopulations of trauma survivors may exist, with each exhibiting its own characteristic trauma response pattern. After a mass shooting event, a minority of individuals in the environment are likely to have difficulties initially. A small number of these individuals will experience more persistent

symptoms. Recovery for some may involve changing important personal beliefs. This process may involve religious and social communities, and include actions that foster social, political, and cultural change. Dialogue in public forums may reflect some individuals' attempts to cope with, recover from, and grow after the shooting event, and has the potential to affect the recovery of others.

Behavioral scientists have a responsibility to examine psychological functioning following mass shooting events. Studies of mass shooting trauma can improve public policy and community response, increase our understanding of how individuals can respond positively, and reduce some of the suffering. Exposed individuals may find participation in trauma-related research to be rewarding, possibly giving meaning to difficult experiences they may have had (see Chapter 20 for more on research participation following mass shootings; Fergus, Rabenhorst, Orcutt, & Valentiner, 2011). Findings from that research may help us to address psychological functioning not only after mass shootings, but also in the wake of other types of trauma.

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Part VI

Prevention, Ethics, and Future Directions

Threat Assessment and Violence Prevention

Dewey Cornell and Pooja Datta

Behavioral threat assessment has emerged over the past two decades as a specialized form of risk assessment concerned with the immediate risk posed by an individual who has threatened to commit an act of violence (Borum, Fein, Vossekuil, & Berglund, 1999; Meloy, Hart, & Hoffman, 2014). A typical threat assessment begins when an individual is reported to have threatened to harm someone or engaged in threatening behavior. A threat assessment team then gathers information to determine whether the person poses a serious risk of violence. Many individuals might threaten violence as an expression of frustration or anger, but lack genuine intent to harm someone. Others might be capable of violence, but the threat could be ameliorated through counseling, conflict mediation, or another intervention that resolves the underlying problem. In the most extreme cases, there may be a very serious threat that requires law enforcement intervention to prevent an imminent attack.

The shift from an initial assessment phase to an intervention phase depends on the seriousness of the threat and the nature of the underlying problem or conflict. For this reason, threat assessment might be described more accurately as threat management and regarded as a problem-solving approach to violence prevention. There are many different threat management strategies, ranging from a simple apology to conflict resolution, counseling to psychiatric hospitalization, and a firm warning by authorities to arrest and criminal charges. In all cases, the overarching goal is to prevent violence by responding to the problem or concern that led to the threatening behavior with an appropriately calibrated risk reduction plan.

Basic Principles

Threat assessment is a relatively new and evolving field of practice that is guided by some general principles. First among these principles is the recognition that there is no single profile or type of individual who threatens and subsequently

commits a violent act (Randazzo et al., 2006). Threat assessment must be distinguished from a profiling approach that seeks to identify violent individuals through a checklist of warning signs or psychological characteristics. Prospective profiling as a means of predicting who will commit a violent act has been widely criticized as an inaccurate process prone to many false positive cases (Sewell & Mendelsohn, 2000). As the FBI's profiling experts concluded, "Trying to draw up a catalogue or 'checklist' of warning signs to detect a potential school shooter can be shortsighted, even dangerous. Such lists, publicized by the media, can end up unfairly labeling many nonviolent students as potentially dangerous" (O'Toole, 2000, p. 2). The heterogeneity of individuals who commit violent acts, in combination with the diversity of environmental factors that could provoke or inhibit violence, render a profiling approach impractical and unrealistic.

A second principle is that there is a critical distinction between making a threat and posing a threat (Randazzo et al., 2006; Vossekuil, Fein, Reddy, Borum, & Modzeleski, 2002). Many individuals make threatening statements that they have no intention of carrying out. Threats may be expressions of anger or sarcasm, and they may represent hyperbole or rhetoric rather than a genuine intent to harm (Cornell & Sheras, 2006). Some threats may be intended to frighten or intimidate, with no intent to follow through on the threatened action (Calhoun & Weston, 2009). A threat assessment team is concerned with identifying the subset of individuals who pose a threat because they have the motivation and the means to carry out their threat. The team should investigate whether the person has acquired weapons, developed a plan, recruited assistance, or engaged in some other preparation to act. Virtually anyone might make a threat, if sufficiently frustrated, but only a small proportion of individuals will take actions that pose a threat.

Conversely, someone can pose a threat without making a threat. A person who is determined to carry out a violent act might refrain from expressing a threat in order to avoid detection, but these cases are relatively rare in comparison to the vast majority of persons who communicate their intentions to harm someone before carrying out an attack (O'Toole, 2000; Vossekuil et al., 2002). The U.S. Secret Service study of school shootings found that many of the students had not directly threatened their intended target, although typically they communicated threats to third parties such as friends or classmates (Vossekuil et al., 2002). The FBI study of school shootings referred to the "leakage" of the individual's intentions through behaviors and statements that reflect an interest in carrying out a violent act (O'Toole, 2000). In Germany, a school shooting prevention program was designed specifically to train teachers to identify leakage of violent intentions among their students and to refer them for a threat assessment (Leuschner et al., *in press*).

A third principle of threat assessment is that a violent attack is not a spontaneous act committed by someone who has "just snapped" (Randazzo et al., 2006).

Although a fight might erupt unexpectedly between two individuals having an argument, mass shootings and other acts of targeted violence are almost always preceded by planning and preparation. Case studies document that individuals contemplate and ruminate, then eventually plan and prepare to carry out the violent attack over a period of weeks, months, or longer (Fein & Vossekuil, 1998; Vossekuil et al., 2002). The importance of this principle is that there is an opportunity for prevention during the time period when a would-be aggressor is preparing to attack.

Pathways to violence

Cornell and Sheras (2006) contended that there are three main pathways to violence that should be considered in a threat assessment. These pathways reflect differences in the motivation and psychological functioning of violent individuals that would be obscured if compared to a single profile or set of warning signs. Several case examples of mass shootings illustrate the opportunities for intervention using a threat assessment approach.

The first and most common pathway to violence involves an act of instrumental violence for personal gain, such as robbery or sexual assault. These acts are most often committed by individuals with an antisocial background, and a history of prior violence and criminal behavior. They tend to affiliate with other like-minded individuals and may be involved in gangs. Their acts of aggression may be motivated by drug dealing, stealing, or another predatory goal. They may have a psychopathic personality characterized by dishonesty, narcissism, and lack of empathy for others. Because these individuals have considerable experience with fighting and other aggressive behaviors, and lack inhibitions against harming others, they have a propensity to use violence in many different situations and with little provocation. For this reason, they may display both reactive and instrumental aggression, although what distinguishes them from other aggressive individuals is their proclivity to engage in instrumental aggression (Cornell et al., 1996). Instrumental violent offenders are not likely to commit a suicidal mass shooting, but could engage in a more instrumental mass shooting against a rival group, such as a gang.

One example of a mass homicide involving gang members was the 2015 shoot-out between rival bike gangs in Waco, Texas. According to news reports, five rival biker gangs congregated at a restaurant to resolve turf and recruitment disputes (Holley, Freedom du Lac, Berman, & Madigan, 2015). Even though this case does not appear to involve a planned act of violence, it occurred in the context of a feud in which the individuals anticipated the potential for violence and came armed with guns and knives. An argument beginning in the restroom escalated into a fight in which nine individuals were killed and 18 injured from gunshot and stab wounds (Fernandez, Kovalski, & Montgomery, 2015).

A more typical instrumental homicide may occur in the context of a planned robbery. For example, in 2015 one or more robbers invaded a home in Washington, DC held three family members and a housekeeper hostage for 19 hours, and tortured a 10-year-old boy in order to coerce the father into obtaining \$40,000 in cash. The assailant(s) then killed the hostages and set the home on fire (Leshan, 2015). These behaviors suggest the actions of a psychopathic individual engaged in predatory, instrumental violence in pursuit of personal gain.

A second, conflict, pathway involves individuals who commit acts of reactive or hostile violence that is less motivated by instrumental gain than by revenge or retaliation. They are often embroiled in an emotional conflict or dispute that they cannot tolerate, and perceive themselves as victims of bullying, harassment, or some other unfair treatment that justifies taking action against others. These conflicts can arise in diverse circumstances, such as a student bullied at school, an employee mistreated by a supervisor, or a person rejected by a romantic interest. The perceived injustice and mistreatment may be grossly exaggerated and the person may develop a generalized resentment of other people or society in general. Individuals with a fragile self-esteem and wounded narcissism may experience the conflict as so demeaning and shameful that they see a dramatic act of violence as the only way to retaliate for their sense of injury.

One example of a conflict-related mass shooting is the 2014 case of a 22-year-old in Isla Vista, California who killed six persons and injured 14 others before he killed himself (Lovett & Nagourney, 2014). According to a law enforcement report (Brown, 2015), the shooter had been shy and anxious in childhood and had symptoms of Asperger's syndrome. He was variously diagnosed with Pervasive Developmental Disorder and Autism, and received mental health treatment and medication throughout his adolescence and until his death. He wrote a 137-page manifesto describing many frustrations and disappointments in life, although his primary motivation appears to have been intense anger that he was unable to find a girlfriend and resentment that women seemed to prefer other young men whom he deemed to be less intelligent and attractive than himself. The shooter decided to carry out a "Day of Retribution," and purchased handguns and practiced for months before his attack. Immediately before carrying out his attack, he uploaded a video to YouTube and sent emails to family members and friends expressing his anger at being rejected by women and describing his plans for revenge. His statements on the video were angry and extreme, but were delivered in a calm and coherent manner with no evidence of delusions or formal thought disorder.

The third pathway to violence is a psychotic pathway traversed by individuals with a severe mental disorder, such as schizophrenia or bipolar disorder. In a psychotic state, they are guided by delusions and/or auditory

hallucinations that justify their actions. One example is the 2007 shooting at Virginia Tech, where a 23-year-old student killed 32 people and wounded 17 others before killing himself (Virginia Tech Review Panel, 2007; Virginia Tech Review Panel Addendum, 2009). The shooter raised concern in middle school when he wrote an essay expressing his admiration for the two high school students who carried out the Columbine shooting. He was notably withdrawn and anxious, and often refused to speak at school. He was identified as severely emotionally disturbed, but obtained good grades and displayed no aggressive behavior in high school. In college, he continued to be shy and withdrawn, and aspired to be a writer. His creative writing instructors repeatedly expressed concern about his odd behavior in class, his readily apparent anger, and his preoccupation with violence in his writings. University authorities sent him for a mental health assessment after several incidents in which he appeared to be stalking female classmates and he was hospitalized overnight after he made a suicidal statement to his roommates. In his final semester before graduation, he purchased handguns and began practicing at a local shooting range. In the week before his attack he made anonymous bomb threats and tested the response of authorities to a chained door. He also made a video manifesto containing angry, rambling statements in which he compared himself to Jesus Christ and described his actions as a heroic act of retaliation against wealthy, materialistic persons who had tormented and tortured him. There was disagreement about his psychological diagnosis, but the video manifesto contained statements suggesting persecutory and grandiose delusions consistent with paranoid schizophrenia.

Several studies of juvenile homicide offenders support these three pathways to violence (Cornell, 1990; Cornell, Benedek, & Benedek, 1987; Greco & Cornell, 1992). The relatively low number of homicide offenders with psychotic disorders (Meloy, Hempel, Mohandie, Shiva, & Gray, 2001) makes it a difficult group to study, despite the high media profile of some specific cases. Many other studies contrast two groups, omitting the psychotic group. For example, multiple studies have supported a distinction between affective/reactive aggression and predatory/proactive aggression (e.g., Cornell et al., 1996; Dodge, Lochman, Harnish, Bates, & Pettit, 1997). This distinction is also frequently mentioned during the analysis of criminal offenders (Hanlon, Brook, Stratton, Jensen, & Rubin, 2013; Meloy, 2006). Although the distinction between reactive and proactive aggression is compelling, threat assessment teams should not assume that offenders engage in only one form of aggression. Both forms of aggression are present in the most severe violent offenders (Blais, Solodukhin, & Forth, 2014; Marsee, Frick, Barry, Kimonis, & Aucoin, 2014). Cornell and colleagues (1996) observed that psychopathy was associated with both instrumental and reactive violence, whereas nonpsychopathic offenders tended to commit reactive crimes.

Threat Assessment as a Form of Risk Assessment

There is debate about the distinction between threat assessment and risk assessment. Although the terms are sometimes used interchangeably, there is growing agreement that threat assessment is a specialized form of risk assessment that has important distinguishing characteristics (Meloy et al., 2014). Risk assessments are typically conducted for the purposes of making a decision about someone's release from institutional care (Monahan, 2010) or incarceration (Otto & Douglas, 2011). In many risk assessments, the anticipated act of violence may be unknown, there is no specific target or intended victim, and the timeframe for violence is open-ended. A risk assessment may be aimed at determining someone's generalized lifetime risk of violence, but threat assessment is concerned with whether someone will carry out a certain threatened act toward a particular victim in the near future. When the risk of violence is judged to be too high, a decision is made to continue the individual's confinement. The determination of a threshold or cut-off point for these decisions is not easily established and rests in part on value judgments about the degree of risk that is deemed tolerable.

Although threat assessments are more narrowly focused and situational than conventional risk assessments, this simple distinction generates a number of complications. Risk assessments tend to rely on instruments developed to predict violence whereas threat assessments place more emphasis on interventions to prevent violence. Because a conventional risk assessment has an open-ended, long-term time frame, there is less attention to situational factors and the individual's current mental state, plans, or intentions. Instead, risk assessments tend to rely on an actuarial approach based on scoring the presence or absence of static risk factors, such as the person's gender, previous violence, and criminal history. This approach has led to the development of quantitative risk assessment instruments such as the Violence Risk Appraisal Guide (VRAG; Quinsey, Harris, Rice, & Cormier, 2006).

Risk assessment instruments can be divided between those that rely on an actuarial formula to determine risk and those that encourage the clinician to make professional judgments that are guided by the instrument but also consider additional information not included in the list of risk factors (Reddy et al., 2001). The value of clinical judgment has been actively debated for more than 60 years (Meehl, 1954), with some authorities more recently recommending a synthesized view (Falzer, 2013; Monahan & Skeem, 2014). Examples of widely used structured clinical judgment instruments are the Historical, Clinical Risk management-20 (HCR-20; Douglas, Hart, Webster, & Belfrage, 2013) and the Structured Assessment of Violence Risk in Youth (SAVRY; Borum, Bartel, & Forth, 2006).

Because threat assessment is concerned with a specific and potentially imminent threat, there is much more emphasis on taking action to prevent

violence. In the immediate context of threat assessment, the individual's mental state and current behavior are central concerns. In many cases a potential victim can be identified and can be advised on actions to reduce risk rather than aggravate or provoke the aggressor. Much of the risk assessment literature is concerned with identifying a fixed set of predictors that can be measured in a sample of subjects, ignoring individual variation and idiosyncratic factors. This simplification is necessary for data collection and statistical analyses, but unrealistic for prevention purposes because it ignores potentially important information that is specific to the individual case and does not factor in the effects of interventions. For these reasons, professional judgment is considered an essential component of threat assessment (Borum et al., 2006). See Chapter 6 for more about predicting dangerousness.

Violence Prevention Versus Prediction

One common objection to threat assessment is that violence is too difficult to predict and therefore threat assessment is futile. This objection rests on the erroneous assumption that prevention requires prediction. Decades of research has found that professionals are only moderately successful in identifying individuals who subsequently commit serious acts of violence (Fazel, Singh, Doll, & Grann, 2012). However, the unpredictability of violence in individual cases does not mean violence cannot be prevented on a larger scale. There are obvious examples in the public health field of prevention programs that have saved lives from individually unpredictable causes (Mozaffarian, Hemenway, & Ludwig, 2013). For example, motor vehicle accidents occur unexpectedly and seem unpredictable, but there is ample evidence that traffic safety laws, driver training, and well-designed cars reduce the rate of accidents. Another example is the public health campaign to reduce tobacco smoking that has saved millions of lives. By identifying risk factors like smoking, prevention programs can have widespread effects without knowledge of which individuals have been saved. The American Psychological Association (2013) report on gun violence recommended a similar application of prevention principles to address violence.

Prevention is conceptualized as occurring on three levels (O'Connell, Boat, Warner, 2009). The first level is primary or universal prevention, which includes efforts to address the underlying environmental conditions and general factors that lead to the negative outcome, such as a disease, injury, or in this case, violence. Universal interventions are aimed at the general population. The secondary or selective level is aimed at individuals who are deemed to be at risk for the negative outcome, and the tertiary or indicated level is for those who already demonstrate the negative outcome and are in need of treatment to prevent recurrence or worsening.

Threat assessment can be regarded as a method of identifying the appropriate level of prevention needed for a specific individual. For example, an employee who threatens a coworker could need different interventions depending on the seriousness of their threat. If the threat was an overstatement made in a moment of frustration that ended in a retraction and apology, the appropriate intervention might be to remind the employee of the company policy regarding aggressive behavior. If the individual continued to feel angry or frustrated with this coworker, then conflict resolution or perhaps a reassignment of work responsibilities might be appropriate. Finally, if the threat assessment team identified the individual as someone with a history of violence who has continued to engage in threatening behavior and might pose a risk of violence, it would be important to engage law enforcement authorities and consider stronger actions to prevent a violent outcome. Some typical actions include mandating a period of mental health counseling, and if necessary, suspending the individual from employment.

True violence prevention efforts must begin well before there is a gunman in the parking lot. Violence prevention can begin at a primary level by helping families to raise healthy, well-adjusted children who are less prone to violence. Primary prevention can also be aimed at improving school and community services, so that all youth receive the benefits of good education, health care, and freedom from crime. Secondary prevention can ameliorate risk factors for violence that range from behavioral problems, bullying, and mental disorders, to social and economic disadvantages that are the seedbed for criminal violence.

Prevention of gun violence

Of special concern is the prevention of gun violence, which accounts for the majority of homicides and mass killings in the United States (Nekvasil, Cornell, & Huang, 2015). There is now substantial evidence supporting several key prevention strategies (Webster, 2015). One secondary prevention strategy that appears modestly successful is the restriction of firearm sales to high-risk individuals, such as individuals who are under a domestic violence protection order or those hospitalized because they are deemed to be a threat to themselves or others. Both strategies reduce firearm violence, even though such individuals could evade detection by purchasing a firearm from a private dealer or at a gun show (Webster & Wintemute, 2015). The limitation of this approach is that only a small proportion of gun violence can be attributed to persons under a domestic violence restraining order or hospitalized for mental illness. Moreover, federal laws that might prevent gun violence more successfully have legal loopholes and are weakly enforced, making them relatively ineffective (Webster & Wintemute, 2015).

One especially promising tertiary prevention strategy is the “special deterrence” approach developed as part of Boston’s highly successful Operation

Ceasefire (Braga & Weisburd, 2015). This program brought together law enforcement, social services, and a number of community groups to focus on a group of gangs that accounted for the majority of youth homicide in the city. Ironically, this strategy included explicit threats by law enforcement that gun violence would result in severe consequences, accompanied by outreach services offered by other agencies. This strategy seems to have worked in 9 of 10 cities where it has been tried (Braga & Weisburd, 2012).

Applications of Threat Assessment

Threat assessment is applied across a wide range of settings and circumstances, and contextual factors introduce variations in how the method is applied. A brief review of the different applications of threat assessment will elucidate some of the features that distinguish it from traditional risk assessment.

Threats aimed at public figures

The U.S. Secret Service made substantial contributions to the concept of threat assessment through its Exceptional Case Study Project, which examined 83 persons known to have attacked or planned to attack prominent public officials and celebrities (Fein & Vossekuil, 1998). The study provided three key conclusions. First was that there was no profile of “the assassin,” and that would-be assassins were best identified by behaviors indicating planning and preparation to carry out an attack. Second, most assassins were not motivated by serious mental illness, but were acting to bring attention to a problem or grievance. Third, direct threats against the intended victims did not increase the likelihood that the individual would make an attack, although the majority of individuals communicated their thoughts or plans to family members, friends, or other associates. The report noted that often the individual had experienced a major life disappointment, such as loss of a relationship or a financial setback that triggered feelings of shame and depression. The report recommended that a threat assessment should include a detailed interview with the individual and development of a management plan to monitor and redirect the individual.

Threats against government officials are extraordinarily common and have resulted in numerous attacks worldwide. A high proportion of attacks are committed by persons with mental illness who may have delusional ideas about their target (Hoffmann, Meloy, & Sheridan, 2014). Perhaps the most famous and influential case in mental health law involved a woodturner who believed that the Tory party was persecuting him and in 1843 he attempted to assassinate the British prime minister and mistakenly killed his secretary Edward Drummond (Dalby, 2006). Many individuals testified at his trial that they knew of the perpetrator’s hostility toward the government and his irrational conviction that the

government was somehow injuring him. The perpetrator's acquittal as not guilty by reason of insanity led to the development of legal standards for insanity widely used in England and the United States (Packer, 2009).

A more contemporary case is that of a man who, in 2011, attempted to assassinate Arizona Congresswoman Gabrielle Giffords and in the process shot 19 persons, killing six. The shooter was diagnosed with paranoid schizophrenia (Serrano, 2011). This case in particular reflects the need for community-based threat assessment teams that could be a resource for family members and friends to seek help. According to an Anti-Defamation League (2012) report, the shooter's online writings and videos expressed numerous paranoid ideas about the government, such as the belief that the government was brain-washing people by "controlling grammar." Many of his writings were disjointed and illogical. According to police records, his parents had been highly concerned about his angry and irrational behavior (Orr, 2013). His father had confiscated the shooter's shotgun and repeatedly disabled his car to prevent him from leaving the house.

Although mental illness is linked to violence in some high-profile cases, systematic examination of a wider sample of cases reveals other patterns. Many individuals who threaten government officials or the public at large are motivated by political or ideological beliefs (Fein & Vossekuil, 1997, 1999). The 2013 Boston Marathon bombing that killed three people and injured approximately 264 others is an example (Majority Staff of the Committee on Homeland Security, 2014). In this case, two Chechen brothers were motivated by extremist Islamic beliefs to carry out a mass attack on U.S. citizens. Currently, there is intensive research on identifying individuals whose political or ideological beliefs would motivate them to commit mass murder; Meloy and Mohandie (2014, p. 388) described these individuals as "violent true believers."

Workplace threats

Violence in the workplace is another arena for threat assessment. For example, threat assessments may be conducted when an employee with a grievance has threatened a coworker or supervisor. When the threat involves an employee, the threat assessment team has leverage to work with the individual to resolve the threat. In such cases, the threat assessment team not only evaluates the risk of violence, it also looks for ways to respond to the employee's concerns and, if possible, resolve them (Calhoun & Weston, 2009; Miller, 1999; Nicoletti & Spooner, 1996). The team may work in collaboration with the employee's supervisors and might advise them to refrain from actions that would aggravate the situation, such as taking punitive action against the employee, and encourage interactions that might de-escalate the situation and facilitate reconciliation.

There is no more effective way to prevent a threatened act of violence than to address the source of the frustration and anger underlying the threat. This is a good example of how threat assessment has evolved from a focus on prediction of violence in more traditional forms of risk assessment to an emphasis on prevention of violence.

Stalking

In cases that take place outside of an institutional setting, the threat assessment team has more limited opportunities for intervention. Stalking presents an especially difficult challenge for threat assessment. The threat assessment team may have little access to the threatening individual and may lack the leverage to engage them in an assessment if the stalking behavior is not taking place in the context of a workplace or school. The motives for stalking also may make it difficult to resolve the individual's conflict or problem. In cases of intimate partner violence, the person may refuse to accept that a former partner no longer wants to be in a relationship. In these cases, much of the threat assessment is focused on assessing the individual's risk of violence and there are a variety of specialized risk assessment instruments to assist the team (Kropp & Cook, 2014).

A report by the National Center for Victims of Crime (2002) provides specific guidance on threat assessment in stalking cases. The guidelines encourage gathering as much information as possible about the victim and the suspect. For example, the guidelines recommend evaluating whether the stalker has a military background, uses others to monitor the victim, and has contacted or threatened the victim's family or friends. The team should also inquire about the victim's degree of fear and apprehension and whether they have obtained a restraining order against the stalker (National Center for Victims of Crime, 2002).

Threat assessment in schools

After the 1999 shooting at Columbine High School in Colorado, reports by the FBI (O'Toole, 2000) and U.S. Secret Service and Department of Education (Fein et al., 2002) recommended that schools adopt a threat assessment approach to violence prevention. Although most school authorities and educators were unfamiliar with threat assessment at the time, it has become widely recognized as a valuable school practice (Cornell, 2014, 2015). In schools, a threat assessment is most often concerned with understanding why a student (or someone else associated with the school) made a threat or engaged in threatening behavior. A school-based threat assessment team gathers information and then develops appropriate interventions that address the underlying problem or concern that motivated the threat.

The key dilemma in school-based threat assessment is to avoid overreacting to the common day-to-day threats that are not serious while not underreacting to more serious threats. School-age children and youth engage in a great deal of verbal aggression, and may make threats simply as an expression of anger or frustration. A survey of 4,400 high school students found that approximately 12% reported being threatened with harm by another student in the past 30 days (Nekvasil & Cornell, 2012). Nearly three quarters did not believe the threat was serious and only about one quarter reported the threat to school authorities. Similarly, acts of physical aggression, harassment, and bullying are much more common in schools than in the adult workplace. According to the Youth Risk Behavior Survey, 20% of female and 18% of male high school students nationwide reported being bullied at school in the past 12 months (Centers for Disease Control and Prevention, 2014). Sixteen percent of boys and 8% of girls in grades 9–12 reported being in a physical fight at school during the previous 12 months (Robers, Kemp, & Truman, 2013).

Serious acts of violence are rare in schools. According to the National Crime Victimization Survey, the annual rate of serious violent crime (i.e., robbery, forcible rape, aggravated assault) is approximately 3.5 incidents per 1,000 students (Robers et al., 2013). The media attention given to school homicides suggests there is an epidemic, but in fact the rate is extraordinarily low. In the 10-year period from 2001 to 2011, there were 200 homicides of school-age children in U.S. schools, an average of about 20 per year (Robers et al., 2013). Although 20 homicides is a tragic and unacceptable amount, it means that in the nation's 120,000 schools, the average school will have a student homicide every 6,000 years ($120,000 \div 20$).

A comparison of homicides across locations is important information for a threat assessment team, because there may be a tendency to overestimate the risk of a student committing a shooting at school (Cornell, 2006). A study using the FBI's National Incident-Based Reporting System (NIBRS) examined the prevalence of homicides, including mass shootings, across 37 states over a 6-year period (Nekvasil et al., 2015). The most common locations for homicides were residences, which accounted for approximately half of all incidents, regardless of the number of victims. Even homicide incidents with six or more victims occurred much more frequently in residences (48.9%) than roads (14.4%), parking lots (10.0%), or restaurants (11.1%), which were the next most common locations. Schools (K-12 schools, colleges, and universities were grouped together) accounted for just 1.1% of the homicide incidents with six or more victims, and less than 1% of the incidents with fewer victims. Schools and religious institutions were the safest locations identified in the study.

Many school authorities have devised threat assessment systems for their school or adapted systems from the literature (e.g., O'Toole, 2000; Van Dreal, 2011; Van Dyke & Schroeder, 2006; Vossekuil et al., 2002). The Virginia Student Threat Assessment Guidelines (Cornell & Sheras, 2006) was developed in 2002

based on reports from the FBI (O'Toole, 2000) and Secret Service and U.S. Department of Education (Vossekuil et al., 2002), as well as research conducted in Virginia public schools. The Virginia threat assessment model is described in a 145-page manual (Cornell & Sheras, 2006) and presents a seven-step decision tree to guide school-based teams through a process of evaluating the threat, quickly resolving transient threats that are deemed not serious, and focusing more resources on substantive (i.e., serious) threats. A typical threat assessment team consists of a school administrator (e.g., principal or assistant principal), counselor, psychologist, social worker, and resource officer (e.g., law enforcement officer).

There is considerable research supporting the Virginia threat assessment model. Two field tests demonstrated that school-based teams could carry out threat assessments in a practical, efficient manner without violent outcomes (Cornell et al., 2004; Strong & Cornell, 2008). Almost all students were returned to school and few received long-term suspensions or transfers to another school. Another study found that staff training in threat assessment lowered concern about school shootings and decreased support for zero-tolerance discipline (Allen, Cornell, Lorek, & Sheras, 2008). Two quasi-experimental controlled studies found that schools using the Virginia Guidelines experienced lower suspension rates and less bullying, and their students reported greater willingness to seek help for threats of violence (Cornell, Gregory, & Fan, 2011; Cornell, Sheras, Gregory, & Fan, 2009). A randomized control study of 40 schools found that students who made threats of violence in schools using the Virginia Guidelines were much more likely to receive counseling services and less likely to be suspended or transferred to a different school than in the control schools (Cornell, Allen, & Fan, 2012). In 2013, the Virginia Student Threat Assessment Guidelines was recognized as an evidence-based practice in the National Registry of Evidence-Based Programs and Practices (NREPP; 2013).

A statewide examination found that secondary schools using the Virginia Guidelines recorded fewer school suspensions than other schools, controlling for school size, the percentage of low income students, and the percentage of minority students (JustChildren & Cornell, 2013). A promising finding was that suspension rates were lower for both white and black students in schools using the Virginia Guidelines, and the lower rate for black students substantially reduced the racial disparity in long-term suspensions. In 2013, Virginia legislation mandated that all its public schools establish threat assessment teams; a statewide evaluation of this system is under way (Cornell et al., 2015).

Conclusions

In conclusion, threat assessment represents an evolutionary step forward in the practice of violence risk assessment. Unlike conventional risk assessment that typically measures static risk factors to predict the long-term risk of violence

with no specific target, a threat assessment is concerned with an immediate threat of violence towards an identified target. Consequently, threat assessment places greater emphasis on situational and dynamic risk factors, and uses them to develop a prevention plan. Threat assessment has been applied to specialized problems, such as the protection of public figures, acts of terrorism, and domestic violence. Threat assessment teams have been established in institutional settings, such as businesses and schools, but can also be used at a community level. Analyses of mass murder cases reveal many opportunities where a threat assessment approach might have been effective. However, much more research is needed to develop threat assessment practices and validate their effectiveness as violence prevention strategies.

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Ethical Conduct of Research in the Aftermath of Mass Shootings

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Mass shootings are complex and confusing situations that pose many methodological challenges for researchers who aim to promote knowledge that may help future impacted communities. Advancing scholarship about mass shootings requires multidisciplinary knowledge and a commitment to ethical decision-making. While the knowledge base is growing, the literature on ethical decision-making while conducting such research is limited. In fact, only one study has investigated individuals' reactions to participating in a study following a mass shooting (Fergus, Rabenhorst, Orcutt, & Valentiner, 2011). Given this lack of specific information on the ethical conduct of research about mass shootings, this chapter will primarily draw on information from the literature on the ethics of human subjects research related to trauma as a whole.

There is no consensus on how to define “mass shooting” among researchers (Shultz et. al., 2014). For the purposes of this chapter, we will define mass shooting as a mass murder conducted with a firearm. According to the Federal Bureau of Investigation, a mass murder is an incident in which four or more people are killed in a single incident, with no distinctive temporal separation between the murders (Morton & Hiltz, 2008). The discerning characteristic that defines this “mass” event is the qualification that the murders occurred during a single time period. This stipulation qualitatively differentiates “mass” events from “spree” or “serial” events, which require a distinctive “cool down” period between the murders. This definition is not perfect, particularly in its distinction between “mass” and “spree” shootings (see Chapters 1–3 for more information on the definition of mass shooting), but for the purposes of exploring issues related to ethical research this definition should suffice as it focuses on interpersonal violence that involves multiple victims. Given this

definition, this review relies on evidence and scholarship about ethical research practice in the aftermath of mass disasters, terrorism, and interpersonal violence. While many of these events share similarities (e.g., multiple victims, bystanders, impact on family members, the need for coordinated responses, coverage in the news), mass shootings may be distinct in numerous ways. For example, naturally caused mass disasters lack the interpersonal element of mass shootings. Also, while terrorism is designed to intentionally elicit fear, panic, and behavior change in the public (Terrorism, 2012), such reactions may be a byproduct of mass shootings, but are not necessarily the key causal motivation. Yet, despite critical differences among these traumatic events, the overall similarities can serve as a basis to describe ethical issues in the conduct of research on mass shootings. Moreover, a recent meta-analysis of responses to trauma-focused research participation found no differences between participants who had experienced either sexual or nonsexual trauma (Jaffe, DiLillo, Hoffman, Haikalis, & Dykstra, 2015), which further justifies our ability to rely on the general scholarship related to ethical research practice in the field of trauma.

This review is predicated on the assumption that researchers who study mass shootings are well-intentioned practitioners who seek to answer essential questions in ways that are methodologically and ethically sound. With respect to ethical research practice, researchers and regulatory bodies must consider and weigh the ethical principles of autonomy/respect for persons, beneficence and nonmaleficence, and justice (National Commission for the Protection of Human Subjects of Behavioral Research [National Commission], 1979). Broadly speaking, respect for persons involves regard for the autonomy and capabilities of individuals to make informed decisions about research participation. In addition, it involves protecting those with diminished autonomy while still allowing them the freedom to enact choices within their capabilities. Beneficence aims to maximize the potential benefits and minimize the potential harms of research participation. Potential harm is evaluated by examining the probability of costs, such as inconvenience and discomfort, as well as the probability of long-lasting psychological or physical harm. Justice requires equitable selection of participants such that those who undertake the burden of research should be those who are likely to benefit. Thus, the foundational principles of autonomy, beneficence, and justice guide ethical decision-making during the process of conducting research.

Although ethical decision-makers are advised to balance these principles equally, it is difficult to operationalize each principle and equally weigh each concern. Further, given the complexities, these judgments are susceptible to human decision-making errors (Newman & Kaloupek, 2004). These errors may be heightened due to the intense reactions (e.g., anger, fear, disgust, grief, blame, curiosity) and various community and policy concerns (e.g., safety, gun violence, mental health, corrections practice, social class, poverty) that are evoked by mass shootings. In light of these issues, special care needs to be

taken when interacting with those most proximal to the event (e.g., survivors and their families, bystanders, community members, perpetrators). The present chapter reviews the evidence base to offer recommendations on how to conduct ethically informed research. Most psychological research on mass shootings to date has involved noninvasive procedures – interviews, surveys, and physiological measures (e.g., cortisol, skin conductance) – where the risks were relatively low. Nevertheless, it is necessary to ensure that research promotes autonomy, is associated with a favorable benefit-cost ratio, and in some way benefits those who participate.

Overview of General Issues for Victims and Impacted Communities

The present chapter will examine ethical issues that are pertinent to research in the aftermath of mass shootings and relevant findings from research on trauma-affected populations. First, the issues of autonomy and respect will be discussed. Second, attention will be paid to the vulnerability, decisional capacity, and consent/assent of potential participants. Third, beneficence and nonmaleficence will be explored in terms of the benefits, risks, and confidentiality of potential participants. Fourth, the issue of justice will be discussed in the context of the burden that potential participants may carry, as well as the dissemination of the results of the study. Lastly, broader, overarching concerns will be examined.

Autonomy/respect for persons

Autonomy and respect as fundamental principles of research require that each person be given the respect, time, information, and opportunity to make independent decisions about their own research participation, within the limits of their own capabilities (National Commission, 1979). In the aftermath of mass shootings, it is vital to assure that the autonomy of survivors, bystanders, and the greater community is not violated. Mass shootings often generate fear, anger, confusion, and uncertainty among those directly and indirectly impacted by the events, which could increase the vulnerability of potential participants or exacerbate coercion. The vulnerability of research participants generally refers to a susceptibility to be misled, mistreated, or exploited by researchers (Levine, 2004; National Commission, 1979). Although vulnerability is not explicitly defined in federal regulations, the regulations do require extra protection of those considered vulnerable. Researchers must be mindful that survivors may be physically and/or psychologically injured, which may compromise their decision-making abilities. Mass shootings can violate the sense of self-efficacy and independence of those impacted by the events. Thus, research needs to be

conducted in a way as to not take advantage of the victims feeling powerless and to not further foster any feelings of a lack of control.

With regard to autonomy, the major focus of ethical decision-making revolves around the potential participants' decisional capacity to consent to research. The consensus within the psychological literature is that decisional capacity is not impaired in survivors as a result of exposure to trauma, including those who subsequently develop posttraumatic stress disorder (PTSD). However, it should be noted that many individuals impacted by mass shootings may have other conditions or disorders that affect their ability to consent (e.g., severe head injury, acute psychosis). However, this body of literature is extremely flawed, since few published studies about decisional capacity among trauma survivors indicate if and how many participants were excluded due to concerns about conditions that would affect their ability to give consent, such as extremely low intelligence, psychosis, and/or head injury (Collogan, Tuma, Dolan-Sewell, Borja, & Fleischman, 2004). Clearly trauma survivors and those with PTSD do require care and attention, but as a class they do not appear to meet the definition of vulnerable groups in terms of decisional capacity (Collogan, Tuma, Dolan-Sewell, et. al., 2004; Newman & Kaloupek, 2004, 2009). Nevertheless, as with all research endeavors, specific individuals in the sample may have deficits that should be evaluated and considered using best practice guidance and tools (Appelbaum & Grisso, 2001).

Previous research has demonstrated that across several trauma-focused studies, most participants have indicated that they were treated with respect while participating in their respective research studies (e.g., Kassam-Adams & Newman, 2002; Newman, Willard, Sinclair, & Kaloupek, 2001; Widom & Czaja, 2005). In addition, available studies suggest that most adult and child participants in trauma-focused research indicate that they felt able to refuse to participate, to stop or skip questions, and to tell research staff when they did not like aspects of the research protocol (e.g., Hebenstreit & DePrince, 2012; Hurley & Underwood, 2002; Kassam-Adams & Newman, 2002, 2005; Ruzek & Zatzick, 2000). A minority, however, indicated that they did not feel able to refuse to participate initially (e.g., Ruzek & Zatzick, 2000). To counteract any coercive pressure a potential participant may experience due to feeling powerless or having a desire to help, it is important to stress the voluntary nature of the study to all participants in the aftermath of a mass shooting. It may also be useful to remind participants of the voluntary nature of the study throughout data collection. However, there is no empirical evidence as to whether this is effective in reducing any perceived coercion (Fontes, 2004).

With regards to survivors of mass disasters, another means of potential coercion relates to the issue of research versus clinical services because many survivors may mistakenly believe they are receiving therapeutic assistance when interacting with research personnel. It is imperative in the aftermath of mass disasters that participants understand that they are being approached for

research and not clinical services (Collogan, Tuma, & Fleischman, 2004; Fleischman & Wood, 2002; Qureshi et. al., 2007). While there are no data to inform us on how often this misconception occurs with respect to mass shootings, particularly in research without an intervention component, practice recommendations include urging survivors to consult with family members prior to research participation and clearly stating the research question in the informed consent procedures (Collogan, Tuma, & Fleischman, 2004; Fleischman & Wood, 2002; Qureshi et. al., 2007). In the future, more studies need to assess the degree to which this is a problem in the aftermath of disasters, and specifically mass shootings.

Given that many mass shootings, especially school shootings, involve children, assent is a critical concern for researchers. Children cannot give legal consent, but the recommended practice is that all children be given an opportunity to assent to participate, to whatever degree is possible given their developmental age (Institute of Medicine, 2004). Fortunately, for researchers who present information in a developmentally appropriate way, the majority of children seem capable of understanding the voluntary nature of participation, as noted in pediatric traffic injury studies (e.g., Kassam-Adams & Newman, 2002, 2005). With respect to fully understanding the actual research aims and procedures, a small body of literature provides mixed evidence. A study conducted on peer provocation suggests that children 8 years of age and under may have difficulty understanding concepts of confidentiality and research tasks. In addition, children up to age 12 may struggle with understanding the aim of the research studies (Hurley & Underwood, 2002). On the other hand, a study of injured children found that 87% appraised the explanation of the study as accurate and 76% believed the study was confidential (Kassam-Adams & Newman, 2005). Thus, the evidence suggests that most children and adolescents who experience a mass shooting are able to make choices about whether to engage in research, when it is presented in a clear and developmentally appropriate fashion. However, they may not be able to comprehend all details of the studies. Overall, trauma-related studies show that participants tend to perceive that they were treated with respect, and self-report responses by both children and adults reveal that they are generally satisfied with the information and procedures involved in informed consent (Chu, DePrince, & Weinzierl, 2008; DePrince & Chu, 2008; Kassam-Adams & Newman, 2005; Newman et. al., 2001; Ruzek & Zatzick, 2000). Nevertheless, more empirical evidence is needed and ways to enhance participant comprehension of study designs, particularly child participants, should be pursued.

Finally, the issues involved in assuring autonomy for participants in research focused on perpetrators of mass shootings are complex. Opportunities for research with perpetrators of mass shootings are rare, largely due to the majority of perpetrators committing suicide or being killed by police during the event (Blair & Schweit, 2014). However, if the opportunity for research

with apprehended perpetrators presents itself, there are a number of important factors to consider. Informed consent in criminal justice research is unique both before the trial and after prosecution. Prior to the trial, researchers studying perpetrators must be well-versed in the laws and reporting requirements (e.g., mandatory reporting requirements regarding abuse or future crimes) related to such work and must carefully communicate those as part of the consent process. For example, researchers need to be aware of and communicate to participants that the researchers themselves may be legally compelled to disclose information they gather from the perpetrator(s), should study information be relevant to the case (Jones, 2012; Lowman & Palys, 2001). Communication of this information is essential in informed consent procedures with perpetrators so that they are able to make an informed decision about participation.

As in the case of studying perpetrators of sexual violence, research of mass violence should not be used for the investigation of criminal cases (Jewkes, Dartnall, & Sikweyiya, 2012). Given that it is very difficult to assure that information shared during research will not be accessed for prosecution, research is not typically conducted at this time. However, if research is conducted, research teams need to be careful to avoid incriminating disclosure (Jewkes et. al., 2012). For instance, the methodology used may create circumstances in which perpetrators reveal information that incriminates them or implies their involvement in crimes. In this case, researchers should warn participants against providing too much detail, as well as the potential legal consequences of such disclosures should the researchers be subpoenaed (Jewkes et. al., 2012). After the trial and conviction, concerns about whether the person is able to volunteer to participate must be carefully considered. In addition to all the protection measures used for prisoners, as defined by Subpart C of the Code of Federal Regulations for the protection of human subjects (Department of Health and Human Services, 2009), consent must clarify that research participation will not affect the ways in which correctional authorities perceive the participants.

In conclusion, there is no evidence to suggest that persons who experience traumatic events or who suffer from PTSD as a result have deficits in their capacity to consent, although this has not been established specific to mass shootings. Most experts agree that it seems unlikely that decision-making capacity is impaired among survivors and witnesses of mass shootings. However, the base rates of exclusion for deficits related to decision-making capacity are seldom reported in trauma studies, so there is no systematic way to assess this issue. Similarly, the current evidence suggests that survivors and those with PTSD are not more susceptible to coercion or inability to appreciate the content of the consent process than other participants. Thus, evidence indicates that it is ill-advised to apply the broad category of vulnerability to trauma survivors or individuals with PTSD. Clearly trauma survivors and those with

PTSD do require care and attention, but as a class they do not appear to meet the definition of vulnerable groups (Collogan, Tuma, Dolan-Sewel, et. al., 2004). Nevertheless, those who study the psychological effects of mass trauma should strive to emphasize that the participants have the choice to participate or not, and provide clear explanations of the research questions and methods used throughout the recruitment and consent processes. Those who study mass shootings could contribute to the field by proactively collecting data about the efficacy of their recruitment and consent procedures. Furthermore, those who study perpetrators need to focus on assuring that consent is freely given and abide by all the special precautions and recommendations for obtaining consent from prisoners.

Beneficence and nonmaleficence

Research in general, and specifically in relation to mass shootings, can involve many potential benefits (e.g., empowerment, altruism, insight, feeling of satisfaction or value after participating), costs (e.g., inconvenience, boredom, time, minimal distress), and risks (e.g., injury, psychological discomfort, unwanted media attention; Newman & Kaloupek, 2004). Careful consideration of each of these potential benefits, costs, and risks can inform research designs and decisions to assure that the value of systematically gathering information does not exceed its costs.

Minimal risk Much of the research literature has focused on the concept of trauma-related distress and whether it exceeds minimal risk. Minimal risk is when “the probability and magnitude of harm or discomfort anticipated in the research are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests” (Department of Health and Human Services, 2009, p. 4). Most trauma researchers argue that the risk experienced during typical survey and interview studies about mental health after traumatic events satisfies the definition of minimal risk because any distress ensued by thinking about the events is no greater than distress encountered as a result of other daily reminders (e.g., news, reminders of loss; Becker-Blease & Freyd, 2006). Given the extensive news coverage of most mass shootings and the aftermath, most mental health surveys and interviews about the impact of the event are highly unlikely to exceed minimal risk, since the distress encountered should be no greater than that generated in daily life.

One study has focused on mass shootings in particular. In a study of 58 college students who were on a campus where a school shooting occurred, but not in the classroom where the event took place, participants wrote and read a narrative about their reactions to the shooting 6 weeks after the event. Using both objective (i.e., cortisol, heart rate, skin conductance) and subjective

(i.e., self-report) measures, the authors assessed both subjective and objective distress. While those with PTSD symptoms had more subjective distress, but not objective distress, than those without symptoms, 85% indicated they would participate again if asked. No information was provided about the 15% who would not participate again. Thus, it appears that the majority of bystanders and witnesses experience tolerable distress when asked to think about their experiences during a mass shooting. This is consistent with existing research from other studies, which suggests that a small portion of participants experience some distress (e.g., McClinton Appollis, Lund, de Vries, & Mathews, 2015), both expected and unexpected, during trauma-related research. However, research studies indicate that this distress is not perceived as beyond minimal risk, it is manageable, it is not the same as regretting participating, and most respondents perceive the benefits as worth the emotional costs (Carter-Visscher, Naugle, Bell, & Suvak, 2008; Hebenstreit & DePrince, 2012; Jaffe et al., 2015; McClinton et al., 2015; Verschuur, Spinhoven, van Emmerik, & Rosendaal, 2008). Some argue that the expression of mildly negative, but tolerable affect during research may represent the participants' emotional engagement in the research project rather than being an indicator of harm (Collogan, Tuma, Dolan-Sewell, et al., 2004; Dyregrov, Dyregrov, & Raundalen, 2000; Newman & Kaloupek, 2004). Nonetheless, as many as 24% of participants perceive their participation as more upsetting than they anticipated (Carlson et al., 2003; Newman, Walker, & Gefland, 1999; Ruzek & Zatzick, 2000; Ybarra, Langhinrichsen-Rohling, Friend, & Diener-West, 2009). Therefore, the potential for harm needs to be communicated to participants and mitigated whenever possible. While distress may be minimal, it is prudent to create protocols in which the provision of mental health support is always available should a participant experience intense distress.

Confidentiality as a risk Given that mass shootings result in a finite number of potential participants among the identifiable victims, direct witnesses, and perpetrator(s), threats to confidentiality of potential participants is particularly pronounced. Participants may be readily identified given the extensive public information available about many of those directly affected. Even if presented as group data, sharing certain information about mental health, social functioning, and social and economic class may place participants' confidentiality at risk. Researchers need to consider these factors ahead of time to develop a means of presenting the relevant information but also ensuring they protect the identities of the participants. In some cases, it may be wise to postpone the dissemination of results until information is amassed across a number of mass shootings so that research participants cannot be as easily identified.

In addition, researchers examining mass shooting may need to account for potential threats to confidentiality if criminal or civil proceedings are in process. In addition to presenting a potential obstacle to successful research recruitment,

such legal proceedings might pose issues related to safeguarding confidentiality. Immediately de-identifying data and recording certain demographic information in separate files from sensitive information are all possible strategies to consider. The pursuit of a Certificate of Confidentiality might also be prudent, which will allow researchers to refuse to disclose identifying and sensitive information obtained in research to legal teams. However, there are two exceptions to the protection a Certificate of Confidentiality provides, the former of which is most relevant to mass shooting studies. Research teams would be required to comply with requests from the United States Government for the purpose of auditing or evaluating federally funded projects and with requests for information to ensure compliance with regulations of the Federal Food and Drug Administration (FDA; Check, Wolf, Dame, & Beskow, 2014). Overall, researchers should be judicious and employ all necessary measures to protect and ensure the confidentiality of potential participants whenever possible.

Justice

With respect to research, the principle of justice typically focuses on distributive justice, in that there is a fair allocation of the potential benefits and burdens of research so that no one group or class of participants bears disproportionate benefits or risks from the research (National Commission, 1979). Thus, the population from which research participants are recruited should match the groups that benefit from the potential results of the study. When applied to mass shooting research, the general justice issues focus on assuring that (1) the needs of mass shooting stakeholders are represented in research and (2) the research generated on mass shooting survivors benefits the needs of this group so they are not bearing the costs without the benefits. An additional aspect of justice could include procedural justice, the degree to which stakeholders influence the research agenda, and the questions and resources allocated to generating knowledge about the conditions affecting them.

Research burden One of the challenges of conducting research on mass shootings and survivors of particular disasters relates to the finite number of directly affected individuals. After a mass shooting, there can be an influx of researchers, journalists, and other interested parties vying for access to the individuals and communities directly impacted by these events. Multiple researchers may attempt to access the same individuals, thus posing a burden to those coping with the aftermath of shootings. Moreover, there is potential that different teams may be studying the same research question, further amplifying research burden. While it is difficult to balance the need to protect the participants and the freedom of scholarship, strategies can be implemented that prioritize reducing research burden for potential participants. These strategies include coordination among different research teams and data sharing (Collogan, Tuma, & Fleischman,

2004). Furthermore, collaboration among Institutional Review Boards and/or the use of a centralized Institutional Review Board allows for greater oversight, monitoring, and gatekeeping related to research burden and can result in preventing research teams from duplicating studies (Collogan, Tuma, & Fleischman, 2004). Appropriate guidelines should be developed to make coordinated research and data sharing possible. In the case of certain episodes of terrorism, the director of the Office of Human Research Protections has issued a mandate to require that provisional review and approval of protocols use a centralized review panel consisting of local stakeholders and experts (Fleischman & Wood, 2002). However, the potential success of such approaches is uncertain. Following the 1995 Oklahoma City bombing, the Governor designated the University of Oklahoma Health Sciences Center (OUHSC) as the lead institution overseeing bombing-related research. The OUHSC Institutional Review Board organized to assist colleagues at other institutions, provide local oversight, serve as a research clearinghouse, and offer full expedited review to bombing-related studies. Of particular concern was the protection of participants and their referral to services if necessary (North, Pfefferbaum, & Tucker, 2002; Quick, 1998). No such mechanism was established in New York City following the September 11 attacks, which was a more catastrophic event in a much more complicated environment (Fleischman & Wood, 2002).

Dissemination The goal of the respective research study should inform the dissemination of the subsequent findings. If the goal of the research on mass shootings is to prevent these events from occurring in the future, then dissemination efforts should be undertaken to deliver study results back into the broader community (e.g., through television, Internet, news) to inform future prevention efforts. If the goal is to better inform or rehabilitate affected communities, researchers should disseminate findings through community resources (e.g., relaying information to community organizations, conducting presentations for community members). Lastly, if the goal of the research is to understand the impact on mental health, efforts should be undertaken to deliver study results to the mental health professionals who serve affected or involved communities (Fontes, 2004). Ultimately, the principle of justice prescribes that research on mass shootings should not only benefit the scientific community but also those who undertake the burden of this research. Thus, findings should be disseminated in a manner that benefits stakeholders.

Overarching Concerns

Especially in the context of mass shootings, the potential impact of the research question should be weighed in regard to how it will affect the community. In defining research goals for studies including disaster survivors,

it has been suggested that the potential results should serve to promote the field for the greater good (Ferreira, Buttell, & Ferreira, 2015). This would conceptually combine both principles of beneficence and justice. As such, the purpose of the research needs to both advance science and have the potential to serve the currently affected community and future affected communities. Research on mass shootings should utilize the best methodology, integrate the most up-to-date theory and science, and promote new knowledge. While replication studies are essential for confirming or disconfirming the validity and generalizability of previous research findings, replication could needlessly repeat the same studies with the same samples at the potential expense of increasing participant burden (Cromer & Newman, 2011). For example, there comes a point at which some facts are evident from accumulated studies, such as there being a high likelihood that a percentage of mass shooting survivors will struggle with symptoms of anxiety, PTSD, and depression. Without the burden of unnecessarily replicating these findings, studies that address more sophisticated questions about mediators and moderators, course, and severity might take precedence. Additionally, the research team might anticipate ahead of time if the research question itself poses any potential harm to the community stakeholders should criminal proceedings emerge. Thus, the utility and context of the specific research question should be carefully considered.

Clearly there are many areas for potential future advancement. Given the lack of consensus about how mass shootings are defined (Shultz et. al., 2014), researchers need to characterize their findings in light of a specific definition, so that the research base can accrue in ways that acknowledge differences across studies and eventually a clear shared definition will be identified. Without this clarity, clear conclusions cannot be drawn. Much of the extant research has focused on individuals in the affected communities but community-level impact studies to understand the overall effect appear to be warranted (Muschert, 2007; see Chapter 12 for more on community-level difficulties). Schultz and colleagues (2014) have noted a lack of systematic examination of the psychological impact upon first responders including hospital-based personnel (see Chapter 13 for more on the mental health consequences in first responders). In addition, only a few studies exist focusing on the impact upon journalists covering these events (Backholm & Idås, 2015; see Chapter 14 for more on the psychological impact on journalists). Thus, there are many affected groups (e.g., funeral personnel, medical examiners) that require further attention. Additionally, more interdisciplinary research that integrates psychological, criminal, sociological, communication, and civic perspectives may advance our understanding of individual and community effects. Prevention, harm reduction, and intervention are important areas for research focus, both in terms of disaster behavioral health (Schultz et. al., 2014) and crime prevention.

Recently, survivors of nine different mass shootings issued a press release urging media to not name the shooter or promote their image (No Notoriety, 2015). This campaign notes that news reports may unintentionally foster mass murder given that certain types of mass killers are motivated by the desire for notoriety or fame. The degree to which a change in news practice is followed and effective in prevention is worthy of study (see Chapters 7–10 for more on the role of journalism in the aftermath of mass shootings). Moreover, the degree to which scholars should follow the same guidelines and make a deliberate effort to not contribute to the notoriety of individual perpetrators is an interesting and important question. Postponing the dissemination of results until enough information is gathered that the perpetrators involved in the research cannot be readily identified may mitigate this issue. In addition, as previously mentioned, the scope of dissemination should match the goal of the research.

Lastly, the responsibility of researchers to contextualize and comment on controversial social policy recommendations in light of research findings is an intriguing area of ethical practice. Mass shootings are highly publicized events that raise many societal concerns, especially around public safety, gun legislation, mental health policy, and criminal reform (see Chapter 4 for more on issues related to the development of mass shooters). For example, one of the debates that has ensued is the degree to which research on mass shootings should impact gun ownership policies. On the one hand, mass shootings represent a minority of firearm homicides (Schulz et. al., 2014), but on the other hand, they receive the most societal attention with respect to gun control issues. To what degree should researchers who study mass shootings raise this concern without trivializing the pain and importance associated with such events? Similarly, to what degree do researchers have a moral responsibility to weigh in on issues about firearm access and other evidence-informed policy recommendations about those who are dangerous or mentally ill (e.g., McGinty, et. al., 2014; Rosenberg, 2014)? These issues are extremely important and it is vital that researchers take an evidence-based approach to commenting on policy that accounts for the strengths and weaknesses of the existing evidence base.

Conclusions

Weisburd (2003) argues there is a moral imperative to conduct randomized trials in evaluating crime and justice interventions. We extend this argument and conclude that there is a moral imperative to use ethically sound methodology to answer all questions pertaining to mass shootings. From the existing evidence on other forms of violence and disasters, research can be conducted safely and ethically with participants affected by mass shootings, if carefully

implemented. Further, there is an imperative for scholarship to move beyond simply replicating accepted knowledge to transform our ability to prevent mass shootings, mitigate the ill-effects among affected individuals, and promote effective community response.

Mass shootings are devastating events that can have far-reaching social and psychological consequences. In the face of conducting research after one of these events, researchers need to take appropriate steps to ensure they are acting ethically. Though there is only one study that has directly examined research practice after a mass shooting incident (Fergus et. al., 2011), the broader literature that has examined ethical research following trauma tells us that issues related to autonomy and respect, beneficence and nonmaleficence, and justice are of particular importance. Further, researchers have an ethical obligation to pursue understudied areas and use evidence accurately to help policy makers and citizens determine sensible policies related to controversial issues raised by mass shootings.

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Future Directions

Danny Axsom

Rarely is the timeliness of a book so evident as in the case of mass shootings. In the latter half of 2015 alone, mass shootings occurred with a disturbing and numbing regularity – Charleston, South Carolina; Roseburg, Oregon; Paris; Colorado Springs, Colorado; San Bernadino, California. Considering just the United States, 26 mass shooting murders (four or more killed in a single incident, not including the shooter) were documented between January 23 and December 13 of 2015. If we define mass shootings more broadly to include four or more either killed or injured, 317 such incidents occurred during this time frame (Gun Violence Archive, 2015); in other words, there was an average of about one mass shooting per day.

In light of these events, this book is a timely and welcome addition to the literature. The chapters, collectively, provide a state-of-the-art snapshot of what we know about the prediction, consequences, and prevention of mass shootings, the media's role in covering them, and interventions for those impacted. Although in many cases what we know is frustratingly little, each chapter hints at promising research and policy implications for the future.

Here, I try to step back and offer some broader suggestions for future directions. The ideas in this chapter reflect my own disciplinary bias as a psychologist and, to some extent, as a social psychologist. However, in many ways psychology is uniquely situated for understanding the complex factors involved in mass shootings. As a “hub” science (Cacioppo, 2007), it intersects with both larger (e.g., sociology) and smaller (e.g., neuroscience) units of analysis, while maintaining a focus on the person. Psychology also has a long history of involvement in the study of traumatic life events (e.g., “shell shock,” Myers, 1915; the 1942 Coconut Grove fire, Lindemann, 1944), as well as eclectic methods and a range of potentially relevant theories. My comments are organized around three central questions: (1) What is unique about mass shootings? (2) How can we minimize the impact of public mass shootings? (3) How can we minimize the likelihood of public mass shootings?

What Is Unique About Mass Shootings?

The roll call of recent high-profile mass shootings noted above highlights their diverse nature. They vary, among other ways, by country (e.g., United States, France), setting (e.g., schools, clinics, churches, concert halls, government buildings, restaurants), number of shooters, and likely motive. What are the common threads that tie these events, and in what ways are mass shootings, collectively, unique among other forms of trauma? It would be surprising if reactions to mass shootings were completely unique, and, indeed, several chapters in this book note parallels with findings from the broader trauma literature – for example, the influence of prior traumatic experiences, degree of exposure to the shootings, social support, coping strategies, and worldview maintenance on subsequent adjustment. But we also know that different types of trauma vary in risk for development of posttraumatic stress disorder (e.g., sexual assault for women; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). What then, compared to other traumatic events, is unique about mass shootings?

Mass shootings, as Smith and Hughes point out in Chapter 1, are a particular form of mass killing, which might also include bombings or knifings, for example. Mass killings, despite their seeming frequency, constitute only a small portion (about 1%) of all homicides in the United States (see Chapter 2). Though the majority of mass killings involve shooting, most mass shootings do not occur in public; public mass shootings amount to only about 12% of all mass killings. School shootings are rarer still, constituting only about 9% of all public mass shootings. Broad references to mass shootings, then, incorporate a wide range of events. Does it even make sense to refer to such a broad, heterogeneous category of killings?

Answering this question requires clarity in what is being studied. Yet, as one moves from chapter to chapter within this volume, the answer is not always clear or consistent. Chapter 2 discusses patterns of *public* mass shootings (including characteristics of shooters), but Chapter 3 offers explanations of mass shootings more generally, including incidents involving suicide (e.g., Guyana), familicide, and felonies (e.g., robbery). One consequence of these varying definitions is differing views on the role of mental illness (e.g., mental illness is a stronger influence in public mass shootings), motive (e.g., to eliminate witnesses in a felony), and number of shooters (e.g., single shooters are more common in public mass shootings). Chapter 4 then discusses “rampage shooters” but does not define initially what is meant by a mass shooting. Most of the examples provided are from *school* shootings, which, as noted above, are a small minority of public mass shootings. Wilson (Chapter 11) discusses mental health outcomes following direct exposure to mass shootings, but in reality the focus is on public mass shootings. Littleton et al. (Chapter 12) examine psychosocial functioning within “shooting affected communities,”

but focus largely on public mass shootings, mostly school-related. The title might also pertain to more common homicides; would anyone argue that Baltimore, for example, with well over 300 documented homicides in 2015, is not a shooting-affected community (Baltimore City Homicides/Murders, 2015)? May and North (Chapter 13) focus on rescue workers responding to “multiple shooting” events, but this term does not distinguish public from more common private mass shootings (e.g., killings occurring in a residence). The problem is not unique to this volume. Orcutt, Miron, and Seligowsk (2014), in a recent review of the impact of mass shootings on individual adjustment, define mass shootings as an individual acting alone with generally personal (compared to political) motivation, entering a densely populated space and killing as many people as possible. Limiting the review to single shooters seems odd, as it excludes such events as Columbine, one of the best-known public mass shootings of the modern era.

A related issue, noted by Smith and Hughes (Chapter 1), is how best to conceptualize *mass* shootings. Some use the FBI standard of four or more victims killed. But this seems arbitrary and, from a research, prevention, and intervention perspective, premature, given the current state of knowledge on these topics. Orcutt, Miron, et al. (2014), in their review of mass shootings, focus on multiple victims irrespective of the number killed, and so include shootings with one death and multiple injuries (e.g., the 1988 Winnetka, Illinois elementary school shooting). Norris (2007), in a previous review of the impact of mass shootings, likewise includes seven incidents that involved fewer than four victims killed.

These definitional and operational ambiguities make it difficult to compare “apples to apples.” Future progress in our understanding of mass shootings will require more precision about the phenomenon of interest.

Broadly speaking, however, the most common ultimate referent throughout this book is public mass shootings. As Wilson notes (Chapter 11), what little evidence there is suggests that public mass shootings may be more traumatic than some other traumatic events. Likewise, Norris (2007) concluded that the effects of (public) mass shootings, versus other disasters, fell into the category of “severe” along a continuum of minimal, moderate, severe, and very severe. These conclusions are not surprising, given that public mass shootings are rare, random, intentional acts of violence that often occur in what are otherwise considered “safe” public spaces (e.g., schools) to ordinarily privileged people (at least in terms of violence exposure). Consequently, public mass shootings receive intense media exposure, which brings its own challenges (see Chapter 10).

However, reliable estimates about the effects of public mass shootings will require not only more studies, but more studies that sample the range of circumstances under which such shootings occur. Consider the events mentioned at the outset of this chapter. If we compare the range of public mass shootings with the range of *studied* public mass shootings, it becomes evident that our current understanding relies heavily on school shootings, especially on college campuses. The affected populations are likely to be younger, more educated,

more white, wealthier, and healthier than the general population; this restricted range on demographic characteristics may be one reason factors such as age, socioeconomic status, and ethnicity are sometimes weak predictors of shooting outcomes. These samples also represent Western cultures. This book admirably extends the focus of mass shootings beyond the United States, but Finland and Norway share key characteristics with the United States; all are what Henrich, Heine, and Norenzayan (2010) refer to as WEIRD (predominantly Western, educated, industrialized, rich, and democratic). Henrich et al. cite numerous examples from psychology of findings generated from WEIRD samples that are moderated by culture. If we look beyond WEIRD cultures, what will we find? Despotis et al. (Chapter 18) note, for example, that the factor structure of the Posttraumatic Growth Inventory may be culture-dependent.

My comments should not be taken as a criticism of the work done to date. Studies of campus shootings have been largely done by researchers who work at these campuses, and have sometimes involved participants who were already undertaking other studies. This makes sense given the logistical, methodological, and ethical challenges of studying public mass shootings (see Chapter 20). We study not only what we feel compelled to study, but what we can study.

Going forward, as we move beyond the level of individual studies to make broader claims, attention to representativeness of the events being studied will be important. So will greater attention to the representativeness of samples. Wilson (Chapter 11) notes that, for understandable reasons, many studies of public mass shootings involve samples dominated by participants less directly impacted by the shootings. High postshooting distress among indirect victims is an important finding in its own right, but it leaves us with an incomplete picture. This range restriction in exposure to the shootings might also help explain the sometimes inconsistent relationships reported between exposure and subsequent outcomes (see Chapters 1, 11, 12).

Public mass shootings may also share certain similarities with other, seemingly related events. Consider the Boston Marathon bombing in 2013, which killed three and injured over 260; it was a rare, random, intentional act of violence in an otherwise safe public space. Or the 9/11 terrorist attacks in the United States. Going forward, comparing public mass shootings with other traumatic events that share a broader threat similarity may hold promise, perhaps via a meta-analysis. This will require articulating what exactly it is about these public traumas that make them uniquely challenging and worthy of attention.

How Can We Minimize the Impact of Public Mass Shootings?

Although mass shootings are horrific events, most people exposed to them eventually return to levels of functioning at or near where they were prior to the incident. This is a tribute to human strength, both individual and collective. It also usually

occurs without the help of formal interventions. For those who pursue formal help, there is solid scientific evidence from randomized control trials (RCTs) that there are interventions (especially Prolonged Exposure [PE] and Cognitive Processing Therapy [CPT]) that work after trauma exposure (see Chapter 15). Though little of this research focuses specifically on individuals impacted by public mass shootings, there is every reason to think, given the underlying theoretical rationale for the treatments, that mass shooting survivors would also benefit.

Unfortunately, not everyone recovers, and those who do may take many months or years. Often people with demonstrable mental health needs choose not to seek or avail themselves of professional help, or drop out during treatment; this is especially true of ethnic minorities (see Chapter 17).

These patterns suggest a number of directions for future research and intervention; there is much more to be learned. Who, for example, is most vulnerable to the effects of public mass shootings, and who is likely to be most resilient? Prospective research designs, combined with advanced statistical techniques such as latent growth mixture modeling, are promising developments for understanding different response trajectories after trauma (Bonanno, Brewin, Kaniasty, & La Greca, 2010; Mancini, Littleton, & Grills, 2015; Orcutt, Bonanno, Hannan, & Miron, 2014; see Chapter 12). They allow for a more nuanced and multivariate understanding of subgroups of survivors, which will help identify those most at risk, and perhaps in need of professional help. Longitudinal designs also allow for better understanding of vexing questions that are difficult to assess cross-sectionally, such as the relationship between vicarious exposure through media and symptomatology (see Chapter 8), or between symptoms and posttraumatic growth (PTG; see Chapter 18).

For those who recover without professional help, how does this take place? As Bonanno et al. (2010) have noted, the impact of trauma usually depends on multiple risk and resilience factors, each of which might have a small to moderate effect, but the combination of which can be powerful. These factors can exist at multiple levels – the individual, their social network, and the larger community (see Chapter 12). Because most people cope with mass traumas without relying on professional help, understanding these informal systems of coping and recovery is essential.

The need for theory

Progress in understanding the impact of public mass shootings, as well as interventions that might help, will require better theoretical development going forward. As Smith and Hughes note in Chapter 1, the dominant conceptual approach has been a dose-response model, but they point to many of its flaws (see also Chapter 11 regarding exposure as a predictor). Other approaches discussed in the book include fear networks, resource conservation, world assumptions, social support deterioration, emotion regulation, and neurological factors

(e.g., serotonergic stimulation). Though each is valuable, there seem to be common themes across the book that might be worth considering as broad ways of thinking about the trauma of public mass shootings.

The importance of meaning making

Mass shootings can pose an existential threat to our basic beliefs about ourselves, others, and the world. Terror Management Theory (Greenberg, Solomon, & Pyszczynski, 1997) and World Assumptions Theory (Janoff-Bulman, 1992) both place a central focus on this threat, as does CPT; meaning is one of three elements of Foa's Emotional Processing Theory (see Chapter 15). Shootings can also disrupt key relationships with others and interfere with central roles (e.g., parent, spouse, worker) that give our lives meaning. Recovery, then, can be seen in part as an attempt to make meaning out of something that has challenged or even shattered one's core beliefs.

This aligns with elements of PE and CPT, each of which emphasizes the importance of cognitive restructuring after trauma. Outside of therapy, other people (e.g., family, friends, reference groups) help provide us with understandings about why things happen, and validate whatever meanings we may adopt. Conflict over meaning is a way that others can be a source of further distress rather than comfort. Reexamination of core beliefs is an element of PTG (see Chapter 18), and can be seen in what Tedeschi and Calhoun (2004) refer to as deliberative rumination (e.g., sense making). Meaning making also aligns with religious coping and spirituality as coping styles related to PTG. Community rituals such as memorials and the social identity derived from a sense of cohesiveness can give meaning after public shootings (see Chapter 12). After the Virginia Tech shootings on April 16, 2007, the poet Nikki Giovanni's widely admired and reproduced convocation address the following day ended with "We will prevail, We will prevail, We will prevail, We are Virginia Tech." Finally, the meaning making lens is well suited for understanding one role that media can play after mass traumas. In addition to answering basic questions about what happened, media often examine why the event occurred, and in doing so can support or further challenge our attempt to make existential sense of the event (see Chapter 7). And "new media" such as Facebook and Twitter allow meaning making to occur in a more overtly interactive way.

The importance of uncertainty reduction

Mass shootings pose an epistemic as well as an existential threat. The uncertainty after public mass shootings can take many forms. For example, immediately, questions arise about one's own safety and the status of loved ones and friends; and subsequently, uncertainty arises about the nature, course, and appropriateness of one's emotions, about explanations for behavior during the

shooting, or about altered role relationships. There is a long history in social psychology of uncertainty leading to heightened social influence (e.g., affiliation, social comparison; Schachter, 1959) as we attempt to understand ambiguous or frightening situations.

There is some overlap here, of course, with meaning making, and the therapy-assisted cognitive restructuring referred to above is sometimes about maladaptive ways that people may have reduced their uncertainty (e.g., illogical self-blame). Uncertainty reduction was an important goal in the comprehensive intervention in Norway after the Oslo bombing and Utøya shootings in July of 2011 (see Chapter 16), both immediately after the incident and continuing over time (e.g., provision of information to families about what happened and allowing them, if desired, a structured visit to the site of the killings). Uncertainty reduction is an ideal way to think about media effects, and about the role of technology. Both positive and negative effects of media exposure and use are noted in Chapters 7–10.

The importance of social relationships

Humans are fundamentally social creatures. Others are a key to our survival, as individuals and as a species; others provide material, psychological, and existential support. Thus, our connectedness to others is central to our existence (Baumeister & Leary, 1995). Public mass shootings can represent a threat to our social relations. And social relationships seem to play a key role in post-trauma adjustment, often for the better but sometimes for the worse.

Examples are numerous. Citing the broader trauma literature, Smith and Hughes (Chapter 1) note that social support facilitates cognitive processing, validates emotional reactions (see above regarding uncertainty reduction), and promotes both formal and informal help-seeking. The role of social support in postshooting adjustment is highlighted at several points in this book. Littleton et al. (Chapter 12) note that, in the Virginia Tech shootings, low preshooting social support predicted postshooting resource loss, which in turn predicted greater subsequent distress. Mancini et al. (2015), also examining the Virginia Tech shootings, reported that a subgroup of 7–13% of women exhibited elevated distress prior to the shootings, then improvement at 2 months that continued 1 year postshooting; one thing that characterized this group was a large increase in postshooting social support. One can speak of social competence in building and holding resources. Therefore, it is not surprising that Cognitive Processing Therapy includes skill development that helps people connect better to others, and to develop trust (see Chapter 15). The Norwegian comprehensive intervention described in Chapter 16 has an interesting social component, with a social support assessment and advice for maintaining and developing support, plus the formation of support groups composed exclusively of families who had also gone through the same bombing-shooting experience.

Chapter 9 discusses social media as a tool for utilizing (and building) social support in ways similar to more traditional face-to-face interactions. Social media can be used to organize postshooting memorial or remembrance events and to stream the events for people who cannot attend, and to create discussion and advocacy groups (e.g., about gun control and mental health after the Virginia Tech shootings). Community building seems especially important after a public mass shooting, which, as a violent, intentional trauma, may represent a unique threat to the fabric of the community. As noted in Chapter 12, emergent properties such as community solidarity may influence individual functioning. Finally, Rosen, Tiet, Cavella, Finney, and Lee (2005; described in Chapter 8) conclude that the association between vicarious trauma exposure through media and problems may “reflect the negative social effects of isolative television viewing habits rather than retraumatization.”

Of course, social relationships can have a darker side. As discussed in Chapter 17, Lepore and Revenson’s social constraints theory (Lepore & Revenson, 2007) highlights social interactions that “cause the trauma survivor to feel unsupported, misunderstood, alienated, and/or unable to disclose traumatic experiences.” And the social support deterioration hypothesis (Kaniasty & Norris, 1995) points to how mass traumas can strain existing networks (e.g., helping others in chronic need can take a toll on the helper).

Taking the above perspectives into account, the impact of public mass shootings is likely to be minimized by naturally occurring processes and formal interventions that enable generative meaning making, reduce uncertainty, and protect or enhance positive social relationships. This analysis has a number of implications for future directions.

It suggests a greater focus on religion and spirituality, because these often intersect seamlessly with meaning making, uncertainty reduction, and social relationships.

It suggests the need for greater breadth in the populations chosen to be studied after public mass shootings; this might include ethnic minorities and non-WEIRD samples, because each may go about meaning making, uncertainty reduction, and relationship maintenance or building differently, or in a way that challenges our current, tentative understandings.

It suggests a greater focus on the role of work in coping with trauma, because jobs can provide structure and give meaning to our lives and serve as an important source of social relationships; work can also have a dark side, adding to the burdens people feel while attempting to cope with mass traumas. In some cases, of course, an individual’s work places them in direct contact with public mass shootings, as in the case of police, rescue workers (see Chapter 13), and journalists (see Chapter 14). The unique challenges of these roles deserve more attention, for what they can tell us about both resilience and risk; there might also be better ways of training workers that could help buffer them in these difficult roles.

It suggests a closer look at other types of role performance around which meaning and social relationships are structured, such as parent or spouse.

It suggests that closer attention should be paid to the timing of interventions, considering their implications for the likely unfolding of meaning making, uncertainty reduction, and social relationships. Ill-timed interventions may be ineffective, or actually worsen functioning and stress (e.g., critical incident stress debriefing (CISD); see Wilson, 2011).

It suggests examining help-giving as well as help-receiving among those impacted by shootings, because assisting others can strengthen social relationships and enhance a sense of pride and meaning. For example, Chapter 15 describes a case study of an elementary school teacher struggling after a school shooting. Her successful recovery with the help of PE eventually leads her to organize a fundraising race to honor victims of the shooting. This illustrates help-giving, action-based meaning making, and, likely, enhanced social relationships (isolation was a problem while she was on leave from work after the shooting). This example is not unusual, as mass traumas typically offer many opportunities for individuals to help others. Help-giving is but one of many potential examples of incorporating findings and concepts from the field of positive psychology. It might also be thought of as an example of action-focused (compared to perceived) PTG (see Chapter 18). In a different vein, help-giving might also make it more likely that people will accept or seek help from others, including professionals, if one barrier to receiving help is a reluctance to become obligated to others, or a sense that one is uniquely needy. Of course, help-giving can have a dark side, as noted by the social support deterioration hypothesis. Understanding what moderates the effect of help-giving on outcomes after public mass shootings would be important.

The above considerations suggest three further methodological points. First, when possible, future research should strive to go beyond the exclusive use of self-report data, especially from a single source. Questions about perceived versus actual PTG, help-giving, and role performance are difficult to assess exclusively via self-report.

Second, in addition to more rigorous quantitative studies (e.g., with prospective designs that are adequately powered), the study of public mass shootings might benefit from greater use of rigorous qualitative research. Qualitative research can be especially useful for hypothesis generation, for illustrating boundary conditions of established claims, and for rich descriptive detail, all of which would be useful in this fledgling literature; theoretically informed qualitative research can also be used for hypothesis testing, of course. Qualitative research might also be helpful for studying shootings where literacy may be a concern, including in international settings, where self-report measures developed and normed in the United States, for example, would be of less value. To those who might think of qualitative research as simply a series of case studies, in many ways one can make the same argument about current quantitative

studies of mass shootings (see Chapter 11). At this point in our understanding of public mass shootings, methodological hegemony is not warranted.

Third, future research on interventions should be mindful that RCTs represent the gold standard for determining treatment efficacy, and therefore should be incorporated whenever possible. Consider the Norwegian intervention described in Chapter 16. The intervention is admirable, remarkable really, in its comprehensiveness. Yet Dyregrov et al. note that very strong grief and trauma reactions persisted over time, along with functional impairment, suggesting the intervention was not very effective. They posit that this was because of the strong stressor (e.g., losing a child to a sudden, violent death) and the intense media coverage of the killer's trial and a subsequent commission report. They also note that outcomes might have been worse without the intervention. All this is certainly possible. But maybe the intervention simply was not very effective or even made functioning worse. Without a control group and random assignment, we do not know. The authors note the desirability of such studies but mention ethical and practical problems. We might consider that there is also an ethical issue in not doing an efficacy study. The Cambridge Somerville Youth Study conducted in the 1930s was a similarly impressive, well-intentioned, and comprehensive intervention, designed to reduce juvenile delinquency, but it failed (McCord, 1978), and actually made things worse (we know this because they did conduct a RCT). In the trauma field, CISD is another example of a prematurely tested intervention (Wilson, 2011).

A more strategic point is that the complexity of public mass shootings should encourage researchers to think about the merits of forming interdisciplinary teams (e.g., psychologists, sociologists, neuroscientists); for the study of public shootings in non-WEIRD populations, international interdisciplinary teams will be necessary.

How Can We Minimize the Likelihood of Public Mass Shootings?

It is easy to get discouraged about the prevention of mass shootings. They seem to occur with an alarming regularity. Moreover, efforts to identify predictors of such shootings, or to build profiles of shooters, are stymied by the problem of false positives. As Winegard and Ferguson note in Chapter 4, for every vague generalization such as the shooter having suffered a recent loss, experiencing a sense of injustice, or being a male under the age of 45, there are almost infinitely more nonshooters with this characteristic. To add to the complexity, predictors likely vary by type of mass shooting (e.g., mass shooting vs. public mass shooting vs. school shooting). And predictors may change over time. Malcolm Gladwell (2015) recently discussed the sociologist Mark Granovetter's theory that thresholds for acting change as more

people do something. The idea is that many people might have the potential to commit a public mass shooting, but reservations or barriers put them below a threshold for acting on that potential. Each new shooting lowers the threshold. The explicit referencing by school shooters to previous school shootings seems to have grown after Columbine, with Virginia Tech often cited too. The implication is that predictors of past shootings, even if they were known, may not prevent future shootings.

Rather than throw our hands in the air in despair, the best approach is to recognize the inevitably poor utility of profiles and to look instead for more proximal indicators like whether someone has made a vocalized threat, regardless of whether they fit some broad profile. Chapter 4 notes the 2002 recommendation of the Department of Education that, for identifying school shooters, the best approach is not to screen and identify individuals far in advance, but to report vocalized threats to authorities, and to encourage others to do so. Cornell and Datta (Chapter 19) describe this approach as less about instruments of prediction and more about interventions with known threats. They note that while threats are not always known, often there is some indication or “leakage” beforehand. The focus is then on the subset of threats that might be carried out because the person has the motivation and means (e.g., has the person acquired a weapon, made a plan, engaged in other preparation?). In contrast to a popular conception of shooters simply “snapping,” usually there is lots of planning. This creates opportunities for prevention, and is a more optimistic view of what we can do.

Some interventions described in these chapters, like programs to reduce bullying, or afterschool programs with physical activity, or intensive early interventions with parents (see Chapter 5), may not prevent mass shootings, but they are important in their own right because they reduce other negative outcomes. They bring to mind Cornell and Datta’s statement (Chapter 19), “True violence prevention efforts must begin well before there is a gunman in the parking lot.”

Going forward, efforts at prevention should also emphasize media education. In its roles of reducing uncertainty and of meaning making, the media, like the general public, seems to prefer quick, simple, “common-sense” answers. Unfortunately, as noted in Chapter 4, many of these answers, like violent video games or mental illness or bullying, do not hold up well as explanations of public mass shootings. As psychologists, we can do a better job of explaining to journalists where not to look, and why; we can also characterize more effective prevention efforts, like threat assessment, in ways that are easier to comprehend.

For the media’s part, it should resist the temptation to be professional stenographers, simply reporting what some people purport to believe without consideration of the scientific evidence behind the claim. This is because, as Winegard and Ferguson point out in Chapter 4, public discussion of the causes of mass shootings is sometimes hijacked by those with other, broader agendas

(e.g., gun regulation, media violence). Sometimes, calls to study *x* are in reality calls *not* to study *y* (e.g., video games instead of guns). Again, media education is essential, as a necessary, if not sufficient, answer to this problem.

Finally, when it comes to prevention of mass shootings, the Federal Government should treat the issue as a public health problem (vs. simply a criminal justice or civil liberties issue), and fully commit the tools of science to understanding and preventing the phenomenon. Haden, in Chapter 6, makes a similar point, as do Cornell and Datta in Chapter 19 and the American Psychological Association (2013) in its report on gun violence. This means, among other things, a serious examination of the role of gun availability in mass shootings. The answers ultimately obtained from such research may not be simple or directly translatable to policy; that is the way science works. But the failure to use the best tools of science to examine all plausible factors in mass shootings is unconscionable. We all deserve better.

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