THE SOCIO-BEHAVIORAL RESPONSE OF SURVIVORS TO CAMPUS ACTIVE SHOOTER EVENTS

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EVENTS

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Abstract: This research uses available secondary data from two incidents on college campuses to analyze survivor behavior in response to campus-based active shooter events. The study employs a qualitative inductive design using grounded theory methodology within a multiple case study strategy. Themes in survivor behavior develop across the cases. The study results in the development of a data-grounded Active Shooter Behavioral Response Model (ASBRM), which traces the behavioral response of survivors from incident recognition to implementation and reassessment of protective behaviors. The model details environmental cues, social cues, and social interaction leading to information gathering activities that result in protective behavior implementation and reassessment. The model shows similar characteristics to models developed to explain behavior in other event types. The theoretical assessment of the ASBRM shows the application of the emergent norm theory of collective behavior with consideration for ecological factors that affect the operation of the model.

The study advances four findings related to survivor behavior in campus active shooting events. (1) Survivor response is social rather than asocial and includes helping behavior between survivors consistent with research findings in other disaster event types. (2) Survivors process environmental cues, social cues, and engage in social interaction to define the situation, gather information, and implement and reassess protective behavior choices within a framework that maintains and extends social and organizational roles. (3) Survivors implement protective behaviors that include taking cover on the floor, running to evacuate, running to shelter, hiding, using available resources to barricade themselves, locking door, turning off lights, and barricading doors. (4) Survivors show group level interaction for confirmation of environmental cues and processing of additional incident cues that lead to: (1) implementation of protective actions and (2) the division of tasks for information gathering and implementation and (3) reassessment of protective behaviors.

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CHAPTER I

INTRODUCTION TO THE RESEARCH PROBLEM, DEFINITIONS, AND RESEARCH QUESTIONS

Active shooter events on college campuses in United States cause loss of life and shatter feelings of safety and security associated with the higher education setting. The U.S. Department of Education's *2012 Digest of Educational Statistics* shows that more than 21 million students attend more than 4,500 degree-granting institutions that employ nearly 3.7 million faculty and staff (Snyder & Dillow, 2012). As a result, these institutions make a significant portion of society vulnerable to attack by active shooters. A 2010 joint report by the U.S. Secret Service (USSS), U.S. Department of Education (DOE), and the Federal Bureau of Investigation (FBI) identify 272 incidents of targeted violence on America's campuses since 1900 (Drysdale, Modzeleski, & Simons, 2010). In general, active shooter events are increasing in frequency and lethality (Blair & Schweit, 2014; Blair, Martaindale, & Nichols, 2014; Blair, Nichols, Burns & Curnutt, 2013; Blair & Martaindale, 2010; Newman & Fox, 2009). With each event, calls for reforms in policy and training dominate public discourse on the issue.

The research problem comes to the forefront when developing response policy, plans, and preparedness guidance for campus Active Shooter Events (ASEs). Policies for preparedness and emergency response develop with underlying assumptions about human behavior. The question arises: Are the assumptions used in developing these policies and guidance for ASEs based in scientific knowledge? Essentially, do proposed plans, procedures, and training reflect the actual behavioral response of victims and survivors or do false assumptions inform policy development?

The focus of this study is on the actions of victims and survivors in the seconds and minutes following the commencement of a campus attack. It examines the immediate aftermath and resultant actions, interactions, and behaviors in sociological terms. This research is critical, as the better we understand this critical time-period, the better that we can establish effective policies and adequate training to assist victims and survivors. The significance of the research lies in its ability to inform planning and response assumptions. Dynes (1993) advises that "planning will be no better than the assumptions and understandings about human behavior in disaster" (p. 179). This research seeks to explore human behavior in response to ASEs to provide empirical evidence to improve plans, training, and policy for campus ASEs.

Many studies and reports of ASEs focus on the shooters, the timeline of events, motivations for the attack, and the performance of responders. These studies and reports at best present a fragmented understanding of these perspectives. The victim and survivor perspective is largely absent. In contrast, this study advances scientific insights on the premise that the motivation for the event is unknown at the time and essentially inconsequential to the victims and survivors. The actions of the shooter and responders

are important as they relate to the behavior of those present, but analysis will not directly focus on those elements. This is not an after-action review, but a focused empirical examination of victim and survivor behavior in response to the introduction of an active shooting event to a college campus.

The introduction of an active shooter to a campus setting changes the social situation. Park and Burgess (1970) describe basic social interaction in an everyday example:

> When people come together anywhere, in the most casual way, on the street corner or at a railway station, no matter how great the social distances between them, the mere fact they are aware of one another's presence sets up a lively exchange of influences, and the behavior that ensues is both social and collective. It is social, at the very least, in the sense that the train of thought and action in each individual is influenced more or less by the action of every other. It is collective in so far as each individual acts under the influence of a mood or state of mind in which each shares and in accordance with conventions which all quite unconsciously accept, and which the presence of each enforces upon the others. (p. 381)

Here, Park and Burgess describe the social and collective influences on behavior in a new social situation. This study focuses on the social situation that emerges on a college campus with the introduction of an active shooter and the subsequent emergency response. Essentially, do survivors socially organize to address the problem or do they

engage in panic flight? How do interactions develop and how do they influence actions? The goal is to understand the actions of survivors in reaction to the threat of an active shooter and the ensuing social and collective behavioral response. The types of behavior exhibited by survivors and the decision process that leads to action are critical for the development of effective response policy. This study addresses a research gap as no direct empirical findings on victims and survivors in response to campus ASEs exist.

Schweit (2013) captures the importance of this time-period for responders in a recent *FBI Bulletin* article. She identifies:

> Responding officers must recognize that in more than half of mass-shooting incidents where a solo officer arrived on the scene—57 percent—shooting still will be underway, with 75 percent requiring law enforcement personnel to confront the perpetrator before the threat ends. And, one-third of those officers will be shot as they engage. (Schweit, 2013, para. 2)

Schweit's statement indicates that, in many cases, responding public safety officials still face the hazard of the shooter. Because of the introduction of the active shooter, survivors will be engaged in reactive behavior when responders arrive. Effective response depends upon accurate understanding of the actions of survivors prior to and during the organizational response. An empirical understanding of the reaction of survivors in an ongoing incident is important for informing the actions of the responders arriving on the scene. Accurate assumptions lead to effective response.

Defining Active Shooter Events

As the academic community has not produced substantive research on the survivor response to active shooters, definitions are limited to the practitioner focus. The Department of Homeland Security (DHS) defines an active shooter as "an individual actively engaged in killing or attempting to kill people in a confined and populated area; in most cases, active shooters use firearms(s) and there is no pattern or method to their selection of victims" (DHS, 2013, p. 2). This definition excludes incidents that begin as targeted violence. Incidents of targeted violence are "violent incidents where both the perpetrator and target(s) are identified or identifiable prior to the incident" (Reddy et al., 2001, p. 157-158). In its 2012 study on active shooters, the New York City Police Department (NYPD) uses the DHS definition but extends it to include "cases that spill beyond an intended victim to others" (NYPD, 2012, p. 1). Blair and Schweit (2014) also modify the definition by removing the term "confined" and extending the term *individual* to *individuals*. A strict interpretation of the original DHS definition excludes active shooter incidents that begin with a specific intended victim, those perpetrated by more than one individual and those that occur outside of buildings. This study uses the modification to the DHS definition by Blair and Schweit (2014) and the NYPD (2012). An Active Shooter Events (ASE) is defined as "individual(s) actively engaged in killing or attempting to kill people in a populated area; in most cases using firearms(s) and includes attacks that may begin with a specific intended victim, but extend to include others."

Defining Campus Active Shooter Events

Identifying the boundaries of the study requires a specific definition of the location of the event. This study examines campus *Active Shooter Events* (ASE). The term campus can connote very different meanings. The definition has two elements. The first is the broad category of the location. The second is its specific location characteristics. This study defines the broad category of the location to the campus of a degree-granting institution in the United States. Degree-granting institutions are:

> postsecondary institutions that grant an associate's or higher degree and whose students are eligible to participate in the Title IV federal financial aid programs. Degree-granting institutions include almost all 2- and 4-year colleges and universities; they exclude institutions offering only vocational programs of less than 2 years duration and continuing education programs. (Snyder & Dillow, 2012, p. 279)

The restriction to degree granting institutions excludes institutions that provide only career and technical programs of less than two years and do not lead to a degree. Defining the population to include only degree-granting institutions provides some consistency in the location type and the policies under which they operate. The *Digest of Educational Statistics* (2012) identifies 4,589 granting institutions in the United States.

The second definitional element of the campus ASE is the specific location characteristics. It is necessary to define the elements of a *campus* of a degree-granting institution. This research uses the definition of campus as outlined in the *Jeanne Clery*

Disclosure of Campus Security Policy and Campus Crime Statistics Act (*Clery Act*). The *Clery Act* defines a campus as:

> (I) any building or property owned or controlled by an institution of higher education within the same reasonably contiguous geographic area of the institution and used by the institution in direct support of, or in a manner related to, the institution's educational purposes, including residence halls; and
>
> (II) property within the same reasonably contiguous geographic area of the institution that is owned by the institution but controlled by another person, is used by students, and supports institutional purposes (such as a food or other retail vendor).

Defining Victims and Survivors

The term *victim* as it is used herein describes those killed by the perpetrator. The term *survivor* includes those who are present at a campus ASE, may or may not have been injured, and take some type of protective action. Protective actions include escaping from the area, hiding/choosing to remain silent or still, closing doors, locking doors, moving furniture, and verbally and/or physically confronting the perpetrator. Extending the term survivor to include those who take protective action and are not injured is not intended to diminish the sacrifice of those seriously injured, but simply to catalog the actions of those present. The inclusive term allows for ease in description, negating constant differentiation. The study targets those present and their individual and collective actions in response to the campus ASE. While physical and social location in

relation to danger is a key issue, the general term will be inclusive of all those present who take protective action.

Focus on Victims and Survivors

The approach of this study is a departure from the ASE literature examined in the following chapter. The limited research focuses on the perpetrator and/or organizations and policy. A survivor-centric focus is essentially absent from empirical research on ASEs. This study uses a survivor-centric approach consistent with studies in the field of disaster sociology to address this research void.

The following chapter uses extensive studies of survivor behavior in other event types as a proxy for the study of ASE events. Empirical studies of the behavioral response to fires, bombings, and other emergencies provide the theoretical basis and methodology for the study of ASEs. Studies of these events using the sociological concept of collective behavior and the Emergent Norm Theory (ENT) provide the means to explore behavior in ASEs. The following chapter reviews the findings of these studies and their outlines their applicability to the ASE environment. The chapter also examines limited research on ASEs to provide context and characteristics for these events.

Research Questions

This opening chapter frames the study's focus on survivor reactions to campus ASEs. The second chapter further develops the research questions, which are presented below as a starting point, with the basis for the questions refined in the following two chapters. As no empirical studies of survivor behavior in response to active shooting

events exist, this research is unique. With the research context provided by a review of disaster sociology studies, the research questions for this study include:

1. What are the processes involved in collectively defining the socio-behavioral response to ASEs?
2. How do social interactions and social organization emerge among survivors in a campus ASE?
3. What type of protective behaviors do survivors of campus ASE exhibit?
4. How do decisions for protective behavior arise among survivors in ASE?

The questions guide inquiry into the socio-behavioral aspects of the campus ASE. These questions seek to fill a research gap for incident response to active shooter events. As previously identified, this topic has not been subject to previous research. The results of the research inform the assumptions on human behavior, which is critical for the development of effective policy and practice for preparedness and response to campus ASEs.

CHAPTER II

LITERATURE REVIEW

The reaction of survivors to ASEs has not been the subject of previous empirical research. In general, research exists on disparate aspects of school shooting events in multiple fields of study. Muschert (2007) identifies that "to date there is no unified body of knowledge about such events." (p. 60). This statement remains true eight years later. As such, this chapter reviews the limited ASE findings pertinent to the research questions of this study. This chapter uses the Disaster Research Center (DRC) C-Model to organize the review of literature. As such, the examination of ASEs literature focuses on the chronology, characteristics, and conditions (independent variables) affecting outcomes. As the survivor response to ASEs has not been the subject of previous research, the majority of the review centers on disaster sociology research that targets behavior in other event types. The findings related to behavior in these events serve as a proxy for understanding human behavioral reactions in ASEs.

This chapter begins with an overview of the concepts and theory used to inform behavioral research on disasters. Second, it briefly reviews the DRC C-Model. The third section, with several sub-sections, extensively reviews behavioral findings of disaster

research relevant to the study of ASEs. The final section reviews the limited research focused on ASE events that provide context to the study.

Collective Behavior, the Emergent Norm Theory, and Disaster Studies

As described, the reaction of survivors to ASE events has not been the subject of previous study. As a result, this section of the review focuses on the theory used to study behavior in similar event types. The focus remains on the theoretical level. It examines the sociological concept of collective behavior, the Emergent Norm Theory (ENT) and its development through additions over time. The following sections examine specific findings of studies that employ the described and other similar theoretical constructs.

Generally, collective behavior is a field of sociology that "focuses on sequences and patterns of interaction that emerge in problematic situations" (Lang & Lang, 1968, p. 556). These interactions occur within a collectivity. A collectivity is a group of people "who have a sense of solidarity by virtue of sharing common values and who have acquired an attendant sense of moral obligation to fulfill role-expectations" (Merton, 1957, p. 299). Problematic situations are "those in which participants lack adequate guides to conduct" (Lang & Lang, 1968, p. 556). In his chapter on collective behavior and disaster research, Wenger (1987) draws the distinction between general sociological study of collective behavior and its use in the study of disasters. Wenger argues that the field developed from studies concerning nontraditional, non-institutionalized behavior or emergent behavior focusing on crowds, social movements, public behavior, and cults. The emergent norm perspective then became the key theoretical approach informing sociological research of disaster events.

The Emergent Norm Theory (ENT) developed in contrast to earlier approaches to collective behavior. Early approaches, the contagion and convergence perspectives, assumed some manner of homogeneity in participant characteristics. Contagion proffers that homogeneity of behavior spreads through the collectivity similar to the spread of a communicable disease. The convergence approach assumes latent homogeneity that surfaces in the presence of the group. Smelser (1962) also advances the "value added" approach to collective behavior. This approach argues that six factors: (1) structural conduciveness, (2) structural strain, (3) a generalized belief, (4) precipitating events, (5) mobilization for action, and (6) social control activities are necessary for collective behavior. Lewis (1972) uses the value-added approach to identify and examine the "hostile outburst" at the National Guard shooting at Kent State (p. 95). Wenger (1987) identifies "value-added" as macro approach to collective behavior within the contagion and convergence orientations. The key difference between ENT and other approaches resides in its recognition of the collectivity as a heterogeneous group of actors. The ENT approach contrasts, as it proposes that individual differences remain, but unanimity comes in response to an event that falls outside of existing norms for behavior.

ENT views behavior as a function of norms. In circumstances where existing norms are not sufficient to guide behavior, new norms emerge from a process of interaction. ENT focuses on "the conditions and sequences under which a new special rule comes to be recognized and accepted as the basis for coordinated response" (Turner, 1964, p. 394). In this view collective behavior comes about when "the situation is ambiguous and to some degree unstructured; the participants do not initially share clear-cut, pre-existing expectations as to how they should behave; the outcome of the episode

appears uncertain" (Turner & Killian, 1972, p. 79). How they should behave develops out of the interaction process. Based on symbolic interaction (Blumer, 1969), the process results in a collective definition of the situation and norms for behavior.

Figure 2.1 details the ENT interaction process. The process begins with a precipitating event in a setting that affects people with diverse motivations and personal characteristics. First, the affected collectivity engages in a "milling" process (Turner & Killian, 1987), which they describe as a physical and verbal process where: "people ask each other questions about what they have seen and heard and answer with bits of information, guesses, and theories. In communicating they move about first talking to one person, then another" (p. 55). The key questions their behavior implicitly addresses include: (1) what is happening? (2) what should be done?(3) who will act first? (Turner & Killian, 1972).

Keynoting is the next stage in the process. In this stage, keynoters provide a definition of the situation (Thomas, 1928) and a suggested course of action that the group evaluates. A succession of keynoters may provide alternatives, giving a number of potential courses of action for selection. As a result of the milling and keynoting process, "the emergent definition of the situation and a proposed line of action begins to take normative character" (Turner & Killian, 1972, p. 89).

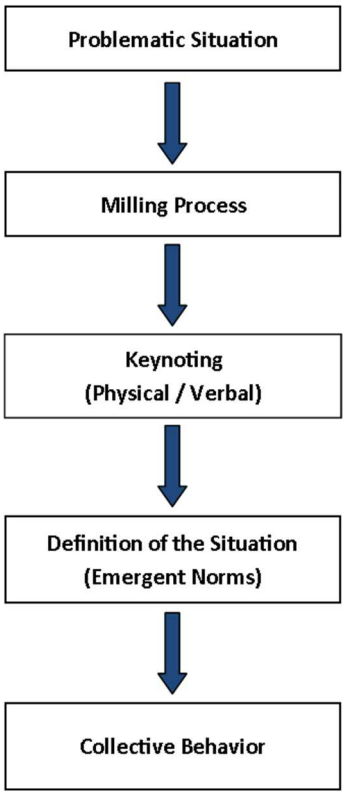

Figure 2.1. The Emergent Norm Process. This figure shows the emergent norm process as developed from descriptions by Turner & Killian (1987).

Evans (1969) is critical of the collective behavior field describing it as "long on taxonomy and speculative explanation and short on demonstrable propositions and formulas that would allow any kind of prediction" (p. 2). Tierney (1980) is also critical of analysis in the ENT perspective. She describes problems in clarity and testability, particularly its definitional element as the presence of an emergent norm (Tierney, 1980). Berk (1972) notes that the focus on conditions and consequences leads to gaps in recognition of the core characteristic behaviors. Weller and Quarantelli (1973) seek to close these gaps and advance a model of collective behavior as an enhancement to ENT. The model, Figure 2.2, includes elements of social relationships (existing or emergent) to

distinguish between institutionalized and collective behavior. The model distinguishes collective behavior as a result of emergent social relationships, emergent norms, or both. Weller and Quarantelli (1973) explain that "social organization not only 'contains' social action, it also provides a foundation of social norms and relationships upon which action is built" (p. 675).

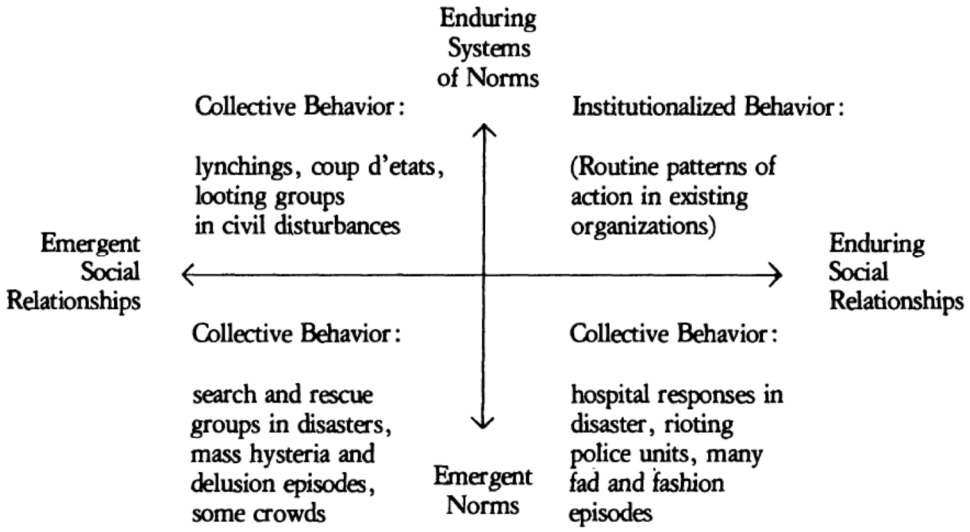

Figure 2.2 Socio-Organizational Dimensions of Collective Behavior. In Weller, J. & Quarantelli, E. (1973). Neglected characteristics of collective behavior. *American Journal of Sociology*, 79, 665-685. This figure shows the relationship between enduring and emergent social relationships and norms.

The addition of social organization as a concept with the ENT collective behavior paradigm increases measurable elements. The addition of structural elements addresses concerns raised over the testability of ENT concepts. In the third edition of their landmark work, Turner and Killian (1987) explicitly include social structure as a defining element. Turner and Killian (1987) explain that it was implicit in earlier conceptions of

ENT, but make it explicit in their most recent edition. In subsequent research, observable/ testable elements included social organization. For example, Neal and Philips (1988) define collective behavior as "the development of emergent norms and/or emergent social structures in a relatively spontaneous situation" (p. 233). Collective behavior and ENT provide a method to describe and explain behavior in times of collective stress. The sections that follow show many studies that examine events similar to ASEs using collective behavior and ENT.

The Disaster Research Center (DRC) C-Model

This literature review uses the DRC C-Model as a framework (Quarantelli, 1987; 2002; Phillips, 2014). The C-Model developed from disaster fieldwork and the effort to build complete case studies of events. The model consists of four elements: conditions, characteristics, consequences, and chronology. Table 2.1 describes the model elements as originally developed by Quarantelli (1987) and described by Phillips (2014).

Table 2.1

Disaster Research Center C-Model

Element	Description/ Example
Characteristics	What are the features of the individual, organization, or community?
Chronology	How did the event or process unfold over time? (story of the event)
Conditions	What pre-existing contexts produced physical and social vulnerability? What kinds of social, economic, environmental or political factors influenced how the event unfolded? How did factors impact the outcomes? (critical independent variables)
Consequences	What are the obvious and less obvious outcomes of the event, interactions, processes or decisions? (These may be manifest, latent, positive, and/or negative)

Source: Phillips, B. (2014). *Qualitative Disaster Research*. New York: Oxford University Press.

The following review of relevant disaster research in other events types seeks to identify the *conditions* (independent variables) that affect behavior in disaster. In the absence of ASE specific behavioral research, behavior expectations developed from studies of similar events is the only option. Later sections of this chapter review the limited ASE specific research. The review segments the research by location type to focus on the K-12 campus environment, college campus environment, and research that cuts across ASE events in all locations. The purpose is to develop understanding about the basic *chronology* and *characteristics* of ASE events.

Conditions Affecting Active Shooter Events (ASEs):

Disaster Research Findings

For more than sixty years, disaster research has studied human behavior in response to events such as earthquakes, tornadoes, hurricanes, floods, fires, and more recently, terrorism. Initial post-World War II research sought to understand the human reaction to disaster as a proxy for the effects of nuclear war (Fritz & Williams, 1954; Fritz & Marks, 1957). Similarly in this study, we review behavior-based studies of disasters as a proxy for ASEs. This is not without issue. First, Quarantelli (1981a) describes the term disaster as a sponge word or concept without a consensus definition. Two volumes seeking a definition failed to reach consensus (Quarantelli; 1998; Perry & Quarantelli, 2005). One of the key issues in defining disasters is the problem of scale (and of which variables) (Quarantelli, 2008). The debate focuses on the application of findings to events of larger scale (i.e. drawing distinction between disaster and catastrophe). For ASEs, the question of scale also applies. Second, disaster researchers also question the applicability of findings to conflict-crisis events (Quarantelli, 1993;

2008). ASEs are conflict-based events. As a result, both issues affect the study of ASEs and the application of previous research findings. With this understanding, the review of conditions proceeds in two sections. The first section and associated sub-sections, Collective Behavior in Disaster: Research Findings, examine studies that specifically target behavior in response to threatening conditions where the survivors are immediately present. The second section, Disaster Warnings and Evacuations: Research Findings, reviews summary works from the large body of research on warnings and evacuations. Both elements are present in an ASE. Survivors may react to the initial event where they directly receive environmental or social cues or to official warnings broadcast in the campus environment.

Collective Behavior in Disaster: Research Findings

Studies of collective behavior in disaster use qualitative, quantitative, and mixed research methods. This section reviews research findings using all three methods. In addition to findings, the review of quantitative studies also focuses on the design and conceptualization of dependent and independent variables or *conditions* related to collective behavior in disasters. The review centers on studies designed specifically to target collective behavior. Secondarily, the discussion includes studies that contain collective behavior as an element, despite a focus on other aspects of events. The review begins with a discussion of the general structure of disaster studies that target collective behavior. It continues with reviews of major studies of the field.

Researchers generally construct studies of collective behavior in disasters to identify one of two basic behavior sets. The research generally examines a social

situation in disasters to determine if the human response is social or non-social in nature. A social or pluralistic (Giddings, 1920) response is characterized by behavior within existing or developed norms, some type of social organization, and enactment of role expectations. The non-social or breakdown response manifests in panicked, irrational, competitive behavior with the goal of "self-preservation at all costs" (Johnson, Feinberg, & Johnston, 1994, p. 168). The non-social response ignores patterns of behavior expected by social norms (Quarantelli, 1957). Just as the term disaster is overused and subject to interpretation, so is the term *panic*. Quarantelli (1981b) describes panic in sociological terms as "social relationships and expectations are disregarded…the strongest ties of a primary nature, such as close family members, may be shattered and the most socially expected behavior patterns may be ignored" (p. 9). Panic behavior is the target, feelings of extreme fear that do not manifest in overt measurable behavior are not panic per se. Quarantelli (1957) describes a of measurable panic behavior as:

> fairly well divested of all or almost all of his socially acquired characteristics. He is thought of as behaving in a completely irresponsible or antisocial manner, blindly trampling over people in a way analogous, if not completely similar, to the way animals act in a wild and chaotic stampede. The fleeing is visualized as irrational and nonfunctional or maladaptive to the dangerous situation. The uncritically acting participant is conceived as having little awareness of how or why he is running, or often because of his emotional state of terror, what he is running from. (p. 188)

Quarantelli's conception is generally termed as *non-rational flight* or *panic flight*. The classics of disaster research describe panic and non-rational flight as extremely rare in disasters. Personal misunderstanding and media frames of disaster perpetuate myths of non-social response to disasters (Wenger, Dykes, Sebok, & Neff, 1975). These continue today in the post-9/11 terrorism-centric environment (Tierney, Bevc & Kuligowski, 2006; Tierney, 2003).

Despite the reported rarity, panic flight and/or partial breakdown in social behavior can and does occur. Quarantelli (1954) describes the conditions for panic to develop "as a result of a feeling of possible entrapment, a perception of collective powerlessness, and a feeling of individual isolation in a crisis situation" (Quarantelli, 1954, p. 275). Quarantelli (1954) describes the social interactions that can lead to a non-social response in that "the more progressive the crisis, the greater the possibility that interaction with others will lead to a definition of the situation as one involving potential entrapment" (p. 274). Also through interaction, "the responses of the others, however, indicate that they, too, are powerless or have even suffered the consequences, panic becomes probable" (Quarantelli, 1954, p. 274). The characteristics of active shooter events provide the possibility to meet Quarantelli's conditions for panic.

More likely are the mid-range conceptions that developed in response to the rarity of panic behavior as conceptualized by Quarantelli. In order to explain group-level processes, some gradation developed within the research between the extremes of the social and non-social responses. Quarantelli (1981b) notes, "panic may be at the extreme end of some behavior continuum" (p. 20). Johnson and Feinberg (2001) advance a sequential breakdown of social bonds. They explain that "status relations should

breakdown in a sequential fashion, with the primary ties such as within nuclear families breaking down last, if at all, and the requirements of the citizen role – the norm of civil behavior, even to strangers being the first to break down" (Johnson & Feinberg, 2001, p. 3).

Mawson (1980) and Sime (1983) advance an affiliative model of flight behavior. In their conception, flight may occur toward the danger in an effort to reunite with those with whom individuals have the closest social bonds. Affiliation also extends beyond the group to the familiarity of the place (Sime, 1985). This conception advances that greater threat leads to a more social and less individualistic response. Drury, Cocking and Reicher (2009) argue for the application of a self-categorization model to groups that develop in emergencies. The self-categorization model advances:

> that feeling and acting with others as part of a group…operates through *self-categorizations* (definitions of what makes us unique) to shared collective self-categorizations (definitions that classify us with others)…categorizing oneself with others tends to heighten perceptions of similarity and unity with others…shifts from 'me' to 'we' means greater commitment and loyalty to the group. (Drury et al., 2009, p. 71)

These mid-range explanations provide greater clarity to group-level process in response to life-threatening emergencies (Aguirre, Torres, Gill & Hotchkiss, 2011). One of the unique problems to this area of study is addressing the unit of analysis. The group or individual level of analysis creates issues for study design and the application of theory. While ENT focuses on the group level, it requires individual interaction. The

affiliative model and self-categorization model operate more on the psychological rather than sociological side of behavior. Studies also apply similar designs to the organizational level. For example, a study reviewed in following sections applied organizational emergence concepts (Quarantelli & Dynes, 1968) down to the enactment of individual employee roles (Johnson & Johnston, 1989). Studies focus on different analytical levels, but result in cross-applicability of findings.

Collective behavior in fires: Studies of the Beverly Hills Supper Club fire.

The most studied single disaster event for collective behavior is the 1977 fire at the Beverly Hills Supper Club (BHSC) in Southgate, Kentucky. Estimates vary in the number of total patrons at the club when the fire started, 2,200 and 2,400. Ultimately, the fire resulted in 165 deaths. At least five empirical studies examine separate aspects of the event or utilize different methods to understand behavior in response to the fire (Johnson, 1988; Johnson & Johnston, 1989; Johnson, Feinberg & Johnston, 1994; Feinberg & Johnson, 2001; Cornwell, 2003). The studies use the same data source: transcripts of interviews conducted by Kentucky State Police in the investigation of the fire. The multiple studies show a convergence in behavior related findings with application of different methods.

The first empirical study of the fire by Johnson (1988) is a seminal qualitative work in the disaster field. Johnson uses qualitative methods to analyze the interview transcripts. Using Quarantelli's (1954) conception of panic, Johnson finds "no evidence...of family members abandoning each other in order to facilitate their own survival…in fact there are instances of both family members and friends assisting others

when to do so constituted a threat to their own lives" (Johnson, 1988, p. 24). The findings indicate that social bonds are important in preventing non-social competition during the evacuation (Johnson, 1988).

Johnson and Johnston (1989) examine employee occupational roles during the fire and evacuation. As previously described, role fulfillment is a core element of social organization and collective behavior. The results show that during the fire, employees' extended occupational roles consistent with the expectations of their daily role (Johnson & Johnston, 1989). Servers were more likely to engage in person-centered helping activities within their work areas only, showing responsibility toward customers they served (Johnson & Johnston, 1989). The findings also show gender disparity in activities. Males were more likely to engage in fire control activities and females were more likely to engage in person-centered helping. Management was also more likely to instruct female employees to leave the building. Johnson and Johnston (1989) describe that "despite their lack of training, the employees at Beverly Hills effectively directed evacuation from the building, and employees followed directions when received" (p. 49). The findings show no evidence of social breakdown or panic among employees only role extension to necessary pro-social helping activities.

Johnson, Feinberg, & Johnston (1994) examine social response based upon social bonds and entrapment threat. The quantitative study tests three models of expected behavior to include the social and breakdown models described above. The final model, the severe threat model, combines the social and breakdown models. The model proffers that social response continues until the point of severe entrapment threat, and then social breakdown begins. The study tested the three models using a seven-factor social response

index as the dependent variable. A six-category variable identified social bonds. An ordinal variable measured entrapment threat coded from no threat to severe threat (0-4). The results show a connection between social bonds and social response, providing support for the social model. When controlled for location within the club, the researchers find evidence to support the severe threat model in the Crystal Room. The Crystal Room faced the most severe threat of entrapment. Johnson, Feinberg, and Johnston (1994) find decreasing social responses when threat increases. This supports Quarantelli's conception of panic in situations with increasing threat of entrapment. This research reinforces ecological aspects of location in relation to threat as a factor in social response behavior.

As described above, Feinberg and Johnson (2001) present a model for sequential breakdown of social ties (based on social bond strength). They show the first to breakdown is the general citizen role and the last is the familial role. In between they describe "breakdown is expected to occur in the other relationships: occupational roles, age or gender roles, secondary group ties, and weaker ties to primary group members such as less closely related family members and friends" (Feinberg & Johnson, 2001, p. 271). They test three models with survival rates as the dependent variable. The models include the social and breakdown models described earlier and a third partial breakdown model. The independent variables include family ties, age, gender roles (escorted or escorting), and status (employee or guest) with adjustment for risk (proximity to exits). The analysis focuses on those present in the largest venue, the Cabaret Room. Each model contains expectations concerning survival rates. For example, the maintenance of social order model would show similar survival rates for males and females. The inverse

would be true for the complete breakdown model. Feinberg and Johnson (2001) find evidence to support the social organization model in survivorship rates. They caveat the finding with the following:

> We are not arguing that all the norms inherent in the organizational model held throughout the evacuation process…those norms influenced enough of the occupants…for a sufficiently long period as the evacuation began and continued, so that any breakdown in the social order-if it occurred-happened so late in the process as to have no *observable* consequence for survival…social organization-specifically roles and status relations-endure even during the flight from calamitous fires. (Feinberg & Johnson, 2001, p. 293)

Cornwell (2003) authored the final in a series of studies examining the Beverly Hills Supper Club Fire. Cornwell (2003) uses multivariate analysis to examine fatality risk for those with primary ties (blood, marriage, or dating relationships) to determine if social bonds (quantity & strength) increased risk of death. He finds that fatalities occur in blocks, groups either survived together or died together as a function of the strength of the social bonds between them (Cornwell, 2003). In addition, Cornwell (2003) finds that ecological factors such as the location where evacuation begins also influences the fatality risk of the group. This finding is discussed below in Cornwell (2001).

Beyond Beverly Hills: Collective behavior in other disaster events.

The BHSC fire is one of the most researched single disaster events. Studies of additional events and event types advance our understanding of the behavioral reactions

to disaster. In contrast to the review above, organized around a single event, the remaining review develops around key themes in findings from empirical studies of disaster events. The list of events, in Table 2.2, is not exhaustive, but illustrative of a range of events with empirical findings related to collective behavior in disasters. This section discusses findings related to the themes of helping behavior, role maintenance/ extension, pre-existing social relationships, risk perception and prior knowledge of disaster location.

Table 2.2

Studies of Disaster Events with Collective Behavior Related Findings

Year	Event	Research Author(s)
1973	Summerland Fire - Isle of Man Great Britain	Sime, 1985
1979	Who Concert Stampede - Cincinnati, OH	Johnson, 1987a
1987	Kings Cross Fire - London, Great Britain	Donald & Canter, 1992
1992	Gas Explosion - Guadalajara, Mexico	Aguirre, Wenger, Glass, Diaz-Murillo, & Vigo, 1995
1993	World Trade Center (WTC)Bombing - New York, NY	Aguirre, Wenger, & Vigo, 1998
1994	Sinking M/V Estonia - Baltic Sea	Cornwell, Harmon, Mason, Merz, & Lampe, 2001
2001	WTC Terrorist Attack - New York, NY	Gershon, Magda, Reily, & Sherman, 2011
2003	Station Nightclub Fire - Warwick, RI	Aguirre, Torres, Gill, & Hotchkiss, 2011
2005	London Terrorist Bombings - London, Great Britain	Drury, Cocking, & Reicher, 2009

Helping behavior.

As described previously, panic behavior is rare. All studies note an absence or extreme limited occurrence of the Quarantelli conception of panic behavior. In the

absence of panic behavior, researchers generally observe helping behavior. Drury et al. (2009) define helping behavior as "anything done or said with the purpose of assisting another" (p. 75). Quarantelli and Dynes (1977) add that these actions "are not performed as a part of a normal occupational role in an everyday social organizational context" (p. 4). Studies operationalize helping behavior to include: comforting others, physically helping people up, helping people walk or move, providing information or directions, providing first aid, providing survival provisions (life jackets, water, etc.) (Cornwell et al., 2001; Drury et al., 2009).

Research findings in these studies result from mixed-methods or qualitative research methods. Quantitative results alone that show disparity in survival rates among gender and other groups may present prima facie evidence of social breakdown. However, Cornwell et al. (2001) present a strong argument for the importance of ecological factors. The factors may statistically mask helping behaviors and the maintenance of social roles. Cornwell et al. (2001) describe in the sinking of the M/V Estonia that "exceptional situational factors figured heavily into this interference, ultimately creating the appearance of selfish or maladaptive behavior to the outside observer" (p. 21). In this case, the speed of sinking, listing ship movement, unrestrained moving objects, and inclement weather affected the ability of victims and survivors to help others. Quantitative results showing disparities in survival rates among gender groups and crewmembers could provide evidence of panic non-social behavior. However, qualitative analysis of survivor accounts showed numerous examples of helping behaviors restrained by the ecological conditions of the event. Aguirre et al. (2011), also using a mixed methods approach in the examination of the Station Nightclub fire. They

describe that "many of the victims who died competed with each other for egress from the building, but our findings show that they were helping each other until the very end" (Aguirre et al., 2011, p. 114). The findings of Cornwell et al. (2001) and Aguirre et al. (2011) show the importance of qualitative crosschecks of quantitative findings.

Pre-existing social relationships and collectivities.

Individuals form collectivities in response to disasters for several reasons. Cornwell et al. (2001) identify that victims and survivors seek group affiliation in disasters for the purposes of (1) facilitating understanding of ambiguous cues and (2) to help decide a course of action and survival strategy for the group. Sime (1983) also finds that in fires victims and survivors develop a group, rather than individual survival strategy. The role of pre-existing relationships is an element of several studies. The influence on the specific dynamics of group formation is unknown. Several studies do identify pre-existing social relationships as building blocks for emergent social structures (Sime, 1983; Aguirre, 1995). Mack and Baker (1961) identify that "interpretation of the signal varies with the type of primary group within which the individual is situated at the time the signal is presented" (p. 47). Another known influence of pre-existing relationships is that victims and survivors will put themselves at risk to find and join members of their close social networks before evacuation (Sime, 1983; Aguirre, 1998; Gershon, 2011; Aguirre et al., 2011).

Role enactment, maintenance, and extension.

Role enactment is a defining characteristic of a collectivity (Merton, 1957). On a daily basis, individuals juggle many overlapping social roles (gender, familial,

occupational, etc.) and manage multiple-group memberships. Early disaster research identifies that strain develops between roles that could lead to abandonment of occupational and other non-primary group roles (Killian, 1952). Later research identifies that social roles simplify in disaster, minimizing conflict and strain (Dynes & Quarantelli, 1986). Research also indicates the maintenance of gender and familial roles in disaster. Donald and Canter (1992) and Johnson (1987) report maintenance of gender roles in two different event types—fire and crowd incident. Others present findings related to the maintenance/extension of occupational roles. Several of the reviewed studies identify findings consistent with Johnson & Johnston (1989), regarding the maintenance and/or extension of employee roles (Cornwell et al., 2001; Drury et al., 2009; Aguirre et al., 2011). These studies conclude that employees maintain and extend their occupational roles in disaster situation to assist other survivors. Gershon et al. (2011) also note the impact of emergent leaders as an extending role in the 2001 World Trade Center evacuation.

Risk perception.

Several studies identify aspects of risk perception in their findings. Describing the general role of risk perception, Slovic (1987) states:

> the ability to sense and avoid danger is necessary for the survival of all living organisms. Survival is also aided by an ability to codify and learn from past experiences. Humans have additional capability that allows them to alter their environment as well as respond to it. This capacity both creates and reduces risk (p. 28).

In the case of the disaster events examined in this chapter, Aguirre et al. (1998) and Gershon et al. (2011) both find that those who perceived danger more quickly started evacuating earlier than those who did not. Also noted within the general research on risk perception is the moderating effect of the group. Dozens of studies in both risk perception and disaster research on warnings show that evidence contrary to initial beliefs is often disregarded (e.g., Douglas & Wildavsky, 1982). Sime (1983) and Aguirre (2011) note delays in the recognition of ambiguous cues of danger when with a group when compared with those who were alone. The research is not conclusive as to whether the lack of recognition resulted from disregarding evidence or attention diverted to the group.

Prior knowledge of the disaster location.

Studies also find prior knowledge of the disaster location as a significant factor. Prior knowledge or limited knowledge can have differing impacts on response. The knowledge can be limited, such as experience with only a single entry or exit, or the experience can provide additional options to a group facing a risk. For example, Aguirre et al. (2011) find less risk of injury for those who had visited the Station nightclub prior to the fire. Although the finding does not explore this aspect in further detail, previous visits could provide information about the facility that informs options for action. Sime (1983) shows how knowledge and routine can also limit actions. He notes that if a "particular fire escape route is not in regular use and unfamiliar that it is less likely to be used in a fire" (Sime, 1983, p. 39). If they are unfamiliar with other options, many victims and survivors attempt to exit by the same method they used to enter (Sime, 1983; Aguirre et al., 2011). Others note the facility knowledge of employees in both directing others and taking routes known to them (Sime, 1983; Cornwell et al., 2001; Drury et al.,

2009; Aguirre, 2011). Aguirre et al. (1995) also find that individuals with local knowledge about victims became keynoters in the development of emergent search and rescue operations during the response to the Guadalajara gas explosion.

ASE Conditions: Disaster Warnings and Evacuations—The Research Findings

The previous sections of this chapter examine specific empirical studies of human behavior in response to events when they are physically present in close proximity to the danger. Another major component of both disaster and campus ASE response is warning others not immediately present at the site of the danger. As a result, the body of disaster research focused on the response to warnings is also instructive with respect to the research questions. The paragraphs that follow review findings related to *official warnings*, but the role of *unofficial warnings* are also considered. The review also examines recent studies that link other event type research specifically to warnings in campus ASEs.

This review does not specifically examine each of the volumes of empirical studies that exist on the warnings. It reviews findings replicated in numerous studies and captured in summary works. Key summative works by Mileti (1975, 1999), Drabek (1986), Quarantelli (1990), Mileti and Sorensen (1990), Lindell and Perry (1992), Sorensen (2000), and Sorensen and Vogt-Sorensen (2007) synthesize volumes of literature and distills them to identify key variables and processes. This research catalogs the reactions to official warnings received from a variety of sources, but generally initiated by response organizations. In campus ASEs, warnings may come through official sources, such as from universities, law enforcement, or alternative unofficial

sources such as social networks. Parker and Handmer (1998) define unofficial warnings as "processes whereby people warn those within their personal networks…passing messages by official sources; by actively seeking information from their networks; through personal observation of environmental precursors" (p. 47). The research findings in this section focus on the response to official warnings; however, as shown it is a socially mediated process. This makes it extremely difficult to separate official and unofficial warning processes.

The research shows the reaction to official warnings as a several step process. Generally, the pattern includes hearing or receiving the warning message, understanding the message, believing the message, personalizing the message, deciding and responding to the message, and socially confirming the message (Mileti & Sorensen, 1990). Figure 2.3 captures the process as conceptualized by Quarantelli (1990). These elements include the key aspects described above, focusing on the social and environmental confirmation aspects. The social mediation of warnings through the milling process is consistent with the ENT theory of collective behavior.

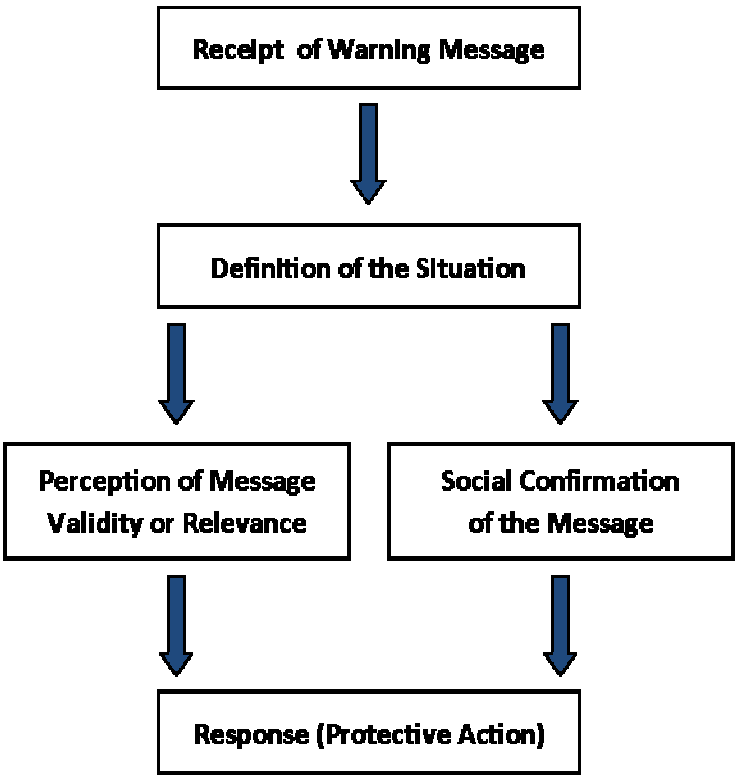

Figure 2.3. General Warning Message Reaction Pattern (Adapted from Quarantelli, 1990 and others). Flow chart shows the reaction pattern to warning messages.

In addition to the general warning reaction pattern above, Lindell and Perry (2004, 2011) advance the Protective Action Decision Model (PADM). The model captures the method that people use to make decisions for implementation of protective behaviors. Lindell and Perry (2011) describe the PADM process as:

> Environmental cues, social cues, and socially transmitted warnings initiate a series of pre-decisional processes that, in turn, elicit core perceptions of the environmental threat, alternative protective actions, and relevant stakeholders. These perceptions provide the basis for protective action decision making, the outcome of which combines with situational

> facilitators and impediments to produce a behavioral response. In general, the response can be characterized as information search, protective response (problem focused coping), or emotion focused coping. In many cases, there is a feedback loop as additional environmental or social cues are observed or warnings are received. The dominant tendency is for such information to prompt protective action decision making, but information seeking occurs when there is uncertainty at a given stage in the protective action decision-making process. Once the uncertainty is resolved, processing proceeds to the next stage in the process. (p. 617)

The model consists of a pre-decisional stage where environmental cues, social cues, information sources, the information channel, warning messages, and receiver characteristics feed into a pre-decisional process. Exposure to the hazard, attention and comprehension of the information feed into individual threat perceptions, protective action perceptions, and stakeholder perceptions to make decisions on the implementation of protective actions. Situational factors that facilitate and impede affect the behavioral response (information search, protective response, emotion-focused coping). The PADM model applies to pre-event hazard adjustment and the behavioral response to emergency period warnings.

Sorensen (2000) cataloged variables influencing warning behavior from dozens of empirical studies. Table 2.3 details these variables categorized by level of empirical support and directional influence. Quarantelli (1990) captures many of these variables in the model above (Figure 2.3). Mileti and Sutton (2009) assert that not all warning variables are equal. They identify message content, repetition, confirmatory

environmental cues, and the social aspect of milling to confirm the message with others as most important (Mileti & Sutton, 2009). Mileti and Sutton (2009) find demographic variables as less critical.

Table 2.3

Variables Related to Warning Response

Variable	Direction of Effect
Physical Cues	Increase
Social Cues	Increase
Knowledge of Hazard	Increase
Experience with the Hazard	Increase
Education	Increase
Family United	Increase
Kin Relations (number)	Increase
Community Involvement	Increase
Ethnic Group Member	Decreases
Age	Mixed
Socio-Economic Status	Increase
Personal vs. Impersonal Warnings	Increase
Message Specificity	Increase
Frequency	Increase
Message Consistency	Increase
Message Certainty	Increase
Source Familiarity	Increase

Note: Adapted from several sources including: Sorensen, J. (2000). Hazard warning systems: Review of 20 years of progress. *Natural Hazards Review*, 1, 123.

Warning research directly applies to ASEs as warning is a function of incident response. Initial response to ASEs may include directions to lockdown or shelter-in place. Authorities broadcast directions through media, local alerting systems, and Computer Mediated Communication (CMC) applications to smart phones and cellular phones. The

findings of this specific research on campus warnings for ASEs are instructive for response. The research provides an understanding of the process and key *conditions* that affect the receipt, social interpretation and decision to action for warning messages in ASE events. The most important variables in ASEs are likely physical and social cues, proximity to threat, personal versus impersonal warnings, message certainty, message specificity, and source credibility and familiarity.

Due to advances in personal communication technology, the Virginia Tech shooting provides one of the first opportunities to study the use of CMC in ASEs. The use of smart phones, social networking sites, and microblogging over the last decade emerged as significant issues for research in emergency management under the area of *crisis informatics* (Palen, Vieweg, Liu, & Hughes, 2009). Several studies examine the use of CMC during ASEs. Single case studies include the Virginia Tech shooting (Vieweg, Palen, Liu, Hughes, & Sutton, 2008; Palen et al., 2009) and the University of Texas – Austin (UTA) shooting (Li, et al., 2011). Two studies use multiple cases design. The first examined shootings at Johns Hopkins University Hospital, Middle Tennessee State University, and UTA (Heverin & Zach, 2012). The second examined the shootings at Virginia Tech and Northern Illinois University (Palen & Vieweg, 2008). The results of these studies show an on-line convergence (Fritz & Mathewson, 1954) and development of collective intelligence in closing gaps for unknown information. For example, Vieweg et al. (2008) show the construction of an accurate victim list online prior to the official information release.

While the studies generally focused on the development of information in the period following the direct crisis and into recovery, the application for emergency

response is clear. Heverin & Zach (2012) describe the application, "as a crisis unfolds, communications among individuals are a way of providing the information needed to bridge the cognitive gaps" (p. 37). CMC provides information for that purpose. Essentially, CMC aids the process of sense making (Palen & Vieweg, 2008; Heverin & Zach, 2012) According to Weick, Sutcliffe and Obstfeld (2005) sense making "involves turning circumstances into a situation that is comprehended explicitly in words and that serves as a springboard into action" (p. 409). Weick (1993) applied sense making to decision processes in emergencies in his research on the Mann Gulch fire.

CMC provides information for decision-making for those that have time to access on-line sources during crisis. Palen et al. (2009) outline the process in the Virginia Tech shooting explaining that "it was not until news of the second shootings became known that the information seeking activities became more pressing—for some, this was during the time of the shooting when they heard gunshots, but for those removed from the site of the crisis, this was not until about 10:16 EDT when an e-mail advisory to stay inside was sent" (p. 8). In addition, they describe the use of CMC for information gathering "students who were told to stay inside (and found phone lines taxed from high traffic), turned to text and instant messaging (IM)…IM provided both concurrent and passive ways of communicating" (Palen et al., 2009, p. 8). Additional research by Sattler, Larpenteur & Shipley (2011) examines the use of email and text messages for campus alerts. They find that text and email messages are effective for notification and provision of instructions to affected populations during ASEs (Sattler et al., 2011).

Overall, research shows that survivors will seek information in both the response and recovery period of ASEs. The advent of personal connectivity through the

proliferation of smart phones provides an opportunity for instant communication with survivors. Targeted communications can provide information to survivors to assist in decision-making during ASEs.

Characteristics and Chronology of Active Shooter Events (ASEs)

Empirical research on ASEs began in earnest following the 1999 Columbine High School shooting. These studies focused on school shootings in the Kindergarten-High School (K-12) environment. Following the Virginia Tech shooting, this expanded to studies of higher education campus settings. ASEs at locations beyond educational institutions also captured public attention. As a result, research developed more generally to include the phenomenon regardless of specific event location. Although presented chronologically above, the following review does not develop in the same manner. The review centers on the general topic of event location and then focuses down to the target location of this study, the campus environment. The goal of this section of the review is to understand the general characteristics and chronology of ASEs as they relate to the campus environment. The review first examines findings about ASE events across location types. The review then focuses on K-12 schools and finally the higher education campus environment. Although limited in scope, the review provides an understanding of the basic characteristics and chronology of these events.

In the post-Columbine period, disconnected research appeared in a number of academic fields. These include: criminology, medicine, education, political science, psychology, sociology, and media studies. Researchers sought to understand the basic characteristics of school based ASEs and devise methods for early detection, evaluation and pre-incident intervention of potential perpetrators. Many of these findings are not

specifically relevant to the research questions outlined in this study. The results, however, do provide context for research on ASEs.

ASE research also suffers from definitional issues. Such issues affect other fields, such as described in the study of disasters. Over the course of more than fourteen years of ASE research, definitions abound. Definitions for ASE type events include those couched under the term (1) *targeted violence* (e.g. Vossekuil, Fein, Reddy, Borum, & Modzeleski, 2002), (2) *rampage shootings* (e.g. Newman et al., 2004), (3) *active shooter* (e.g. DHS, 2013; NYPD, 2012), (4) *workplace violence* (e.g. Baron & Neuman, 1998), (5) *hybrid targeted violence* (Frazzano & Snyder, 2014) and (6) *public mass shootings* (Bjelopera, Bagalman, Caldwell, Finklea, & McCallion, 2013). Definitions are critical for the inclusion and exclusion of cases (Quarantelli, 2001). These definitional differences influence the direct applicability of findings. Academic division and disparate definitions fragment ASE research and impact the generalization of findings.

ASE Research across Location Types

Limited research focuses on ASEs across full the spectrum of attack locations. Following high profile shootings at locations other than educational institutions, research focused across event locations. Shootings at the Trolley Square Mall in Salt Lake City, Utah (2007), Fort Hood, Texas Army base (2009), a public interaction event for Congresswoman Gabrielle Gifford in Tucson, Arizona (2011), the Century 21 Movie Theater in Aurora, Colorado (2012), Los Angeles International Airport (2013), Washington, DC Navy Yard (2013) and Columbia Mall, MD (2014) focused public attention and fueled additional research.

Major reports by the NYPD (2010 & 2012), a book, and several reports by Blair and co-authors are the major works detailing the phenomenon across location types (Blair & Schweit, 2014; Blair et al., 2014; Blair et al., 2013; Blair & Martaindale, 2010). The reports focus on varying time-periods and present analysis regarding locations, frequencies and event characteristics including casualties and police response. The NYPD (2012) report develops its analysis based upon 324 identified ASEs that occurred between 1966 and 2012. Of the 324 events, 230 had sufficient information for specific analysis. The analysis revealed information about the shooters, incident locations, and casualties. The report identifies that 98% of ASEs were a single attacker and 36% used more than one weapon. A broad range of sophistication went into the attacks. Some included detailed pre-planning and defenses and others were impulsive. It also reports that active shooters are most often members of the communities they target. Seventy-four percent (74%) of the shooters had some type of relationship: 38% professional, 22% academic, 6% familial, and 8% other. Twenty-six percent (26%) had no known relationship. The per-event descriptive statistics include a median casualty number of two (3.1 casualty average) and median number wounded of two (3.9 wounded average). The event locations include: schools (24%), open commercial areas (24%), office buildings (11%), factory/warehouse (12%), and other (29%). These frequencies show that schools do not make-up the majority of ASE locations. The resolution of the events showed that they were resolved by (1) applied force (43%), (2) suicide or attempt (40%), (3) no applied force (16%), and (4) attacker fled (<1%).

Analysis by Blair et al. (2014) included 110 ASE events that occurred in the United States. between 2000 and 2012. The sample is essentially a sub-set of the entire

body of shootings from 1966 examined in the NYPD report. Similarly, they find that 94% of the attacks were by a single shooter using pistols (59%), rifles (26%), shotguns (8%), and an unknown weapon (7%). The attackers used multiple weapons (33%), improvised explosive devices (3%), and wore body armor (5%). In 55% of the incidents, the shooter had some relation to the attack location. Although coded differently than the NYPD report, Blair et al. (2014) find ASEs located in businesses (40%), schools (29%), outdoors (19%), and other locations (12%). They also reported a median number of people shot per event as five. The median response time for law enforcement was three minutes.

In addition to the contextual issues, Blair et al. (2014) provided deeper analysis of event resolution. The results show that 49% of the events (n=51) ended before the arrival of law enforcement. Of those, 17 ended through actions by the survivors. The survivors either physically subdued the attacker (n=14) or shot the attacker (n=3). This analysis is important to the research questions of this study. It shows previous actions by survivors in response to ASEs include physically attacking the shooter with or without weapons. The location of ASE events showed a similar distribution with educational environments ranking second in frequency (n=39–24%).

Blair and Schweit (2014) examine active shooter incidents in the U.S. occurring between 2000 and 2013. They analyze 160 events in the period that shows an increase in frequency (6.4 incidents/year during the first seven years, 16.4 incidents/year in the last seven years) resulting in 1,043 casualties (486 individuals killed and 557 wounded). They identify 107 incidents (66.9%) that ended before law enforcement arrived and engaged the perpetrator. In incidents where specific timing could be determined, (n=64), 69% (44)

ended in 5 minutes or less (23 ended in 2 minutes or less). For event resolution, they find that in 65 incidents (40.6%), citizen action or shooter suicide ended the event. In 21 incidents (13.1%), unarmed citizens restrained the shooter. Specific to the higher education environment, Blair and Schweit (2014) find 12 incidents resulted in 60 killed and 60 wounded. The incidents resolved through one of four methods: (1) apprehension at the incident site (n=5, 3 by police officers, 1 by off-duty officers, 1 by off-duty mall security), (2) the shooter committing suicide at the scene (n=4, 3 before police arrival, 1 after), (4) the shooter killed by police at the scene (n=2) and (n=1) fled and was apprehended by law enforcement at a different location. The key finding of this study supports the overall goal of this research. Blair and Schweit (2014) advise that, "the active aspect inherently implies that both law enforcement personnel and citizens have the potential to affect the outcome of the event based upon their responses" (p. 7).

The ASE research shows that events in general have fewer casualties than the largely known and publicized events like the 32 deaths at Virginia Tech and the 26 deaths at Sandy Hook Elementary School. Although examples from educational settings dominate public attention and discourse, the research also shows that ASEs occur more frequently in other location types (businesses). As shown, the limited research does provide the basic characteristics and chronology of ASEs across location types. Overall, the body of research shows little development in analysis beyond basic descriptive event statistics.

ASE Research and the K-12 School Environment

More focused research developed on ASEs in the K-12 school environment. The first in a series of post-Columbine academic inquiries into the phenomenon came from social scientists within the United States Secret Service (USSS) National Threat Assessment Center (NTAC). The NTAC extended its focus from targeted violence and assassination to study school-based shooting events. The study resulted in a two-part comprehensive report. The first part known as the *Safe Schools Report* focused on analysis of perpetrator and event characteristics (Vossekuil et al., 2002). The companion document focused on the "how to" of identification and threat assessment process for potential perpetrators (Fein et al., 2002). The study examined 37 incidents of targeted violence at schools (K-12) between 1974 and 2000. Table 2.4 details the ten findings of the report.

Table 2.4

Findings: The Final Report and Findings of the Safe School Initiative. Implications for the Prevention of School Attacks in the United States

Finding	Description
1	Incidents of targeted violence at school rarely are sudden, impulsive acts.
2	Prior to most incidents, other people knew about the attacker's idea and/or plan to attack.
3	Most attackers did not threaten their targets directly prior to advancing the attack.
4	There is no accurate or useful profile of students who engaged in targeted school violence
5	Most attackers engaged in some behavior prior to the incident that caused others concern or indicated a need for help.
6	Most attackers had difficulty coping with significant losses or personal failures. Moreover, many had considered or attempted suicide.
7	Many attackers felt bullied, persecuted, or injured by others prior to the attack.
8	Most attackers had access to and had used weapons prior to the attack.
9	In many cases, other students were involved in some capacity.
10	Despite prompt law enforcement responses, most shooting incidents were stopped by means other than law enforcement intervention.

Source: Vossekuil, B., Fein, R., Reddy, M., Borum, R., & Modzeleski, W. (2002). *The final report and findings of the safe school initiative: Implications for the prevention of school attacks in the united states*. Washington, DC: U.S. Secret Service & U.S. Department of Education.

The findings target the questions of "why did this happen?" and "how do we prevent future incidents?" This is the focus of much of the K-12 ASE research. Of interest to the research questions of this study are findings related to the resolution of events. The report identifies that most "school-based attacks were stopped through intervention by school administrators, educators, and students—or by the attacker stopping on his own" (Vossekuil et al., 2002, p. 27). Although these events are not campus ASEs as defined in this study, the results are of interest. The findings provide

some information related to the actions of survivors in these events. The report advises that "in about one-third of the incidents, the attacker was apprehended by or surrendered to administrators, faculty, or school staff (27 percent, n=10) or to students (5 percent, n=2)…just over one-quarter of the incidents were stopped through law enforcement intervention (27 percent, n=10) (Vossekuil et al., 2002, pp. 27-28). The findings do not elaborate, but the apprehension of the attacker as an action of survivors is important to the present study. Evidence related to incident duration supports the method of incident resolution. The report details that almost half of the incidents lasted fifteen minutes or less and one-quarter lasted five minutes or less. The findings conclude that "the fact that it was not through law enforcement intervention that most of the targeted school violence incidents studied were stopped appears in large part to be a function of how brief most of these incidents were in duration" (Vossekuil et al., 2002, p. 28). This conclusion links the method of resolution to the length of time of the incident. The incident timeline then also potentially influences the behaviors of survivors.

One other major study marks the post-Columbine focus on the K-12 environment. A National Academy of Science (NAS) (2003) study presents seven case studies of ASEs in schools (Moore, Petrie, Braga, & McLaughlin, 2003). Newman, Fox, Harding, Mehta, and Roth (2004) use two of the cases from the NAS study and develop them in greater depth and detail. This study offers similar design to the larger NAS study. The cross-case analysis used in both studies reveals similar findings to the report by Vossekuil et al. (2002). Newman et al. (2004) do advance a theory of rampage shootings that consists of "five necessary, but not sufficient conditions" (p. 229). Table 2.5 details the conditions.

Table 2.5

Conditions for Rampage Shootings

Condition	Description
1	Shooter perceives himself as extremely marginal in the social worlds that matter to him.
2	Shooter suffers from psychosocial problems that magnify marginality.
3	Cultural scripts provide a model for problem solving where the shooter believes unleashing the attack will solve the dilemma.
4	Surveillance systems intended to identify troubled teens fail.
5	Weapons are available to the shooter.

Source: Newman, K., Fox, C., Harding, D., Mehta, J., & Roth, W. (2004). *Rampage: The social roots of school shootings*. New York: Basic Books.

The findings from these reports show the focus on prevention. While the research findings in the K-12 environment did not result in a shooter "profile," it focused its prevention efforts on open communication in the school community to facilitate sharing information. The prevention goal asserts that known information and warning signs feed into the threat assessment process for analysis and evaluation of potential perpetrators.

ASE Research and the Higher Education Campus Environment

Following the Virginia Tech shooting, some limited research expanded to focus on ASEs in the higher education environment. The following review focuses on two specific topics: event context and mitigation. The joint USSS, DOE, and FBI report (Drysdale et al., 2010) on campus attacks provides context (herein referred to as the *Campus Attacks Report*). The *Campus Attacks Report* anchors research on the phenomenon in higher education settings, providing a broad overview of event characteristics. The second topic in the review is unique among ASE research, as it

focuses on mitigation through facility upgrades. Other studies in the post Virginia Tech shooting period examine legal issues related to liability, mental health issues, and changes in preparedness and planning aspects for ASE events (Fox & Savage, 2009; Greenburg, 2007). The following review focuses on general chronology and characteristics most relevant to the context and research questions of this study.

The *Campus Attacks Report* provides context to the understanding of campus active shooter events. The report serves as an initial bridge between the intensive study of the K-12 environment in the *Safe Schools Report* and the problem presented by active shooters in the higher education campus environment. They note important differences between the K-12 and campus environment for prevention. The differences include campus size, number of buildings, irregular student schedules, faculty separated by departments, and differences in social setting (Drysdale et al., 2010). Newman and Fox (2009) also note that due to age, college shooters are typically in more advanced stages of serious mental illness.

The *Campus Attacks Report* provides an overview and analysis of event characteristics with a focus on prevention. Table 2.6 details the major observations of the report. It does present some problems for direct application to ASE due to definitional issues. The report examines events defined as targeted violence and directed assaults. ASEs are inclusive of those events; however, the broad inclusion limits the direct applicability of findings. This illustrates the definitional issue for ASE research identified earlier in this chapter.

Table 2.6

Targeted Violence Affecting Institutions of Higher Education

Observation	Description
1	Incidents of targeted violence are a year-round issue. Campus safety resources may be required throughout the calendar year, not just during the academic year.
2	On-campus targeted violence is not the only challenge, as 20 percent of the incidents took place off-campus or in non-campus IHE locations against targeted IHE members. This suggests that communication between campus safety professionals and municipal law enforcement agencies is essential.
3	Of those incidents that occurred at on-campus or non-campus sites (n = 217), 36 percent took place in administrative/academic/services buildings, 28 percent took place in residential buildings, and 27 percent took place in parking lots or campus grounds. On campus mitigation plans should equally cover responses to IHE buildings, IHE operated residences, and IHE parking lots and grounds.
4	Only 3 percent of on/non-campus attackers (n = 217) moved between buildings. Of those that were carried out within the same building (n = 159), only 4 percent of the attackers moved to different locales (e.g., classrooms, offices, hallways). Though much attention has been given to the phenomenon of the "traveling" attacker, in context, it actually is a rare event. This finding may have tactical and strategic ramifications for first responders and emergency management professionals.
5	Firearms and knives/bladed weapons were used most frequently (75 percent) during the incidents. The remaining 25 percent of the incidents involved strangulation, blunt objects, poison, vehicles, explosives, incendiary/arson methods, or physical assaults without a weapon. Understanding the varied weapons used in these incidents may prompt investigators to look beyond whether a subject possesses or has access to a more traditional weapon (firearm or knife) when evaluating his or her risk.

Source: Drysdale, D., Modzeleski, W., & Simons, A. (2010). *Campus attacks: Targeted violence affecting Institutions of higher education*. U.S. Secret Service, U.S. Department of Homeland Security, Office of Safe and Drug-Free Schools, U.S. Department of Education, and Federal Bureau of Investigation, U.S. Department of Justice. Washington, DC

The report identifies descriptive statistics of the campus locations of ASEs, with the majority split between academic/administrative buildings, residential buildings, and

campus grounds/parking. This is of importance for the context of campus ASEs. Also of consequence is the fact that few of the events moved between locations on campus. The analysis shows most remained in the same building, and few (3%) moved to different areas within the single building. Therefore, most targeted violence and directed assaults occurred in a single building and single location within that building on campus. The broad scope of the definition used for case inclusion affects direct applicability of findings to this study.

The final topic related to the campus environment is mitigation for ASE events. A unique study by Ergenbright and Hubbard (2012) examines factors influencing the rate of kill of active shooters with a focus on the campus setting. They define the rate of kill as the "rate at which victims are killed by an active shooter during a given incident" (Ergenbright & Hubbard, 2012, p. xx). The study examines 14 U.S. campus ASE cases to identify facility upgrades that improve survivability. Ergenbright and Hubbard (2012) recommend a five-element Victim Initiated Mitigation (VIM) system. A VIM system is:

> A mechanism by which a victim or potential victim can initiate a combination of immediate mechanical lockdown responses accompanied with a standardized emergency response resulting in the containment and control of Target Areas and Threat Zones, as well as activation of a standardized Emergency Action Plan. (Ergenbright & Hubbard, 2012, p. xxi)

The elements of the system include: (1) an emergency call box that is centrally located in all public areas of the university (e.g., classrooms, lecture halls, hallways, meeting rooms,

outdoor areas, and offices), (2) electromagnetic door releases, (3) a staffed Incident Command Center, (4) A handheld device that is capable of being directly networked to any emergency call box located within the ICC, (5) RFID (Radio Frequency Identification) key fobs and proximity card readers (both are methods for rapid building entry without the requirement of keys) to allow responder access (Ergenbright & Hubbard, 2012). The recommendations do not clearly describe how this system would function within existing requirements for fire egress. Regardless of the practical ability for implementation, the study shows the first departure in focus from prevention and response to mitigation. The research is of interest as it offers the opportunity to link mitigation measures to the impact of ecological factors on behavioral response (Cornwell, 200; Cornwell et al., 2003).

Research Questions and Propositions from the Literature

The literature review develops an understanding of human behavior in response to a number of other specific event types. The review shows the limited specific research on ASEs in general and an absence of findings beyond the warning function. Using other event types as a proxy, the literature review develops the following propositions from the literature related to the research questions. The research questions and propositions from the literature for this study include:

1. What are the processes involved in collectively defining the socio-behavioral response to ASEs?

   Propositions from the literature:

P.1.1. The response is social rather than asocial with an absence or isolated incidence of panic behavior.

P.1.2. The response includes helping behavior among survivors.

2. How do social interactions and social organization emerge among survivors in a campus ASE?

   Propositions from the literature:

   P.2.1. The survivor response includes information seeking behavior to interpret environmental cues and warning information through interactions with others present and those in other social networks.

   P.2.2. The survivors socially organize to deal with a new problem and decide on protective behavior implementation.

   P.2.3. The survivors show maintenance and extension of social roles.

3. What type of protective behaviors do survivors of campus ASE exhibit?

   Proposition from the literature:

   P.3.1. The survivors exhibit a range of behaviors appropriate to the situation, which include evacuation, shelter, and information seeking behavior.

4. How do decisions for protective behavior arise among survivors in ASE?

   Propositions from the literature:

   P.4.1. The survivors show interaction for social confirmation of environmental cues.

P.4.2. The social interaction between survivors leads to decisions and division of labor for implementation of protective behaviors.

Summary

This chapter examines the theory that informs specific research on behavioral response to disaster events. The emergent norms approach forms the theoretical basis for the behavior-based studies of disaster. The review also examined limited existing research on ASEs for the purposes of establishing basic *chronology* and *characteristics* of ASEs. As shown, the fragmented research extends little beyond simple descriptive event statistics. ASE research extends to many issues unrelated to the research questions of this study, specifically to issues of prevention. Due to an absence of research on the specific research questions of this study, the review uses the findings from other disaster events as a proxy to understand the *conditions* of ASEs. The review examines several studies of the landmark fire at the BHSC. Those studies, which employ different methodological approaches, provide a basis for understanding the human collective reaction to disasters. In addition, the review examines findings in nine other studies of disaster events for themes in human behavior. The themes include, helping behavior, pre-existing social relationships, role maintenance/ extension, risk perception, and prior knowledge of the disaster site. Finally, the review examines research on warnings as an element of the response to ASEs. The review shows the warning process as socially mediated with important variables identified as message content: repetition, confirmatory environmental cues, and the social aspect of milling to confirm the message with others as most important. The review of the literature develops basic propositions from the literature for

the identified research questions. This review forms a basis of knowledge concerning both ASEs and the human reaction to disaster events and warnings of impending events.

CHAPTER III

RESEARCH METHODS

As previously described, the reaction of survivors to campus ASEs has not been the subject of empirical research. The literature review in Chapter II presents studies related to the research questions using mostly other event types as a proxy for campus ASEs. The review shows that these are generally studies of single events. Broader understanding derives from the analysis of multiple studies of different event types with varying research designs, but overlapping findings. In general, the various research designs and diverse construction of dependent variables in deductive studies present a fragmented understanding of the immediate emergency period.

Disaster studies that target social organization, which were reviewed in the previous chapter, proceed from three basic research designs. The first is a deductive approach that tests hypotheses based on the identified theoretical approaches to social organization and collective behavior (e.g., Emergent Norm Theory, etc.) within the context of a single event. The second is an inductive approach that generates theory out of the data within the context of a single event. Among the reviewed studies, Johnson (1987, 1988) and Aguirre et al. (1995) use an inductive approach to the research.

The third is a mixed methods approach that uses qualitative methods to check quantitative findings (Cornwell et al., 2001).

This chapter describes the research design and methodology for this study. It first reviews the research issues specific to the study of ASEs. Second, it details the basic research design and approach. Third, it presents an overview of the case study approach and the selection of cases for examination. Fourth, it provides a survey of data sources and procedures for data analysis and cross-case analysis. Finally, it addresses ethical issues, credibility, and trustworthiness of the findings.

Active Shooter Events: Challenges for Research

No perfect design exists for research. Design issues compound when conducted outside of controlled laboratory settings. Studying events that generate intense national interest and present civil and criminal legal ramifications creates additional challenges. Just as in any research project conducted outside of the lab setting, both event specific constraints and limited research resources influence study design. Both issues affect this study.

Several event specific constraints affect the study of ASEs. Disaster research recognizes that much of the key study data is perishable (Bourque et al., 1997; Phillips, 2002; Quarantelli, 2002; Michaels, 2003; Stallings, 2007; Phillips, 2014). The situational constraints posed by ASEs affect the ability to conduct quick-response research in the field. A concurrent criminal investigation and research inquiry are not likely due to the nature of the event. Early research action could interfere with the criminal investigation unless researchers embed with law enforcement agencies. Due to the nature of criminal

investigations, this is an unlikely scenario in any crime-based event. Access at this stage of an event is essentially impossible. If researchers later seek assistance from law enforcement agencies to gain access to personnel for interviews and collection of archival data, the start of an academic inquiry before the conclusion of the criminal investigation would be unlikely to secure cooperation. Also, examining events where the criminal investigation has not concluded increases the potential that researchers may become part of criminal or civil litigation related to the event. These situational constraints preclude early entry into the field for intrusive data collection.

In active shooter events, the situational constraints can carry on for many years after the incident. As reviewed in Chapter II, Newman et al. (2004) conducted one of the few comprehensive studies of school active shooter events in Jonesboro, Arkansas and Paducah, Kentucky. The U.S. Congress commissioned and financially supported the study. Despite having both the financial support and the prestige of a congressionally mandated study, the authors faced several issues with respect to design and implementation due to situational constraints. Newman et al. (2004) describe several issues with data and data collection. First, they show the difficulty in obtaining interview participation even three years removed from the incident. They write that "civil litigation naming many of the people we interviewed was still pending on appeal at the time of our fieldwork, which discouraged the participation of a number of key figures who may someday be able to contribute their perspectives" (Newman et al., 2004, p. 321). Second, Newman et al. (2004) outline potential problems with collected interview data. The authors describe complications with informant recall due to four issues: (1) inconsistent or inadequate memory, (2) the traumatic nature of the event, (3) substitution of media or

information heard around town for what they actually knew, and/or (4) the content of what they shared is affected by a vested interest in a particular characterization of the event (Newman et al., 2004). The study by Newman et al. (2004) demonstrates the impact of situational constraints on ASE research. These support Killian's (2002) assertions about interview data for disaster research in general. Killian (2002) explains that "interview responses of disaster victims may be especially subject to faulty and retrospective distortion and reconstruction" (p. 53). These distortions can come from the influence of the media, community action and discussion, and litigation. In this specific example, despite both the prestige of a Congressional mandated study and adequate fiscal and personnel resources, the situational constraints of ASEs limits access to informants and raise questions about the reliability of retrospective interview data.

The research design described in the following section develops with an understanding of these limitations. The design uses approaches by Johnson (1988), Johnson and Johnston (1989), Johnson et al. (1994), Feinburg and Johnson (2001), Cornwell (2003) and Aguirre et al. (2011), originally established in studies of similar event types and using similar data. These established methods, coupled with non-reactive measures (Webb et al, 1966, 1981) work to minimize identified methodological challenges.

Research Design

The situational constraints of ASEs and limited available research resources affect the research design. As this is study is only nominally funded, resources for significant engagement with field interviews is impossible. In addition, the length of time since the

events presents many potential issues with interview data as described above. Within these constraints, this study design seeks to answer the following research questions:

1. What are the processes involved in collectively defining the socio-behavioral response to ASEs?
2. How do social interactions and social organization emerge among survivors in a campus ASE?
3. What type of protective behaviors do survivors of campus ASE exhibit?
4. How do decisions for protective behavior arise among survivors in ASE?

As these questions have not been the subject of previous research, the study employs a qualitative inductive design using grounded theory methodology (Glaser & Strauss, 1967; Strauss & Corbin, 1998). Strauss and Corbin (1998) describe the qualitative method as a "nonmathematical process of interpretation, carried out for the purpose of discovering concepts and relationships in raw data and then organizing these into a theoretical explanatory scheme" (p. 11). This description shows the method is particularly useful to study areas where "little is known" or to obtain "intricate details about a phenomenon" (Strauss & Corbin, 1998, p. 11). Both elements apply to these research questions. As Chapter II demonstrates, the reaction of survivors in other event types has been the subject of previous empirical study. The transferability of these findings to campus ASEs is an underlying assumption of this study. This occurs within the framework examined in Chapter II through the discussion of Quarantelli's (1993) comments on crises of conflict and consensus.

Strauss and Corbin (1994) define grounded theory as "a general methodology for developing theory that is grounded in data systematically gathered and analyzed. . . . Theory evolves during actual research, and it does this through continuous interplay between analysis and data collection" (p. 273). Grounded theory has a long tradition within disaster research. Quarantelli (2002) advises that what early studies of disaster developed through trial and error at the Disaster Research Center (DRC) is similar to what became the grounded theory methodology.

Within the qualitative inductive paradigm, this design employs a multiple case study strategy (Yin, 2009). Yin (2009) defines a case study as "an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (p. 18). This study examines the reactions of survivors within the context of the campus ASE. ASEs provide an appropriate contextual setting for the use of the case study strategy. The design combines the qualitative inductive approach, case study strategy (Yin, 2009), and grounded theory methods (Glaser & Strauss, 1967; Strauss & Corbin, 1998). Eisenhardt (1989) argues that the strategy applies best to the early stages of research on new topics or for fresh perspectives on existing topics. This study potentially provides both. The survivor reaction to ASEs is an unexplored area, but occurs within the context of existing theory and research findings in other event types.

Several of the studies outlined in Chapter II examine a single event type "case study" and employ a deductive approach based upon existing theory. This research design adds to the literature through the examination of multiple cases simultaneously and inductively in order to derive theory on human behavior in response to campus

ASEs. Multiple case studies, with each serving as a "distinct experiment", provide a strong foundation for the development of theory (Eisenhardt & Graebner, 2007, p. 25). Hancock and Algozzine (2006) and Stake (1994) refer to this design as a collective case study. Miles and Huberman (1994) refer to this as cross-case analysis. The landmark study by the National Research Council (2003), *Deadly Lessons: Understanding Lethal School Violence* uses a multiple case study design to examine school shootings. Sullivan and Fullilove (2003) argue that school shootings provide a "textbook example of a research situation in which case studies are not merely a default position but the proper tool for the job at hand" (p. 353). This shows strong support for the use of the multiple case study approach for the empirical examination of ASEs.

The presentation of cases in Chapter IV develops using the Disaster Research Center (DRC) C-Model as a framework (Quarantelli, 1987; 2002; Phillips, 2014). The C-model developed from disaster fieldwork and efforts to build complete case studies of events. This study uses the C-model for the same outcome. Table 2.1 in Chapter II of this study outlines the specific elements of the C-model. The four elements--conditions, characteristics, consequences and chronology—form the basis of each case. The development of cases in Chapter IV begins with the chronology of the event (Phillips, 2014). It then proceeds through the remaining elements of the model.

Existing theories of collective behavior and human behavior in disaster inform, but do not drive research and analysis in this study. Strauss and Corbin (1994) explain "if existing theories seem appropriate to the area of investigation, then these may be elaborated and modified as incoming data are meticulously played against them" (p. 273).

The deductive tests of ENT in studies described in Chapter II are relevant and provide context. However, ENT does not drive design or analysis.

Case Study Strategy and Selection of Cases

The selection of campus ASEs occurs within a historical and policy context. Although mass shootings occurred before the Columbine High School shooting in 1999, it stands as a watershed event. Due to the historical and policy implications of the ASE at Columbine, it serves as a time boundary for case selection. As a result, the selection of cases is time limited to the period after the Columbine High School shooting (April 20, 1999). The policy changes enacted in response to the ASE at Virginia Tech provide the second time boundary for this study. The legal changes imposed by the modification to the *Clery Act* by Congress in 2008 vastly changed the policy and preparedness landscape for college campuses. The modification of the law mandated new preparedness activities including publishing plans and the conduct of exercises on all U.S. campuses. This sweeping change presents a tremendous shift in requirements for U.S. colleges and universities. In order to examine events within the same policy context, the selection events is from the period between the Columbine High School ASE and the implementation of the *Clery Act* modifications in 2009 following the Virginia Tech ASE.

Within those time boundaries, eight cases for study remain for potential selection. Table 3.1 details the date, location, numbers of deaths and injuries, and specific campus location of the shooting. This case list originates from the NYPD (2012) report that examines 324 active shooter events since 1966.

Table 3.1

U.S. College Campus Shootings 1999-2009

Date	Campus	Dead	Injured	Location
February 14, 2008	Northern Illinois University: DeKalb, IL	5	21	Classroom
February 8, 2008	Louisiana Technical College: Baton Rouge, LA	2	0	Classroom
September 21, 2007	Delaware State University: Dover, DE	1	1	Outside Dining Hall
April 16, 2007	Virginia Polytechnic Institute: Blacksburg, VA	32	20	Dorm/ Classrooms
May 9, 2003	Case Western Reserve Univ: Cleveland, OH	1	2	Classroom Building
October 29, 2002	University of Arizona: Tucson, AZ	3	0	Office/ Classroom
January 16, 2002	Appalachian State School of Law: Grundy, VA	3	3	Offices / Outside
May 18, 2001	Pacific Lutheran University: Tacoma WA	1	0	Dorm

List derived from: New York City Police Department. (2012). *Active Shooter: Recommendations and Analysis for Risk Mitigation*. New York: NYPD Counterterrorism Bureau.

The selection of cases is crucial for successful case study research. Stake (1994) describes this approach as an instrumental case study. In an instrumental case study "a particular case is examined to provide insight into an issue or refinement of theory . . . . The case is often of secondary interest; it plays a supportive role, facilitating our understanding of something else" (p. 237). Stake (1994) further describes that instrumental case studies come together into the collective case study. According to Hesse-Biber and Leavy (2011) cases are "chosen for the ability to address research questions and purposes" (p. 264). Given unlimited time and resources, studying all eight

events would provide a full range of possibilities. Within the resource limitations of this study, it is impossible to examine all eight events.

The ability to address the research questions guides the selection of cases for study. Each of the incidents has specific and unique characteristics. The nature of ASEs does not provide for the "typical" case. Introducing and explaining each of the potential cases for selection would result in dozens of pages of content. The key characteristics of a case that provides data for analysis are the length of the event in time and the number of affected students and staff. These event characteristics are more likely to result in interaction and organized behavior among survivors. In addition to event chronology, the richness of available data is a key element of case selection. Public information access laws limit the availability of critical data from agency response and investigation of ASEs in some states. Access to and the richness of available raw data influences the selection of cases for study.

The time factor and number of affected students increase the likelihood that the chronology of the event will provide data to address research questions related to social interaction and social organization. Affected students in this sense, does not directly equate to injuries and deaths. For example, the North Illinois University shooting is not a selected case. Despite a large number of injuries and deaths relative to the other cases, the incident was contained to a single classroom and law enforcement officers arrived within a minute of the initial radio call. In addition, the Delaware State University incident occurred outside of a building at 1:00 am. This event involved a small number of people and occurred when many others were asleep. As a result, this incident is not likely to contain data to address research the questions. The Pacific Lutheran University shooting

is also not likely to produce substantive data as the perpetrator randomly killed a professor on a walkway outside a dormitory and immediately turned the weapon on himself (KOMO News, 2001). This incident involved a minimal number of victims and ended quickly. It is unlikely to provide useful data.

The two ASEs from the State of Virginia, while consisting of chronology likely to address research questions, suffer from severe limitations on access to data. The state of Virginia limits access to criminal investigation files. Under Virginia public information laws, access to files is at the discretion of the investigating agency. The Virginia State Police (VSP) is the investigating agency for both the Virginia Tech shooting and the Appalachian School of Law shooting. VSP consistently denies access to information related to ASE events, even for scientific study. Due to a lack of sufficient data theses case are not included for analysis.

The remaining ASEs at the Louisiana Technical College and Case Western Reserve University serve as cases for this study. In both cases, the states in which the events occurred have favorable public information laws for access to data. The researcher received responses to public information inquiries from only the Baton Rouge (LA) Police Department and the Cleveland (OH) Police department. As such, the two cases form the basis of the collective case study. The cases provide an avenue to examine the behavior of survivors in response to the ASE. Complete descriptions of the cases follow in Chapter IV.

Data Sources

Non-reactive measures are research data obtained by means other than direct interview or questionnaire by the researcher (Webb et al., 1966; Webb et al., 1981). Unobtrusive measures for social inquiry assume "that we can learn about our society by investigating the material items produced within it" (Hesse-Biber & Leavy, 2011, p. 227). This approach is consistent with naturalistic theory because it eliminates the reactivity of researchers (Hesse-Biber & Leavy, 2011). Although reduced reactivity is a benefit, this does not mean these material items are both accurate and without bias (Plummer, 2001; Yin, 2009).

This study primarily uses law enforcement investigative materials that include descriptions of actions by responding police officers, audio-recorded interviews with witnesses, written witness statements, 9-1-1 call recordings, recordings of police radio transmissions, and any available surveillance video. Those studies introduced in Chapter II by Johnson (1987), Johnson (1988), Johnston and Johnson (1989), Johnson et al. (1994), Cornwell et al. (2001), Cornwell (2003), and Aguirre et al. (2011), use similar data from law enforcement agencies as primary data. As this study employs a multiple case study approach, the available materials will vary by location based upon many factors. These factors include: (1) differences in state public information laws, (2) variation in law enforcement investigative procedure (3) records retention schedules, and (4) number of survivors and responders involved in the event. In general, law enforcement agencies conduct investigations in similar fashions guided by judicial rules of evidence. Slight variation in procedure may exist.

Due to these factors, each of the cases develops on slightly different data sources. The primary data from law enforcement agencies results from requests for available information under the Freedom of Information Act. In one case, this took months of exhaustive efforts to retrieve information. After receipt and analysis of initial information, the researcher made additional requests for items. Table 3.2 provides a summary of data used in each case. It details the general category of data sources and number of sources. An example of difference is in law enforcement investigative practice is the manner in which detectives collected witness statements. The Baton Rouge Police Department (BRPD) chose to audio record interviews with witnesses (24 total witnesses) and the Cleveland Police Department (CPD) conducted interviews where detectives filed reports on the content of their interviews and collected written statements from witnesses (93 witnesses). Generally, the data is consistent between the two sites other than the availability of police radio recordings from BRPD and the lack of recordings from CPD. As the case studies will show, the scope of the events is different. This results in disparities between the number of involved witnesses and the number of pages of police reports.

Table 3.2

Case Study Data Sources

Data Source	Case Western Reserve University	Louisiana Technical College
Police Reports	356 pages	183 pages
911 Call Recordings	55 minutes 33 seconds of 911 call recordings	12 minutes 21 seconds of 911 call recordings
Witness Statements	103 Witness (both reports by detectives and written statements)	4 hours 03 minutes 19 seconds of recorded witness interviews
Site Observations & Photographs	On-site walkthrough, observations and 24 photos	Onsite walkthrough, observations and 36 photos
Police Radio Recordings	Unavailable	10:12 of radio transmissions
Media Reports	25 media reports	30 media reports

Johnson (1988) provides a succinct statement on the limitations of these materials from his landmark study of the Beverly Hills Supper Club fire. He notes, "investigating detectives were not testing social theories that inform this research; they asked many questions not related to sociological interest, and when they asked questions directly related, they often did not ask them of all respondents" (Johnson, 1988, p. 11). This study benefits from advances in technology that make additional data available to the researcher. Johnson (1987) did not have the availability of 9-1-1 call recordings, recorded witness statements provided within hours of the incident, and radio transmissions to support the development of his landmark work. This research advances the work of Johnson and others with additional data sources available for analysis.

A second source of data is local and national media reports. Killian (2002) warns, "newspaper accounts of disaster are one of the most accessible, but they must be used

with caution…because of the many uncontrolled biases . . . [and] tendencies to over emphasize the dramatic" (p. 81). In addition to routine bias, these are subject to an additional layer, as many of these incidents become the centerpiece for national calls for reform in gun control and mental health policy. Reports are subject to influence from both sides of the debate. Media reports will be subject to rigorous crosschecking described below. The two cases also differ in media interest and depth of materials. In the Louisiana Technical College case, the suspect did not survive. As a result, media coverage was limited to the few days surrounding the incident. In Case Western Reserve University shooting incident, the suspect survived. This resulted in months of media coverage and investigative reporting as there was tremendous national interest in the event, the judicial proceedings, and the bizarre courtroom behavior of the defendant.

The third source is internet and other documentary sources. In some cases, survivors of these events provide information related to their experiences in public venues other than the media. These sources include interviews that may appear in books and/or personal or other websites dedicated to the events. Some survivors decide to self-publish and share their accounts in blogs, recorded public appearances, or on video hosting sites such as YouTube. Evidence provided by survivors located in publically available locations on the internet will also be subject to rigorous cross checking described below.

The researcher used several overlapping methods to identify media and internet sources. Lexis Nexis Academic was the primary tool used for the identification of print and broadcast media information. Search terms for each case included: "Case Western shooting," "CWRU Shooting," "Louisiana Technical College shooting," "LTC shooting,"

and more generally “campus shooting” for the period of six months following the event. The researcher also searched Lexus Nexis Academic for regional areas including Ohio and Louisiana. Traditional internet search engines also provided sources. Media sources do not include blog posts or other items not from print, radio, or television media outlets, unless they were self-published accounts from survivors. The researcher also identified local and regional media outlets in each area and searched available digital archives for sources. The researcher also inquired by email with media outlets whose available archives did extend back to the time of the shootings. Sources that presented reprinted or duplicate information from wire services (such as AP and Reuters) were not included for analysis. This vastly reduced the number of sources to those that provide substantive information pertinent to analysis. In the Louisiana Technical College example, relatively few sources provided additional substantive information. The few sources listed are not due to a lack of research, but the exclusion of many duplicate news items that do not substantively add additional information to the development of the case study or research questions.

The fourth source is site observations. The researcher conducted a site visit, with site approval for access, at each location. The site visit allowed for the review of the chronology of the event and the observation of key incident locations. When possible, the researcher photographed key incident locations. The site visits occurred following the receipt and review of data from law enforcement agencies. The visits allowed to the researcher to observe in order to gain better understanding and validation of the data. Visiting the locations where survivors made decisions for action during the event is instructive. This allows for first-hand examination of the physical structures of the

facilities for an overall understating of the ecological constraints faced by both survivors and responders.

The final source of information is other available digital information and documents related to the site and involved organizations. The researcher used these sources to understand characteristics of the organizations and the context for the event. They are not included as elements in Table 3.2 as an identified data source, as they provide only background and context. These do not provide substantive data to address the research questions.

Essentially, these sources are documentary data sources. In addition to the specific limitations described above, documentary sources have a few general limitations. A document is "any symbolic representation that can be recorded and retrieved for description and analysis" (Altheide, Coyle, DeVriese & Schneider, 2008, p. 127). Documents are "accretion measures" where "the research evidence is some deposit of materials" (Webb et al., 1966, p. 36). Police reports are "archival records," a running account of "data periodically produced for other than scholarly purposes, but which can be exploited by social scientists" (Webb et al., 1966, p. 53).

Several issues arise in using documents as research data. Webb et al. (1966) identify that documents and other unobtrusive measures are "attractive if one wants to compensate for the reactivity which riddles the interview and the questionnaire" (p. 53). The benefit of non-reactivity does not always outweigh the other issues that come with the use of document-based data. These issues include scientific value, potential bias, accuracy, and problems in the interpretation of context. In the case of this research, the

documents both eliminate reactivity and decrease other potential errors, including reconstruction errors, memory decay, and enhancement.

Blumer (1979) describes the "problem of documentary materials that do not meet the rigid application of scientific canons" (p. 36). He outlines four test considerations for documentary data. These include (1) representativeness of the data, (2) adequacy of the data, (3) reliability of the data, and (4) validity of the interpretation of data (Blumer, 1979). Representativeness refers to the method of document selection in relation to the full spectrum of available documents to inform the research question. Adequacy refers the background of the documents. This includes chronology, position of the author, and other factors in relation to the ability to inform the research question. Reliability is the "honesty or truthfulness of the account" (Blumer, 1979, p. 36). Finally, the validity of the interpretation of the data refers to the conclusions reached by the researcher based upon the data. This element is subjective; Blumer (1979) identifies an absence of "rules which would permit determination as to whether the interpretation is correct or erroneous or the extent to which it is so" (p. 36-37). The primary data source is police reports. As these documents must withstand legal scrutiny in the prosecution of crimes, they are representative, adequate, and reliable.

The second issue in using documents as a data source is the potential for bias. The issue of reliability is closely associated. Plummer (2001) warns that "official records are often unreliable" and cautions about the "politics of perspective" consistent with critical and feminist approaches to research in that these records may not reflect underrepresented group perspectives (p. 158). This also links to theory concerning the search for an objective reality or the view that reality is subjective and thus defined by the

author of the document (Plummer, 2001). Hodder (1994) also describes another avenue of potential bias, arguing, "the writing down of words often allows language and meanings to be controlled more effectively, and to be linked to strategies of centralization and codification" (p. 394). The use of all available documentary data from multiple sources controls for bias. Sources are not subject to exclusion unless issues arise in the crosschecking process.

Accuracy is the third issue for documents as a data source. In addition to the criteria and actions discussed in the scientific issues above, Scanlon (2002) adds several questions designed to test the validity of personal stories. Scanlon (2002) asks researchers to add the following questions: "(1) Does the material have internal consistency? (2) Is there any corroboration? (3) Is the account something that reasonably could have been known to the person who created the record? and (4) when reading a written account, "How would the person have known that?" (p. 297). Yin (2009) cautions against viewing official documents as the "unmitigated truth."(105). He states that it is "important in reviewing any document to understand it was written for some specific purpose and some specific audience other than those of the case study to be done" (Yin, 2009, p. 105). Obtaining data from multiple sources and crosschecking allows for the establishment of accuracy.

The interpretation of context is the final issue for documents as a data source. The researcher who uses documents is often disconnected in time and space from the author who wrote them. As a result, Hodder (1994) describes the solution, stating, "material traces thus often have to be interpreted without the benefit of indigenous commentary" (p. 393). The problem of interpretation for researchers then becomes explaining the

contextual elements that led to the creation and the meaning behind the document. This results in the potential for multiple interpretations. Hodder (1994) writes, "as text is reread in different contexts it is given new meanings, often contradictory and always socially embedded" (p. 394). As described by Blumer (1979), no objective standards exist for evaluating interpretation. The events in this case are recent and occur in the current social, political, and historical context. As such, the interpretation of context is not problematic for this data.

In light of these general and specific limitations, the data is subject to crosschecks with other identified sources prior to analysis. Law enforcement data serves as the primary source for comparison. Aguirre et al. (2011) outline a similar process. Aguirre et al. (2011) explain that, "multiple organizations collected the information for their own different purposes…allowed us to contrast, verify, and correct when necessary the information we ended up using, adding to its validity" (p. 103). Media and internet sources are subject to the validation test outlined by Scanlon (2002) and crosschecked against law enforcement investigative sources. The analysis excludes sources that cannot pass validation. Phillips (2002) advises that documents "can be used creatively as the sole data sources or as part of a triangulated strategy" (p. 206). In this study, documentary data from multiple sources (establishing data triangulation) is subject to crosschecks for accuracy before analysis. These procedures ensure that data is representative, adequate, and reliable, without bias and understood within its context prior to analysis.

Data Analysis Procedures

Grounded theory differs from other methodologies in its emphasis on coupling data collection, analysis, and additional sampling for theory development. Theory results from an analytical process that may or may not proceed sequentially. Data analysis in grounded theory generally moves between the data, analysis (coding, memoing, and diagraming), use of additional literature sources, and finally interpretation and the production of theory. The following paragraphs examine this process and its use in this study.

The previous section discusses the sources of data for this study. A preliminary step in analysis is the preparation of data for analysis (Hesse-Biber & Leavy, 2011). Data preparation with mostly documentary sources and electronic analysis tools includes digitizing data in paper form. It also includes transcription of some recordings of 9-1-1, radio transmissions and other audio and video sources. This study uses QSR international NVIVO (version 10) analytical software, which allows for the transcription and/or direct coding of audio and video sources (Bazeley & Jackson, 2013). Discussion of the specific use of NVIVO 10 software for analysis follows.

Following data preparation is analysis. Generally, it consists of the steps of data exploration and data reduction (Hesse-Biber& Leavy, 2011). Data exploration generally consists of reading and/or listening to or viewing the data and beginning the thought process by highlighting important elements as an initial review (Hesse-Biber & Leavy, 2011). In this step, coding data begins. Corbin and Strauss (2008) describe coding as:

> more than just paraphrasing…more than noting concepts in the margins…it involves interacting with the data (analysis) using techniques

> such as asking questions about the data, making comparisons between data…in doing so, deriving concepts to stand for those data, then developing those concepts in terms of their properties and dimensions (p. 66).

In grounded theory, coding can be open, axial, or selective. Corbin and Strauss' (2008) description illustrates the three coding types. The process begins with open coding. Open coding is "breaking data apart and delineating concepts to stand for blocks of data" and "qualifying those concepts in terms of their properties and dimensions" (Corbin & Strauss, 2008, p. 195). Axial coding is "the act of relating concepts to each other" forming categories (Corbin & Strauss, 2008, p. 198). Selective coding is "the process of integrating and refining categories" (Strauss & Corbin, 1998, p. 143). The integration of categories into a larger theoretical scheme results in the research findings generating theory (Strauss & Corbin, 1998). In this study, analysis begins with the use of a semi-structured coding scheme as a basic framework. Bogdan and Biklen (1998) provide a framework of ten basic codes as a starting point for analysis. The researcher uses this framework as a starting point, but its implementation is flexible to capture emergent elements in the same manner as open coding. Figure 3.1 shows coding example from the research data for this study. Analysis continues with axial coding, linking the identified concepts in open coding to one another to form categories. Finally, selective coding leads to the integration of categories and the production of theory.

CODE: DEFINITION OF THE SITUATION

"…(Female Professor)…said that before 1600 hours heard what we thought was scaffolding falling, then other sounds on the third floor" (CLEVELAND PD REPORT).

"He thought that they were tables falling over, then saw two people running." (CLEVELAND PD REPORT)

CODE: INITIAL ACTIONS

Dispatcher: "Was anybody hit?" CALLER:"I don't know we locked the room and turned the light off" (BATON ROUGE PD 9-1-1 Call)

"She advised she heard another loud noise and then got on the floor" (BATON ROUGE PD REPORT)

Figure 3.1. Data coding example. Shows coding example from Baton Rouge and Cleveland Police Department data sources.

The analytical process uses memos and diagrams as tools to take the thought process to a higher-level as codes emerge into categories. Memos are "theoretical notes about the data and the conceptual connections between categories" (Holton, 2007, p. 281). Memos capture elements for further analysis and then continue higher-level analysis to develop theory. Generally, grounded theory uses three types of memos. Memos can be descriptive (summarizing data), analytical (analysis of data), or theoretical (writing theory) (Hesse-Biber & Leavy, 2011). A second analytical tool is the diagram. Lempert (2007) argues that "diagrams and memos are conjoined; both are necessary and simultaneous to the research process" (p. 254). Memo writing and diagram development occur throughout the analytical process and forms the link between analysis and the final stage of interpretation (Hesse-Biber & Leavy, 2011). This study uses both memos and diagrams to further analysis. Memos further conceptual analysis and diagrams develop sequential process elements and activities in reaction to ASEs.

The use of additional literature sources is a subject of debate within the grounded theory approach. Corbin and Strauss (2008) describe the potential problem for analysis

because “the researcher does not want to be so steeped in the literature that he or she is constrained, even stifled by it” (p. 36). The literature has utility for the examination of emerging issues. Lempert (2007) writes that the utility of, “comparisons from the literature alerts me to gaps in theorizing, as well as the ways in which my data tells a different, or more nuanced story…it does not however define my research” (p. 254). In this study, existing literature assists in sharpening the analysis and refinement of concepts. Existing theories and concepts from the literature provide a point of comparison as the interpretations emerge from the data. The existing literature is complementary to the process and not a driving force behind analysis. The analysis remains seated within the data consistent with the grounded theory approach.

The final step is interpretation. Strauss and Corbin (1994) explain that “interpretations are sought for understanding the actions of individual or collective actors being studied” (p. 274). Essentially, what occurs in the description above is the constant comparative method. Glaser (1965) outlines the constant comparative method in four steps: “(1) comparing incidents applicable to each category, (2) integrating categories and their properties, (3) delimiting the theory, and (4) writing the theory” (p. 439). This occurs through the outlined coding, analysis, memoing, and diagraming process. The analysis continues until reaching saturation. According to Glaser and Strauss (1967), analysis reaches saturation:

> After an analyst has coded the incidents for the same category a number of times, he learns to see quickly whether or not the next applicable incident points to a new aspect. If yes, then the incident is coded and compared. If

> no, the incident is not coded, since it only adds bulk to the coded data and nothing to the theory. (p. 111)

Eisenhardt and Graebner (2007) describe theory development in collective case studies. Theory is "emergent in the sense that it is situated in and developed by recognizing patterns of relationships among constructs within and across cases and their underlying logical arguments" (p. 25). This study uses the constant comparative method to develop interpretations. This method informs the development of memos and diagrams that lead to interpretation and theory development.

Qualitative Analysis Software

This study uses the computer-aided qualitative analysis software NVIVO (version 10 - QSR International). Use of software for analysis has become nearly universal and recommended for qualitative research (Hesse-Biber & Leavy, 2011). Most basic texts include references to or specifically integrate examples from qualitative software packages. For example, Hesse-Biber and Leavy (2011) discuss a range of software options while Strauss and Corbin (2008) develop their text with assistive screenshots of the MAXQDA software. Many qualitative researcher use NVIVO. This research uses Bazeley and Jackson's (2013) *Qualitative Data Analysis with NVIVO* for reference and guidance in application of the software throughout the analytical process. This research uses NVIVO to store digital data, link internet sources, and import audio files for total project data storage. Coding and memoing functions of NVIVO serve to develop and refine codes. It allows linkage through diagrams, and the development of categories leading to theory.

Trustworthiness of the Research

Lincoln and Guba (1985) outline criteria for establishing trustworthiness in qualitative research. The elements involved in establishing trustworthiness include (1) credibility (2) transferability (3) dependability, and (4) confirmability. The following paragraphs review these elements and the techniques used by the researcher to establish the trustworthiness of this study.

Credibility is the overall confidence in research findings. The researcher uses several techniques to enhance the credibility of the study. Documentary data serves as the sole source of evidence for this project. The analysis uses three separate document types with different creators and purposes, subject to crosschecking for validation. The multiple documentary data sources, from different origins (9-1-1 calls and recorded statements directly from survivors, radio dispatch recordings from responders, reports from law enforcement agencies, media reports, site observations, and internet sources), establishes method triangulation (Denzin, 1978). In addition, the researcher applies established techniques for data analysis (grounded theory - constant comparative method), using similar, but more robust data in a manner employed previously by other researchers (Johnson, 1987a; Johnson, 1988; Johnson & Johnson, 1989; Aguirre et al, 2011). The author also tests rival explanations and uses negative cases to enhance analysis. In addition, the study uses referential adequacy to check the credibility of research findings. The researcher set aside a portion of witness data for later review. For the Louisiana Technical College event, 4 out of 23 witness recordings, transcripts and associated narrative police reports about witness interviews were set-aside for later analysis. For the Case Western Reserve University event, reports and statements from nineteen witnesses

were set aside for later review. The review of set-aside witness materials confirms the findings from the larger data. Moreover, the researcher has previous research and publication using similar methods and NVIVO software for data analysis.

Transferability refers to the applicability of the research to other events or contexts. Lincoln and Guba (1985) identify thick descriptions as a technique to ensure transferability. Generally, this develops through interviews, observations through prolonged engagement with informants, and the research location. The retrospective nature of the study, with some events occurring as many as ten years prior, limits options for sources of data and the ability for engagement. As such, the researcher conducted preliminary review and analysis of available data before site visits. Site visits allow the researcher to validate data and review the chronology of the event on-site. In addition, as described previously, this research is limited by the traumatic nature of the event, methodological issues exposed in previous research on similar events (Newman et al., 2004), and research resource limitations. This research uses multiple sources of data to provide understanding of the events. In addition, the professional background of the researcher as a career law enforcement officer with experiences as a trainer and responder to a shooting at an educational institution provides understanding to incidents as they develop.

Dependability refers to the ability to replicate the process and findings of a study. Lincoln and Guba (1985) identify external audits as a technique to address dependability. To establish dependability, an outside researcher conducted an external audit of the process and product of this research.

Confirmability is the neutrality of the researcher in the conduct of the study. It ensures that no bias went into the conduct of research or development of findings. The researcher uses an audit trail to ensure confirmability. In addition, the researcher identifies his fourteen years of law enforcement experience including credentials as a trainer for the response to active shooter events, and experience as a responder to an actual shooting on a school campus. The researcher's involvement in the field does not bias the analysis or findings, but provides additional depth of understanding to the role of law enforcement officers in active shooter events.

Ethical Issues

This study has approval of the Oklahoma State Institutional Review Board. Appendix A contains the approval documentation. This study does not list the names of survivors or law enforcement officers in the report of findings. A reference to individuals is generally by category of affiliation and or background, such as student, professor, etc. Despite this safeguard, it may be possible to identify survivors based upon public reporting, statement and interviews provided by survivors, and the fact that media reporting is one source of data for this study. The retention of data collected is for a period of three years following the conclusion of the study.

CHAPTER IV

ACTIVE SHOOTER EVENT CASE STUDIES

This chapter presents the case studies of active shooter events (ASEs) on college campuses, specifically, the May 9, 2003 ASE at Case Western Reserve University in Cleveland OH and the February 8, 2008 ASE at Louisiana Technical College in Baton Rouge, LA. The case studies provide a mechanism to examine survivor behavior in response to the ASEs. Each case study uses the framework provided the C-Model (introduced in Chapter II: Table 2.1) for organization and presentation. Using the model, each case develops by examining the characteristics, chronology, conditions, and consequences of the event.

The case presentation begins with the characteristics of the event location. The description of characteristics section includes a synopsis of the background information of the campus, victims and survivors, and the description of the physical environment where the event takes place. Again, this study focuses on the behavior of survivors. As a result, the background, motivation, preparation and actions of the perpetrator, other than during the timeframe of the active event are irrelevant. The chronology section establishes the timeline of the event and the actions of survivors, perpetrators, responders,

and organizations as the event unfolds. The conditions section examines the core independent variables related to survivor behavior. These are the central elements of the survivor behavior focused research questions. Finally, the consequences section examines the outcomes of the event. In addition to overall event outcomes, the examination focuses down to the results of protective behavior choices.

The research questions and propositions from the literature for this study are:

1. What are the processes involved in collectively defining the socio-behavioral response to ASEs?

   Propositions from the literature:

   P.1.1. The response is social rather than asocial with an absence or isolated incidence of panic behavior.

   P.1.2. The response includes helping behavior among survivors

2. How do social interactions and social organization emerge among survivors in a campus ASE?

   Propositions from the literature:

   P.2.1. The survivors response includes information seeking behavior to interpret environmental cues and warning information through interactions with others present and those in other social networks.

   P.2.2. The survivors socially organize to deal with a new problem and decide on protective behavior implementation.

P.2.3. The survivors show maintenance and extension of social roles.

3. What type of protective behaviors do survivors of campus ASE exhibit?

   Proposition from the literature:

   P.3.1. The survivors exhibit a range of behaviors appropriate to the situation to include evacuation, shelter, and information seeking behavior.

4. How do decisions for protective behavior arise among survivors in ASE?

   Propositions from the literature:

   P.4.1. The survivors show interaction for social confirmation of environmental cues.

   P.4.2. The social interaction between survivors leads to decisions and division of labor for implementation of protective behaviors.

The case description developed through the framework of the C-model elements allows for both the examination of research questions and presentation of emergent elements from the data. The framework allows the researcher to create a detailed narrative of events, the analysis of which leads to the development of a fresh theoretical perspective. The presentation of case studies begins with the examination of the ASE at Case Western Reserve University and concludes with the ASE at Louisiana Technical College. This chapter presents observations and findings within each case. Chapter V presents the cross-case analysis and findings.

Case Study 1: Case Western Reserve University Shooting: May 9, 2003

The following sections detail the C-model elements for the ASE on the campus of Case Western Reserve University on May 9, 2003. Examination of the data, described in Table 3.2 (Chapter III), revealed 103 individuals who fit the study definition of a *survivor*. The experience of the survivors, as captured in the data, provides the basis for understanding human behavior in response to ASE within the context of this case. The case study presentation begins with examination of the characteristics. The characteristics section of the study includes brief overviews of the organizations involved in the initial response to the incident: Case Western Reserve University, University Circle Police Department and city of Cleveland Department of Public Safety agencies Police, Fire and Emergency Medical Service. As the incident developed, additional law enforcement mutual aid resources including the Cuyahoga County Sheriff's Office Special Weapons And Tactics (SWAT) team, Euclid Police SWAT, and Federal Bureau of Investigation (FBI) SWAT responded to the incident. The characteristics section does not examine mutual aid elements as separate organizations. The second section presents the chronology of the event, providing a narrative description of how the event proceeded over time. The description of the event uses the trace-forward technique beginning with the first shots fired. As key elements unfold in the description, the explanation infuses related conditions, additional specific characteristics, and consequences. The final section examines overall event consequences, to include the outcomes and resultant change.

Characteristics

Organizations.

Case Western Reserve University (CWRU) is a private, non-profit, four-year institution of higher education. CWRU offers Bachelor's degrees, Post baccalaureate certificates, Master's degrees, Doctoral degrees (PhD), and Doctor's degrees (MD - professional practice). In the 2002-2003 academic year, CRWU had a total enrollment of 9,097 students (3,457 undergraduate, 2,169 graduate, 3,471 professional). Precise historical data related to faculty employment during the 2002-2003 year is not available. Data for the 2007-2008 academic year indicate 1,264 CWRUfaculty. Available 2012-2013 data also shows 2,963 paid staff and 4,356 (faculty and staff) total employees. In 2002-2003 academic year, the CWRU employed unarmed security officers. The University did not employ armed uniformed police officers capable of armed emergency response.

The 550-acre university campus of more than 120 buildings is geographically located in the eastern portion of the city of Cleveland, OH. In 2003, CWRU received law enforcement services from both the University Circle Police Department and the city of Cleveland Police Department. The University Circle Police Department is a small department of 25 officers that services a one square mile area that includes parts of the CWRU campus. The CPD consists of over 1,600 police officers (1,560- 2004 Law Enforcement Census) and is one of the fifty largest police departments in the United States. As such, CPD has a range of available specialized resources to support full spectrum emergency incident response and investigation. CRWU is geographically

located in the CPD Third District. The Cleveland Division of Fire (CDF) and Cleveland Division of EMS (CEMS) provide emergency medical and fire services to the campus. Cleveland Fire Station #10 is located less than one mile from CWRU. The campus is also located in close proximity to East Cleveland and Cleveland Heights Fire Department stations. The CEMS consists of over 200 EMS providers working 15 Advanced Life Support (ALS) ambulances. CEMS provides pre-hospital emergency care within the city of Cleveland.

Peter B. Lewis building - CWRU.

The shooting took place within the Peter B. Lewis (PBL) building on the campus of CWRU. The PBL building is a non-conventional modern architecture building located at the intersection of Bellflower and Ford Roads on the CWRU main campus. The building is home to the Weatherhead School of Management and other campus programs and offices. Renowned architect Frank O. Gehry designed the building. Gehry designs incorporate curves and rounded shapes that appear as waves. As a result, both the interior and the exterior of the building are shaped or accented with curves, resulting in few if any right angles. Traditional building design for institutional structures usually includes square corners and open spaces minimally opening to a second floor or atrium. The PBL design is very different, incorporating open spaces spanning several floors with window, walkway, and balcony overlooks that allow for observation of the central area of the building from dozens of locations. The building also includes curved interior walls with many at non-traditional vertical angles.

The first floor of the PBL building contains a cafeteria and administrative offices. Figure 4.1 shows the floor plan of the first floor of the building. As the incident took place throughout the building, the first floor serves as an example of the unique features of the interior floor plan. Due to the complexity of the incident, a map is unable to display the full details of the incident across the several floors of the building. The floor plan does show many of the non-traditional features of the building. The second through fifth floors consist of classrooms and administrative offices and contain similar non-traditional characteristics. Many of the classrooms are theater style rooms with center stairs between the two halves of the room. Many have small projection A/V rooms behind the presentation area at the front of the room. The basement contains computer labs, administrative offices, and classrooms.

Figure 4.1. Peter B. Lewis Building First Floor Map. The map illustrates the unique interior architectural characteristics of the building.

Chronology: Initial Minutes of the Incident

The shooting at the CWRU PBL building start just prior to the first 9-1-1 call received by Cleveland Police Department (CPD) dispatch at 1557 hours on Friday May 9, 2003. At the time of the shooting, the final exam period ha already concluded, leaving few students on campus and in the PBL building. It a Friday afternoon, nearing the closure time for many campus offices. The shooter approaches the northwest entrance of the building wearing an army style helmet, tactical vest (flak jacket) that includes body armor and a black backpack. He uses a mallet from his backpack to break the glass in an

entrance door to gain entry to the building. Once in the building, the shooter removes a 9mm Cobray semi-automatic pistol from the backpack and moves toward the central area of the building.

The only fatality during the incident occurs with the first gunshots. A student, who was talking with a small group of other students outside the café, moves toward the shooter. The shooter fires at the student at close range striking him in the chest. With the initial shots, students and staff begin to react to the incident.

Conditions: Definition of the situation in the initial seconds.

Students and staff based on the first floor of the building are the first to recognize the event as a shooting and are therefore the first to react. They u direct audio and visual observation of the shooting. One student recalls the initial moments of the shooting:

> A few seconds after (student name) walked away from us, I heard a loud bang. I then saw (student name) running back in front of us. Then I did not see (student name), and I think he collapsed…the male fired one time at us, then (student name) and I fell to the floor (Cleveland Police Department [CPD] Report, 2003).

Students continue to react as the shooter targets them, relying on both audio and visual cues. The primary importance of such cues cannot be overstated. For example, a student who had entered the building after the initial shots and therefore did not hear them, walks directly toward and within a few feet of the shooter. Without direct audio and visual cues, the student does not realize what has happened and only runs when the gunman points his weapon at him. The weapon fails to fire and the shooter cycles the bolt of the weapon,

apparently to clear a misfired or jammed round. Another student just entering the building quickly recognizes the danger and runs.

The survivors in the first floor area who do not have direct visual observation of the initial incident respond to audio environmental cues with a secondary action to gather additional information. One states: "I heard a loud bang sound. I proceeded to the front door of the cafeteria, and I witnessed (student name) falling to the floor that's when I heard two more bang sounds" (CPD Report, 2003). Another survivor recalls:

> I heard a loud bang from behind me. So, I turned to look what the noise was and I saw a man about 20 feet away from me falling forward and he seemed to be holding his stomach. I looked behind him and about 20-30 feet behind the guy lying on the floor was another man and I saw he was holding a gun…I got scared and (staff name) was starting to run towards the main entrance and I took off behind him (CPD Report, 2003).

In the absence of direct visual observation of the shooter, survivors rely on audio environmental cues in order to gather the information necessary to ffect action. Two of the most prominent and consistent secondary actions include recognizing the abnormality of the loud, bang noises and identifying the potential meaning of other students falling around them. Others on the first floor follow the pattern, with some keying on additional environments (audio and visual cues) and others on the social observations of the behavior of others to define the situation.

Conditions: Direct contact protective actions.

Students and staff in direct contact with the shooter protective actions once they recognize the incident as a dangerous and problematic situation. One survivor describes his/her actions:

> Then immediately (student name) and I took the table we had and flipped it forward. We kind of backed it up towards the wall to provide protection for the both of us. We realized the gunman was right in front of us, and we flipped the table vertically to better protect us and backed toward the wall again…(student name) ran out the out along the edge of the wall and started heading down the stairs. He was using the half-wall to protect him. I stayed under the table for what seemed 10 to 15 seconds more. I followed along the same way and headed down the same stairs (CPD Report, 2003).

Another seeks help, remembering that: "At this time I was already on the floor, so I just crawled to the phone located to behind the counter in the Café. I called 911, and while the phone was ringing, I heard another bang, and that's when I dropped the phone, and proceeded to run out of the building" (CPD Report, 2003). Yet another survivor recalls how environmental cues and social observations directed protective actions: "I got scared and (staff name) was starting to run towards the main entrance and I took off behind him" (CPD Report, 2003). Protective actions develop in concert with environmental options. Those in the shooter's immediate area, relying on direct audio and visual cues, take protective actions according to their availability. These range from dropping to the floor

and barricading themselves from the shooter, using ordinary environmental items like tables, to ducking and running for shelter, again using whatever was available in the environment to increase their protection as they ran to evacuate the building.

Chronology: Shooter Moves to the Basement

Before the arrival of the officers, the shooter moves to the basement of the building. Students and staff in the basement begin to react to the noise from the first floor. Two of the students from the first floor, who initially took cover behind a table, flee to the basement before the shooter moves there. Another student who was ascending the stairs from the basement heard the noise and saw the "sparks" from the gunfire also flees back to the basement.

Conditions: Proximity and definition of the situation.

Survivors in the basement who heard the noise initially misdiagnose the shots as other potential issues. One survivor describes the confusion: "He was in the basement when he heard shots. He thought that they were tables falling over, then he saw two people running and both looked terrified" (CPD Report, 2003). Another survivor: "She heard what sounded like a table being dropped. She then heard three more loud sounds" (CPD Report, 2003). Loud noises the first environmental cue with which the survivors work, and they consistently misidentify them in the moment. It is not until survivors pick up on either the social behaviors of others or the continuation of the loud noises that they recognize the noise as gunshots and not tables falling.

With environmental cues of the loud noise, survivors begin to gather information through movement. They move to gather additional environmental information by

interacting socially or milling with other survivors. Information and observations before the arrival of the shooter lead to protective active decisions that escalate with the arrival of the shooter. Information that informs protective action decisions include direct interaction (milling), additional environmental cues, and social observations of the behavior of others. Survivors describe the ways they gathered information. One says: "I saw a number of students in the Audio Visual room. I knocked on the window, and they let me in the door. I told them what was happening. We switched off the lights and hid behind computer servers for five hours" (CPD Report, 2003). An interview with the CPD reveals another survivor's accounting:

> At this time, he along with (3) other males went to investigate. They walked up the stairs to the first landing, and they heard another gun shot. At that time from where he was standing he observed a male with what appeared to be a green helmet on his head on the main level…At this time they ran down stairs, and back into the room where he and the others work (CPD Report, 2003).

The police record yet another survivor's description, yielding additional information: "(Survivor name) said (employee survivor #1) and (employee survivor #2) went out to check. She said that they and another male came running past them fast. (Survivor name) said she believed that something was wrong because of how fast they were running" (CPD Report, 2003).

Survivors fleeing from the first floor warn others in the basement, either directly through verbal contact or by the keynoting of their actions that others observed. These

observations combined with the previous audio environmental cues lead to action for many. For others, the shooter arrives before they can define the situation as requiring protective action.

Conditions: Protective actions – Shooter moves to the basement.

For many, the environmental cues, social cues, and social interaction lead to protective action before the arrival of the shooter. Police record one survivor's recollection: "He was in the basement when he heard shots. He started to run up the stairway half way when someone above him said someone is shooting, so he went back downstairs and into the Video Visual room and locked himself in" (CPD Report, 2003). A different survivor tells police that, "Another employee then told everyone in the room to go to the server room, that someone was shooting a gun" (CPD Report, 2003). Both the sound of gunshots and word of mouth lead some survivors to take immediate protective action, running to avoid the oncoming shooter and locking themselves in rooms to keep the shooter at a distance. For those who do not take action on the basis of environmental cues, social observations, and social interactions, the arrival of the shooter in the basement provides additional immediate cues, as police record one survivor's experience:

> One of his co-workers came in to the computer lab, said she did not like the sound of the banging, and said it sounded suspicious, like gunfire. (name) decided to call security…He went out in the hallway to see if he could see anything. He was conferring with co-workers (name #1) and (name #2)…he saw a figure standing in the hallway…the male started to

> raise the gun…they ran through the computer lab as shots were fired. (name #1) had his swipe card ready to use…they entered the room and shut the door…they scrambled for cover as he shot through the wall (CPD Report, 2003).

The loud noises only raise suspicion for the survivors above. Upon further investigation, during which time the survivor utilizes milling, the shooter arrives, clarifying the situation and forcing the survivors to take protective actions. Students and staff prior to and during the shooter's arrival hide and/or flee to areas behind locked doors. The shooter fires shots, but does not hit any of the survivors in the basement. The shooter proceeds back to the main floor after attempting to make entry into locked spaces occupied by survivors.

Chronology: Initial Responders Arrive

CPD dispatch reports show the first units arriving at 1602 hours. The first police officers to arrive on the scene are from the University Circle Police Department (UCPD). The two officers, traveling together, immediately make entry into the first floor of the building. They report noticing the victim on the floor before the gunman begins firing at them. The officers exchange gunfire with the suspect using issued handguns and a 12-gauge shotgun. The volume of fire from the suspect forces officers to a small entryway near the doors. Due to the volume of gunfire and poor cover position, the officers back out of the building and radio for assistance.

Chronology: Initial CWRU Response

An unarmed CWRU security officer is making rounds of the campus on foot near the PBL building when he hears noises and sees survivors fleeing the building. The officer relays observations and remains in the area, providing access cards and keys to police. Within the building, information spreads among survivors and an email comes from the administrative offices of the Dean located on the first floor. The Dean's Office sends the email to the PBL building staff just as police arrive at 1603 hours. The email notifies the employees that there is a shooter in the building. It also instructs them to lock doors and remain in their offices.

Conditions: Proximity and definition of the situation – Beyond the basement.

Students and staff on the remaining floors of the building who heard the noise from the first shots also initially misdiagnose the shots as other potential issues. A survivor on the second floor tells police: "Sometime before 4 PM I heard a noise that sounded like books being dropped or a table falling. I remember thinking at the time that if I lived in a more dangerous environment, I would be worried about that noise" (CPD Report, 2003). This survivor's past experiences directly impacts his/her ability to identify the sound as gunshots.

Many who hear the initial shots take action to gather additional information to determine the source of the noise. One survivor describes his/her actions:

> I was in my office which is (second floor room #), when I heard the shots ring out. It sounded like they came from the Atrium because of the way they reverberated through the building. They sounded like gunshots, but I

> could not believe I was hearing that. I thought I had better look into this. I looked out the window…I saw a police car heading toward the Lewis building on the sidewalk. There were emergency vehicles on Ford Road (CPD Report, 2003).

Most of the survivors interact with others in their area, gathering information about the nature of the noise. This information gathering includes moving to other areas to make additional visual observations. Others observe keynoting behavior of survivors in response to additional social and environmental cues. One survivor describes such behavior:

> I heard the gunshots and just thought they were general noise. Then (staff name) came in and said you could see someone lying on the ground. We ran to her office. I could see the lower half of someone on the ground...while we were looking we saw the gunman walking in the direction of us, about the time when he got parallel to the body on the floor we realized it was the gunman…we went in office (number) with (staff name). We turned off the lights and sat on the floor until SWAT came (CPRD Report, 2003).

Police reports consider another survivor's actions: "She went to the interior hallway of her office, and observed everyone running into the office saying to get in the room and lock the door. At this time everyone went into different rooms" (CPD Report, 2003). Police report on yet another interviewee:

> (Name) reports being in a co-worker (name) office when she heard a loud bang sound. She thought it was a table falling to the floor, and didn't pay much attention. Moments later a female (name) name ran through the hallway and said there was a male with a gun. She then observed a male and a female running towards the back door of the office (CPD Report, 2003).

The sound of gunshots, either identified as such or misidentified, prompts survivors to act in order to gather more information. They begin moving around their immediate areas to determine what is happening, and they pool information with other survivors they encounter. With enough information, survivors act, locking themselves in rooms or running from the shooter.

In addition to environmental cues, face-to-face social interaction, and social observation, many also see an email sent by the Dean's Office. This interaction from an institutional entity also serves as a key confirming source for staff. One account explains, "(Survivor) reports an E-MAIL came over informing individuals to 'GET IN OFFICE...GUNFIRE.' He stated he went directly to his office and locked the door" (CPD Report, 2003). For those not in an area where direct visual or audio clues could be used to affect protective behavior, survivors rely on the authority of the Dean's Office.

Conditions: Proximity and protective actions – Beyond the first floor and basement.

As occur on the main floor and in the basement, survivors identify the situation as problematic and take action individually or collectively to protect themselves from the

hazard. Several previously described survivor experiences present such protective actions. As the survivor descriptions indicate, defining the situation as problematic quickly lead to the implementation of protective action. Police record one survivor's experience:

> He stated he was on the second floor and was walking towards the Map Room when he heard gunshots and looked across the window and saw a male firing a gun towards the front of the building. He could not make him out very well, but believed he had a green jacket on, some kind of hat and was not very tall. He said he ran down the hall yelling someone is shooting and ran to (room #) where they locked themselves in (CPD Report, 2003).

Once this survivor realizes a shooter is in the vicinity, he/she runs away, alerts others, and hides behind a locked door, thereby protecting him/herself and others. Those further away from the initial hazard engage in social interaction and discussion to confirm the hazard and define the situation as one requiring protective actions. Survivors also engage in milling to determine initial protective actions and re-evaluate those actions. A call to 9-1-1 from a survivor illustrates such actions:

> DISPATCHER: We don't know how many people were shooting we don't know if we have all of them, so if you guys figure out a safer room that you can go to call us back. To let us know where you are at.
>
> CALLER: Okay, I will relay the information. Wait a minute, let me ask…(voices in the background) (to others) Do you want to go next door?

It's safer; it's bigger; we can get away from the glass door (voices in the background).

DISPATCHER: Okay, there is no glass door on that room?

CALLER: There is, but we can get further away from it, right now we are in a little room that no matter what happens with this glass door someone is going to…get hurt.

CALLER: It is right next door

DISPATCHER: okay, I want to stay on the phone while you transfer over there…

CALLER: Okay we are going to send someone out to unlock the doors…(talking in background) be careful…he is going to… so he can unlock the door…All right…we are going now…

CALLER: and we are all in and the door is shut… (CPD 9-1-1 Recording, 2003)

Survivors group together, relay information to the appropriate authorities, and attempt to protect themselves in the best way possible, going so far as to transfer rooms once they identify a potential hazard in the first shelter. Survivors constantly evaluate and reevaluate their actions, altering course as necessary. Protective action taken by survivors outside of the basement and the first floor include hiding, moving to sheltered areas, and locking doors. Survivors also continue to gather information to reassess protective behavior choices.

Conditions: Division of labor.

A number of experiences described thus far in this case illustrate division of labor among survivors in information gathering. The previous 9-1-1 call, for instance, illustrates division of labor in information and protective actions. The description shows how one survivor maintains communication with 9-1-1 while another goes out first to unlock a door and the others follow. Survivors report to police similar examples of division of labor in information and protective actions. For example:

> She heard what sounded like something dropping. (Name #1) went out in the hall, and returned a few minutes later, saying someone was in the building shooting. (Name #2) said she went to the front door and locked it, and (name #3) locked the back door (CPD Report, 2003).

Police report regarding another survivor: "While attempting to get through to the 9-1-1 operator, someone in the office yelled they got through, and she hung up the phone" (CPD Report, 2003). The responses of survivors to the incident reveal a division of labor in addressing information gaps and implementing protective actions.

Conditions: Role enactment/extension.

A number of the preceding examples also show evidence of role enactment and role extension. The roles present in the event are as an employee/ professor, co-worker, and student. The data do not show any other identifiable relationships with consequence for the description. The strength of relationships between co-workers cannot be determined.

Although not many students are in the building because classes have ended, faculty and staff take responsibility for the students who remain. This action shows both maintenance and extension of the professor-student relationship, even though classes where a professor would have responsibilities in an emergency are not in session. Police report one student survivor's accounting: "A female professor came to the room he was in, and he followed her to a 5th floor room where they locked themselves in until the police came" (CPD Report, 2003). Despite the fact that classes are not in session, the female professor seeks out the male student to ensure his safety, demonstrating one of the myriad ways professors and other employees extend their roles to help students.

Other employees maintain and extend roles during the emergency to warn others and engage protective behaviors that help others find safety. Perhaps most importantly, employees in the Dean's Office located on the first floor send an email message to staff in the building during the shooting to confirm the incident and instruct them to take protective actions. Another employee with responsibilities for the facilities extends his role to warn employees and to provide additional information to responders while putting himself at risk. A segment of his conversation with 9-1-1 dispatchers shows the role extension:

> CALLER: Now I don't see him, he was on the second floor we are on the third floor now calling you. I can see the front door entrance. I see the man down in front of the café he is about 100 yards in from the front entrance. I think there is more, I think the person up front at the secretary desk possibly got shot and is possibly down. Yep, I'll be right back; standby . . . all right I am back. We need somebody in here.

DISPATCH: We have got police and EMS on the way, can you stay on the phone with me for a while?

CALLER: I'll try, but I am like a sitting duck here

DISPATCH: Okay, then I want to you to lay down on the floor, hang up the phone and get down on the floor.

CALLER: All right, I will get on the floor.

DISPATCH: Get down on the floor try and protect yourself, you can hang up the phone.

CALLER: I am going to keep it open just in case.

DISPATCH: Okay, get on the floor, let me know if you hear anything.

CALLER: Another shot fired . . . .

DISPATCH: Another shot fired . . . .

CALLER: Sounds like he is he is still on the second floor . . . don't lay in front of that door (to another person). I see two people down now I moved up to a higher perch. A student is down . . . .

CALLER: (to someone else in the room) Call on the walkie-talkie tell them to stay down and tell him to lock themselves in. . . (to Dispatch) you got it?

> DISPATCH: Can you get on that walkie-talkie and tell everyone to lock themselves down?
>
> CALLER: We just did. (CPD 9-1-1 Recording, 2003)

The call shows how the employee remains on the phone with the 9-1-1 operator and moves to a position to better see what is happening to relay the information to responders rather than take protective action advised by the dispatcher. The employee also provides instruction to another employee to warn others over the walkie-talkie system. This shows maintenance and extension of the employee role during the shooting.

Finally, a group of employees who work in the building, but are not in it at the time of the shooting set up an emergent ad-hoc information center by emailing their contacts within the building to establish location and welfare. The long-time employees know most of the other employees in the building. They set up in an adjacent building, working the phones and emailing those they can contact. One of the employees first attempt to approach a plain-clothes police officer to propose the idea and the officer takes his name and information, but is not interested. Undeterred, the employee finds a willing detective who accompanies them to another building while they work. The detective states:

> I arrived at Dively…where we met (female employee). (male employee) asked (female employee) if it would be okay to use one of the computers to make e-mail contact with those who remained in the Lewis building, (female employee) granted permission. (female employee) worked the phones into the Lewis building while (male employee) typed a request for

> information to all persons inside Lewis. Within a matter of minutes the information began to flow (CPD Report, 2003).

The detective relays the information they develop together to law enforcement commanders. The insistence of the group of employees in the face of institutional disinterest demonstrates extension of work roles during the emergency. That the employees persist and find ways to gain information and offer it to police on the scene proves to be an essential extension of their expected roles as university employees.

Conditions: Helping behavior.

The cited statemens provided in prior sections of this case study illustrate several examples of helping behavior among survivors. The most common behavior is warning others of the danger. As described, helping behavior includes one of the first survivors in the immediate area of the shooting who flees to the basement and warns other students. Another example of warning others includes the following recollection by a survivor, who writes: "(Name) ran into (name's) office and back and said, 'He's on the bridge. He's on the second floor. He might be on the way to the third floor' He told everyone to go in their office and turn the lights off" (CPD Report, 2003). A second example also describes warning behavior: "Someone yelled out 'GET ALL THE SECRETARIES IN A ROOM.' Immediately after this statement was made, she heard a gunshot. She (professor name) next locked her office door and got under her desk with (student name)" (CPD Report, 2003).

Helping behavior also includes physical intervention with others to protect them. One survivor recalls that, "I don't know who it was, but someone grabbed me and pulled

me into a closet" (CPD Report, 2003). Another example also illustrates physical intervention between survivors. A survivor explains, "(Name) was in a meeting in Room (number) when (name #1) attempted to walk out of the room and they heard shots. (Name #2) pulled (name #1) back into the room and locked the door" (CPD Report, 2003). The survivor response to the shooting shows evidence of helping behavior, which include verbally warning others of the danger in the area, and/or running to other areas to warn people, and physically intervening to protect them.

Chronology: Shooter Moves to Other Areas of the Building

Following the initial contact with officers, the gunman's exact path over the several hours of the incident is uncertain. He does then proceed to the second floor, possibly by way of the third floor, to the office area of several professors. These instances of contact with survivors on the second floor and one professor on the fifth floor later are his last contacts with survivors. The remaining several hours include only contact between the shooter and law enforcement SWAT teams while survivors remain in secured areas or hidden from the shooter.

Three professors in this area are milling in the hallway, discussing next steps when the shooter comes to the area of their offices. Earlier, when the staff in the area come together after the initial shots, a staff member locks the outer doors that provide access to the area of the offices. Other staff in the area lock themselves into adjacent offices, some individually, many together. The thought among them is that the outer door provides them general protection. The locked door does not prevent access to the suite of offices from the area of the elevator. One of the professors sees the shooter and dives into

an office and closes the door; the other two professors initially do not see the shooter. The other two professors, one in an electric wheel chair, starts toward one of their offices. The first professor enters the office when the shooter appears. Police report the professor's description of the scene:

> A look of panic came over (name) face. He froze for a second, then took off . . . . The next thing I knew the shooter was standing in my doorway, his back against the opposite wall . . . I saw . . . the barrel of the . . . gun . . . and thought . . .really bad things can happen to me. And then I thought, but he is not going to get me. So I closed the door quickly, as he fired . . .the bullet went through the door (mostly through wood, but partly through smoked class), struck me in the sternum (CPD Report, 2003).

The bullet hits her in the chest, but it does not incapacitate her. She manages to lock the door, call 9-1-1, CWRU security, and others for help. She eventually hides in her closet. The second professor attempts to exit the area in his wheelchair when the suspect also fires at him. Police report the professor's description of the events:

> (Name) next reports it was at this time he slightly looked back and saw the shooter come up behind him and shoot at him. He reports this shot missed him and hit the window and into the closet…he pretended to be struck by the fired gunshot, by lying limp in his wheel chair. After the shooter walked away from him, (name) wheeled himself into his office and locked the door. Once inside his office he indicated he wanted to get out of the

> shooter's line of fire and crawled underneath his desk to hide until the police came (CPD Report, 2003).

A graduate student on the second floor also comes across the shooter as he looks to see what is happening. He runs as the gunman raises his weapon. The gunman shoots at him once, hitting him in the lower back. The student continues to run to the stairwell, down the stairs, and outside to police, who place him in an ambulance for transport. The final contact, this one with a professor, comes over an hour later on the fifth floor. The professor leaves his office to use a fax machine. Police report the professor's experience of the incident:

> (Name) stated as he looked at this male, the male glanced back at him and began pulling the slide back on the weapon. At this point, (name) reports he quickly jumped back into his office to avoid from being shot or hurt (CPD Report, 2003).

In each of the locations where the shooter makes contact with survivors, students and professors evaluate environmental cues—both audio and visual—in concert with social cues, and attempt to take protective action for themselves and those around them.

Conditions: Direct contact protective actions.

As described above, after receiving email and/or numerous environmental and social cues, some survivors do not initiate protective actions, leave from protected locations, or—apparently—think that broader protective actions might be effective. The survivors' actions previously described in response to the shooter include closing the door on the shooter, pretending to be dead, and jumping back into an office.

Consequences: Protective Actions

The actions taken throughout the incident protects students and staff from the shooter, resulting in fewer deaths and injuries. Actions in the basement, including hiding behind locked doors while being shot at, prevent further injury and death. Staff report that the shooter tests door handles on multiple floors. When the shooter finds them locked, he does not try any additional measures to breach the doors. As a result of the actions of the shooter, injuries could have been minimized to just the initial victim, if appropriate protective actions were implemented and maintained.

Chronology: SWAT Officers Enter the Building

At approximately 1630 hours, eight members of the CPD SWAT team enter the building. One SWAT officer attempts to describe the scene, writing that, "The silence when we first went into that building, I cannot even describe" (Kuriloff, 2006). The SWAT team proceeds to the body of the first victim in the first floor open area of the building. Two members of the team begin to drag out the victim when they take fire from the gunman from a second floor balcony. One team member explains their actions:

> At this time we attempted to reach this male in attempts to rescue him. As we made it . . . the male appears to have died . . . myself and (Officer name) then began to drag the male back to the east door . . . . (Officer name) and myself then carried the male to that east entrance door at which time the suspect opened fire on our entry team, and myself and (officer name) were forced to leave the body at that east entrance and take cover (CPD Report, 2003).

Two CPD SWAT officers return fire. This action forces members to leave the body of the student near the door and seek cover, an occurrence which prompts one SWAT Officer to say that, “My heart was beating so hard I could feel it bouncing off of my tactical vest” (Kuriloff, 2006).

CPD SWAT locates a receptionist hiding behind the main desk and escorts her from the building. The suspect appears two more times from the second floor balcony, with CPD SWAT officers returning fire each time. Reports estimate that the exchange of gunfire from the balcony occurs over a 45-minute period. As SWAT officers continue to organize and secure the first floor, the suspect points his weapon at officers twice from a third floor walkway; each time officers fire on him. He appears on the third floor two more times with officers firing at him each time.

By this time, mutual aid SWAT teams are arriving. The Cuyahoga County Sheriff’s Office (CCSO) SWAT team and Euclid PD (EPD) SWAT teams show up for support. CCSO replaces CPD on the first floor, giving them a chance to rest and reorganize. EPD SWAT secures the basement and removes sheltered occupants. In this period, FBI SWAT also arrives with information about an injured professor in room 275.

A combined group of SWAT officers moves to the second floor. They locate and evacuate the injured professor and all others on the second floor using master keys provided by CWRU security. The team attempts to move up to clear the third floor when the suspect begins firing at them. They initially back out of the stairwell, but the remaining cover officer engages the suspect, which forces the suspect to retreat up to the fifth level of the building. FBI SWAT remain on the second floor coving the evacuation

of survivors from the upper floors while CPD SWAT move to clear the third and fourth floors of the building. Of the police response, a professor evacuated from the second floor says: "I was amazed at how fast the police got there. I am very grateful for the professionalism and the manner in which we were treated" (CPD Report, 2003).

Conditions: Environment/architectural elements.

As described through the words of survivors previously in this chapter, the architectural elements of the PBL building allows for easy observation of the main areas of the building. Figure 4.2 shows an interior picture of some of the unique interior windows that enable observation of the main floor from different floors and several points. Police report on a survivor's description of the sightlines' utility:

> (Staff name) walked to her office window and was able to look down to the first level. (Staff name) saw a pair of legs, in blue jeans below her window . . . . (Staff name) then saw a male on the 1st floor walking towards the front entrance, and it looked like he was holding a gun. (CPD Report, 2003)

The interior architecture consisting of multiple observation windows, balconies, and walkways allow survivors to view activities on lower floors from areas of relative safety. The availability of safe observation points combine with the fact that the initial victim of the shooter remains in an observable area assists survivors throughout the building in defining the situation as problematic.

Figure 4.2. Peter B. Lewis Building Interior Windows. This picture shows some of the interior observation points that allow visual observation of the main floor atrium.

The same observation points on the balconies and walkways that provide advantages to survivors, offer the shooter ample shooting positions and disadvantage responders. The shooter uses these walkways and balconies to fire on law enforcement responders. The architecture provides challenges to SWAT teams and delays response.

Chronology: Ending the Incident

After clearing and evacuating the third and fourth floors, the initial officers securing the fifth floor are awaiting additional officers when one hears what sounds like the chambering of a round in room 501. CPD and FBI SWAT converge on the room. They take three rounds of fire from the suspect who is in a small room behind the main room projection screen. The officer gives the suspect verbal commands to which he complies. Officers handcuff and transport the suspect for treatment of gunshot wounds sustained during the event. The suspect is in custody at approximately 2257 hours, ending

the seven-hour incident. Following his arrest, SWAT teams conduct a second sweep of the building to ensure that it is clear of survivors and suspects before declaring an end to the emergency phase of the incident.

Conditions: Shooter actions, capability, and intent.

The irrelevance of the shooter's motivation is a fundamental assumption of this study. However, the actions of the shooter as they affect outcomes are of importance. In a statement to detectives, the shooter describes his intent to limit casualties:

> Yesterday morning when I work up I was upset and planned on going over to Case Western Reserve, but I didn't go until later in the day because I didn't want much casualties. Most of the students would be gone on Friday because the semester was over on Thursday (CPD Report, 2003).

By deliberately timing the shooting to occur at the end of the day after the conclusion of the semester, the shooter reports that he does not intend mass casualties in the incident. Although he does shoot his weapon and attempts to shoot his weapon at many more people than actually are hit, the shooter does not attempt to force access to any locked areas. This action could have changed the success of protective actions. He also wears body armor, showing that he intends to exchange gunfire with law enforcement.

A second issue is the capability of the shooter and his equipment. The shooter visited a gun shop the day before the shooting, requiring assistance to reassemble the second weapon that was with him during the shooting. In addition, several potential victims, including one in the first few seconds, report the shooter unable to fire. In several instances, survivors report that the shooter must cycle the action of the weapon. As a

result, they are able to escape or, in one instance, suffer less severe injury. Law enforcement evidence reports catalog numerous unexpended rounds throughout the building. This indicates that either the shooter has difficulty in the operation of the weapon or the weapon is malfunctioning. These shooter-based issues affect incident outcomes.

Consequences: Overall Event

The immediate consequences of the event were that one person was killed (student) and two were wounded (one student, one professor). The event timing, early recognition of the event as a shooting facilitated by social interaction, architectural advantages for survivors, early protective actions, helping behavior, role maintenance and extension by employees, and the potentially limited intent of the shooter led to few casualties. The event was covered by national media for a period of time in the immediate aftermath and beyond as the suspect was tried and convicted.

The event resulted in long-term changes in CWRU organization and policy. Following the event, CWRU developed its own police department. It replaced unarmed security guards with armed sworn law enforcement officers. In 2004, students formed a student-run, on-campus basic life support volunteer ambulance service. In the aftermath, the campus also adopted—and CWRU police teach—the ALICE (Alert, Lockdown, Inform, Counter, Evacuate) active shooter training program to assist students and staff. CWRU also made some interior modifications to the PBL building to include additional walkways to adjoin stairwells.

Case Study 2: Louisiana Technical College Shooting: February 8, 2008

The following sections detail the C-model elements for the ASE on the campus of Louisiana Technical College on February 8, 2008. Examination of the data, described in Table 3.2 (Chapter III), revealed 23 individuals who fit the study definition of a *survivor*. The experience of these survivors, as captured in the data, provides the basis for understanding human behavior in response to ASE within the context of this case. The case study presentation begins with examination of the broad characteristics. The characteristics of the event include brief background overviews of the organizations involved in the response to the incident: Louisiana Technical College (LTC), the agencies of the city of Baton Rouge. These include; the Police Department (BRPD), Fire Department (BRFD), and Department of Emergency Medical Services (BREMS). Different from the previous case, this event did not include responses by mutual aid resources or require extensive involvement by Fire or EMS resources.

The second section presents the chronology of the event, providing a narrative description of how the event proceeded over time. The description of the event uses the trace-forward technique beginning with the first shots fired. As key elements unfold in the description, the explanation infuses related conditions, additional specific characteristics, and consequences. The final section examines overall event consequences, which include the outcomes and resultant change.

Characteristics

Organizations.

At the time of the shooting, Louisiana Technical College (LTC) located in Baton Rouge, LA was part of the Louisiana Community and Technical College System. Historically, the site has been in continual use for the same educational purpose, but under different organizational names. Although the site of the shooting exists as it did in 2008, LTC no longer exists as "LTC." Since the shooting, it became the Capital Area Technical College, and recently it was joined with the Baton Rouge Community College (BRCC) as a campus within that system. Because LTC is no longer a functioning entity, certain information about the operation of the site in 2008 is unavailable. As part of BRCC, the site continues many of the same technical (leading to certificates of technical studies) and applied academic programs (leading to Associates Degrees). In 2014, the site serviced approximately 1300 students through its academic and certificate programs and employed approximately 50 full-time and part-time staff.

Returning to the time of this case, in 2008, the LTC received primary law enforcement services from the Baton Rouge Police Department (BRPD). The BRPD divides the city geographically for separate precincts for uniformed operation. The LTC site was located in the BRPD District One service area, approximately one mile from the District One Precinct building. The BRPD is a full-service law enforcement agency that employs approximately 789 police personnel (i.e., uniformed officers, dispatchers, specialty police positions). It is a large modern metropolitan police department that

maintains a full spectrum of specialized law enforcement units, including a tactical (SRT) team for high-risk situations.

The Baton Rouge Fire Department (BRFD) and Baton Rouge Department of Emergency Medical Services (BREMS) provide fire, rescue, and emergency medical response to the site. The BRFD provides primary fire and rescue response for the facility, and it has 582 employees, located in 19 stations throughout the city. The nearest facility is Fire Station No. 2, located seven-tenths of a mile from the site. The BRFD also has a full range of special capabilities including hazardous materials response. The BREMS is mostly collocated with BRFD stations and is responsible for all pre-hospital care within the city. It operates 13 transport units from 12 stations. Two paramedics staff each transport unit. As a result, a minimum of 26 paramedic/EMTs work on any given shift within the city.

LTC building.

The LTC site is a two-story building located at the corner of North Accadian Thruway and Winbourne Avenue in Baton Rouge, LA. The site is northeast of the downtown area of Baton Rouge. It is located in a mostly residential area and adjacent to Dalton Elementary School and Istrouma High School, which are local public schools.

The building is a traditional institutional layout with halls at right angles with offices and classrooms. It contains areas that serve as classrooms, offices, and large indoor and outdoor spaces that support technical programs such as welding and auto repair. The first floor consists of both administrative offices and instructional spaces for many programs. Several of the first floor classrooms lead to outdoor spaces that support

technical programs. The second floor consists of mostly classroom space and offices that support specific educational programs. The second floor also has exterior stairwells that allow direct entry to program and instructional spaces from the outside.

The incident began in a Nursing Program classroom, room 283. The classroom has three entry doors, two to the adjacent hallway and one into a large instructional space identified as a student activity center. The orientation of desks and tables in the classroom were with students faced to the west for instruction. The classroom is located near the atrium that features a curved stairway and open area allowing observation down to the first floor.

Chronology: Initial Moments

The shooting at the LTC building starts just prior to the first 9-1-1 call received to BRPD dispatch at 0835 hours on Friday February 8, 2008, a day of regularly scheduled classes at LTC. The facility has classes in progress in several programs although exact numbers of students and staff at the facility at the time are unknown based upon available data. The shooter, a student who recently has left the accelerated nursing program (cohort) before completion, enters the building and goes to the Accounting Office seeking copies of her transcript. Accounting Office staff sends her to the Student Services Office on the second floor of the building. From there she visits the Nursing Program Office, also on the second floor, contacts staff and arranges to pick up her transcripts on the following Monday. The shooter leaves and proceeds to the Nursing program classroom, room 283. Several students talk to the shooter in the hallway outside the classroom, as she has been part of the program until a few weeks prior. The professor

also talks with the shooter and advises her to wait in the hallway until students finish a timed test.

At the time of the incident, a female professor and 14 students (12 females and 2 males) are in the classroom, and the students are taking the test. During the test, the shooter enters the classroom and sits quietly in the back of the room. She then fires a six-shot Taurus .357 Magnum revolver, which is still inside her purse, at two students sitting in desks in front of her. She shoots each student three times in the back and head. As the shooter starts firing, students in the classroom, and those learning and working in other parts of the campus, begin to react.

Conditions: Definition of the Situation.

The students initially define the situation as something other than a shooting. When they later talked to police, the students within the room reported delays in recognizing the incident as a shooting. One students says: "I thought it was a light blowing out. I didn't know what it was" (Baton Rouge Police Department Interview [BRPD], 2008). Another states, "Everyone did not really know what it was we did not expect anything, so I thought something fell on the building" (BRPD Interview, 2008). A third student expands on the confusion:

> I was facing forward and all I can kind of remember was that I heard this loud bang…and my ears started ringing and I looked back, . . . [the professor] had always said about our old . . . projectors that we had and I thought that the projector . . . something had blown or busted in the projector . . . when I saw smoke rising, from the angle that I was at it

> looked as if it was coming up from the projector and then I heard it again (BRPD Interview, 2008).

Students located in the same room as the shooter consistently misidentify the noise they hear, believing something in their classroom environment has malfunctioned. Even the sight of smoke does not help survivors recognize the event as a shooting.

Within the classroom, the incorrect initial recognition of the event also follows with misidentification of the hazard location. Even though directly in the room with the shooter, survivors do not identify the location of the incident before additional environmental and social cues allow them to redefine the situation. One student explains, "I didn't know it was in the room; I thought it was in the hall because I didn't look back" (BRPD Interview, 2008), while another student introduces timing, noting, "not at the first moment I was like . . . thought that is kind of weird and my ears kind of popped, so never once did I think it was coming from inside of that classroom" (BRPD Interview, 2008).

A few key environmental and social factors lead to problems in survivor recognition of the event and its location. The first key factor is environmental. The shooter positions herself at the back of the classroom, which does not allow for direct visual observation by survivors. The second is the social factor of familiarity with the shooter. The shooter has entered the classroom without cause for concern among students, as she was formerly in the program and has a conversation with the professor immediately before entering the room. Although the door slam behind as she enters, many described an apologetic look on the face of the shooter. The shooting does not begin for several minutes after she enters the room, so the students' attention refocused

on the test. In fact, many survivors saw or talked with the shooter outside the classroom earlier, and/or heard the prior conversation with the professor and the shooter. At that time, the professor instructed her to return to the room following the test. A second key environmental factor is that the shooter fires the first volley of shots from inside her purse. When combined with her location behind the students facing the front of this class, it masks the initial visual cue of a weapon. Here, the environmental factors of location of the shooter and concealment of the weapon combined with the social factor of familiarity with the shooter affect initial recognition of the incident as a shooting.

Conditions: Protective actions.

The survivors in the classroom initially associate the noise of the gunshots with other possible explanations and then incorrectly identify the location of the hazard. This lasts only briefly as analysis of additional environmental or social cues result in a redefinition of the situation as dangerous and thus requiring protective action. Survivors describe social cues that lead to initial protective actions. One survivor explains that: "By that time, I realized I was seeing a shooting and everyone was hitting the ground. And there was an open door not far from me, and I could not go under the desk I was at, so I pushed them apart" (BRPD Interview, 2008). Another survivor says, "I didn't even realize to move until I saw everybody in front of me go on the ground because I am in the back of the class so I didn't see anything going on in the front" (BRPD Interview, 2008). Yet another survivor recounts the initial confusion, saying, "Everyone was screaming 'get down,' so I got down, and I crawled like closer to the wall and (student name) was here; someone else was here" (BRPD Interview, 2008). One survivor pinpoints an important social cue, noting, "I was up there in the front and I saw the teachers face, she

was real scared" (BRPD Interview, 2008). These survivors' recollections indicate the vital role the observation of social cues play in enacting protective behavior. Only once survivors notice others falling to the ground or recognize the fear in other survivors' voices or on their faces, do they act to engage in initial protective behavior.

Survivors also describe environmental cues that lead to redefining the situation and initial actions: "I didn't know what it was, I looked at the roof, because I guess the ceiling tile shattered, sprinkling and then it happened again and again. The third time I could smell it and I knew exactly what it was" (BRPD Interview, 2008). Another survivor describes his/her reaction:

> This eye had a blurred vision and I turned to see, so I was trying to turn right here with this eye to try to see was it an electrical something and then I heard BOOM, BOOM I said . . . Oh my God, I know what that is and that is not electrical (BRPD Interview, 2008).

Here, the survivor descriptions portray the collective behavior process of milling and keynoting leading to a definition of the situation, emergent norms, and protective action.

Conditions: Helping behavior.

Survivors process the cues differently, although the event happens in seconds. Initial protective actions, such as dropping to the floor, occurs at different speeds and, in some cases, with assistance from other survivors. In the initial period after the shots, the survivor behavior is social and helping. For example, one survivor explains, "I was scared to death, the projector's gone crazy, finally I saw people getting down on the floor and I was kind of in shock . . . and someone pulled me down to the floor" (BRPD

Interview, 2008).Another survivor also remembers helping behavior, saying, “I hurried and got under the table with them and (student name) covered me and (student name) up” (BRPD Interview, 2008). Still another survivor says, “(Student name) pulled me under the desk because I was still sitting there kind of looking around” (BRPD Interview, 2008).

Helping behavior also includes other kinds of direct physical contact as one survivor explains, “I remember I was laying on the ground, my classmates (student name) was just rubbing my arm and she said ‘It’s okay’ and I was just praying” (BRPD Interview, 2008). Another survivor notes, “I got down and I put my hand on (student name) head and I just heard her praying” (BRPD Interview, 2008). In the immediate threat period, survivors display helping behavior, including pulling other students to the ground, students covering one another, yelling to get down, and comforting other survivors. During the initial threat period, survivors exhibit no instances of panic behavior.

Chronology: End of the Initial Threat Period

Following the initial six shots, the shooter empties four shell casings and inserts one live round from her purse into one of the cylinders. She then places the weapon under her chin and pulls the trigger several times before it fires, killing her. Reports indicate that the time from the first shot to the final shot is just more than one minute.

Conditions: Secondary Protective Actions.

Survivors describe reassessment of initial actions with the analysis of additional environmental and social cues that serve as keynotes leading to secondary protective

actions. Some students directly observe the shooter fire the final shot, while others take action based upon the keynoting behavior of others. One survivor recounts his/her thought process, saying: "When she was reloading, I was contemplating should I run, should I stay here? If I stay here, what is going to happen? If I get up, am I going to draw her attention to me?" (BRPD Interview, 2008). Another survivor describes the conclusion of the events, stating, "I heard a thump and she dropped to the floor. That is when the whole class ran out because everyone was relieved" (BRPD Interview, 2008). Another survivor reiterates the previous survivor's thinking: "I felt and heard around me people getting up to run; I thought to myself, it must be safe to run" (BRPD Interview, 2008).

Survivors reassess their actions even without seeing the shooter. As one survivor explains, "I did not know she shot herself, all I knew was that people were leaving, so she must have either left the room, you know, giving us a chance to get out or something" (BRPD Interview, 2008). Another survivor notes the importance of the crowd: "After that I got up, and I kind of ran to the back of the room a little bit, and everybody was running to the front, so that is when I turned around and ran out the front and we went to (Program Director) into her office" (BRPD Interview, 2008). The crowd helps another survivor, who says, "I saw everyone running this way and I thought I better follow the crowd" (BRPD Interview, 2008). Whether or not survivors could see the shooter's suicide, they recount assuming safety based upon the crowd's reaction and acting to emulate its behavior.

The authority of the professor also is a critical social cue as one survivor explains, "Our teacher—everyone was saying 'get out, get out' . . . (Professor) was saying 'get out'" (BRPD Interview, 2008). In conjunction with the crowd, professorial behavior

helps to initiate secondary protective actions. Here, survivors again described the milling and keynoting process leading to a re-definition of the situation for secondary protective action. Secondary protective actions in this case consist of evacuating from the room to other shelter.

Conditions: Proximity and definition of the situation.

Students and professors outside the classroom in other parts of the facility also experience delays in recognizing the incident as a shooting, noting, "I walked into my secretary's office and bent over on the floor, I was working on, going to work with something and we heard the noise, which we thought something had fallen off the wall" (BRPD Interview, 2008). Another says, "We heard a noise, and he said it was a door slamming, and I went just want to make sure it wasn't a fight" (BRPD Interview, 2008). Yet another survivor states: "We heard screams and started hearing the instructor that was in the room beside of us say 'get down.' There was just a lot of screaming" (BRPD Interview, 2008).

The initial inability to recognize the incident as a shooting extends beyond the classroom. Students and employees in other parts of the building do not hear the noise of the shots due to the size of the building. Data limitations do not allow for deeper explanation of processes for those not interviewed by BRPD detectives, who interviewed only a few students and staff outside of the immediate area of the shooting.

Chronology: Initial LTC Responders Arrive

LTC staff members are the initial responders to the classroom. The initial organizational response by the LTC begins with the actions of the professor in the classroom:

> I started to see people ducking, getting down, and that's when it dawned on me . . . a gun . . . and I went, "Get the hell down!" or "Get down!" . . . something like that to the students. I can remember I screamed it, and I hit the ground and that stopped. . . . So I kind of looked up like this and as I'm looking up, she's spinning that thing on the gun (BRPD Interview, 2008).

Of the shooter, the professor says:

> She was either trying to put a bullet in or doing something. Well, I didn't play around then. I just grabbed the front door, opened up the door, and I said, "Get out!" and so that way everybody would kind of be able to get out of the room (BRPD Interview, 2008).

The professor takes charge of the classroom once she recognizes the danger, maintaining her role as an authority figure—a fact that survivors note. Of the professor's actions, one survivor says:

> The teacher told us to turn off the lights and close the door. We didn't know it was inside, we thought it was outside and it was her. . . . I was up there in the front and I saw the teacher's face, she was real scared and she got on the ground and crawled out and I followed right behind her (BRPD Interview, 2008).

Further, one survivor states, "Our teacher—everyone was saying 'get out, get out.' . . . (Professor) was saying 'get out'" (BRPD Interview, 2008). Yet another survivor states: "I was laying under the table, toward the door, when my teacher said to get out. I did not see them because they were behind me" (BRPD Interview, 2008).

The Nursing Department Program Director is located in an office just down the hall with her administrative assistant. She responds to the noise and realizes it is a shooting. She remains and directs students out of the classroom and into her office. She says:

> I saw all of them and I saw (student name) was crawling on his belly out the door, and I motioned for him to go down the hallway. I could see the majority of the students, but not (shooter's name) she went in the back door. I was at the front door (BRPD Interview 2008).

She further explains: "They were all huddled together, I got . . . (student name) out she went down the hallway and then the students just kind of jumped up huddled each other and were saying she shot herself" (BRPD Interview, 2008). Finally, she says, "I gathered them all up and took them and put them in my office behind closed doors, to protect them" (BRPD Interview, 2008). The Nursing Department Program Director, much like the professor in the classroom with the shooter, identifies the event as a shooting and takes protective action on behalf of students, maintaining her role as a teacher and leader. Similarly, the Nursing Department Administrative Assistant gathers the students and locks the door. The Administrative Assistant describes her actions:

> At that point, there were about seven of them in my office, I closed the door back because I did not know what was going on. But (Program Director) has a key, so she opened the door and let the rest of them in and told them to stay here. They stayed until the officer brought them downstairs. (BRPD Interview, 2008)

An LTC maintenance staff member is working in a restroom on the second floor near the classroom. He responds to the noise and arrives before the shooter's final shot, and then uses his radio to call for a campus lockdown. The facilities supervisor follows the initial radio call by the maintenance worker with a second radio announcement confirming the need for a lockdown. He calls administrative staff in the Chancellor's office by radio. After the event, he explains: "I heard (maintenance staff member) sound excited over the radio, just talking loud. I heard (facility supervisor) say 'where are you?' and then I heard (facility supervisor) later call to me and said . . . 'there is a lockdown, call a lockdown'" (BRPD Interview, 2008). Staff attempt to initiate a building-wide announcement calling for a lockdown. The announcement only reaches a portion of the campus classrooms. An unarmed LTC security guard arrives shortly after the initial radio call and enters the classroom with the maintenance worker. They check the condition of the survivors and wait for responders to arrive.

Conditions: Staff role enactment/extension.

The LTC staff roles in the initial response include those of professor, program director, maintenance worker, facilities supervisor, and security guard. The classroom professor maintains a leadership role, follows protocol, and directs students to take protective action. After initially recognizing the incident as a shooting, but not recognizing the exact location, the professor directs students to turn off the lights, close the door, and get down. These instructions show maintenance of role expectations in extraordinary circumstances. Although not enacted by students, the instructions are appropriate to the hazard. From student statements, it does not appear that these initial directions affected student actions until the professor provides secondary instructions.

The professor does not lead in the recognition of the incident as her statement indicates that keynoting behaviors of others in the room assist in her definition of the situation as a shooting. The professor gives secondary instructions to students to get out of the room and opens the door once she observes the shooter reloading. Many students report hearing the professor say "Get out!" Those instructions, coupled with observations and other keynoting student behavior, lead to the classroom evacuation.

The Nursing Department Program Director and maintenance worker respond to the classroom before the final shot. The Nursing Department Program Director motions to students from the hallway and brings them back to an office for shelter. She recognizes the incident as a shooting and engages in role extending behavior to help protect students. The maintenance worker also recognizes the incident as a shooting as he directly observes the final shot. He provides information over the radio to others in order initiate a campus lockdown and enters the room in an effort to assess the survivors' conditions. In the case of both employees, these are functions beyond the scope of basic job expectations and reveal role extension to deal with a problematic situation.

The facilities supervisor, who has oversight over both security and maintenance, and the unarmed security guard both respond to the incident. The information the maintenance worker provides as the event unfolds allows them to understand it is a shooting before they respond. They continue to the site and extend their roles to check the condition of the survivors and relay additional information.

Conditions: Other social roles.

The available data does not provide much information about other relationships among survivors. The reports identify one set of siblings and one heterosexual dating relationship in the classroom. The reports do not describe any specific actions taken because of the sibling relationship, other than the fact that they are sitting together.

During interviews with three students, the dating relationship is discussed. The male states: "My girlfriend was sitting next to me; I jerked her arm and we got down" (BRPD Interview, 2008). The female says, "(Boyfriend name) pulled me under the desk because I was still sitting there kind of looking around, didn't know what was happening" (BRPD Interview, 2008). A third survivor states, "I hurried and got under the table with them and (boyfriend name) covered me and (girlfriend name) up" (BRPD Interview, 2008). The interviews indicate that the boyfriend initially pulls his girlfriend to the ground and then covers both the girlfriend and her friend with his body to protect them. Following the last shots, the boyfriend ensures both his girlfriend and friend leave the classroom. These examples also show the maintenance of traditional gender roles during the shooting.

Chronology: Calls to 9-1-1

BRPD receives nine calls to 9-1-1 from the incident, the majority (six) from faculty or staff at LTC. The precise moment-by-moment timing of 9-1-1 calls in relation to the previously described activities is not clear. Two calls come from students and one from the sister of a student, who has received a call from her sister at the LTC site. The

calls are instructive, as they show developing social organization in dealing with a problematic situation by both student and staff. Call number one states:

> DISPATCHER: "Did you see anybody?"
>
> CALLER: "I haven't seen anyone. . . . Ms. (Faculty name), is anyone in the hallway?" "I have another instructor here with me, she is looking out in the hallway"
>
> DISPATCHER: "How many shots did you hear?"
>
> CALLER: "I heard at least 5 or 6" . . . . Is anyone in the hallway Ms. (Faculty name) (to a different name than previous)?" (BRPD 9-1-1 Recording, 2008)

A second call illustrates the way survivors work together to gather information:

> CALLER: A shooting, I believe on Campus of Louisiana Technical College; we think she shot herself. We all ran out of the room. . . . Seven-to-eight shots fired here in the classroom."
>
> DISPATCHER: What classroom is that?
>
> CALLER: "Ugh (student name) find out (discussion in the background with a number of voices). What is the room number? (to another group present) "What's the room number? They don't know the number" (from the background, a female voice says "248, room 248") (BRPD 9-1-1 Recording, 2008)

A third 9-1-1 call reiterates the social behavior of survivors:

> DISPATCHER: "Do you'll see anybody out there?"
>
> CALLER: Umm . . . hold on . . . Ms. (Faculty name) (sounds as if she is asking about hallway) . . . no there I don't see anyone that has been shot." (BRPD 9-1-1 Recording, 2008)

Those survivors who called 9-1-1 rely on the assessment of others to better relay information to 9-1-1 operators, asking questions about the shooter, the location, and the number of shots fired—all useful information for responding law enforcement.

Conditions: Division of Labor.

The calls show the exchanges happening in the background and coordination between students and staff to provide basic information to 9-1-1 dispatchers. These exchanges result in a division of labor between the person on the phone with 9-1-1 dispatchers and those who gather additional information. Also, as the majority of the calls (six) come from LTC faculty and staff, it is also an extension of their work roles.

Chronology: Response Organizations Arrive

The BRPD Dispatch broadcasts the shooting at 0837 hours. The first Unit arrives at 0840. BRPD Officers make immediate entry into the building and move toward room 283. They enter the room with LTC staff and determine that there is no additional threat. The BREMS arrive and declared the subjects dead. The initial response phase of the incident concludes before the arrival of specialized tactical units. The tactical unit (SRT) arrives later and conducts a search of the building. The team locates survivors locked in

classrooms and offices and moves them to holding areas for interview. The incident moves quickly from response to investigation of the crime scene and witness interviews. One professor describes the process:

> I think, I can't remember if that was the minute, shortly after that police were here almost immediately, it was a good feeling. They told us to stay in the rooms—security guard was there; he told us to stay in the rooms; the police told us to stay in the office (BRPD Interview, 2008).

Conditions: Shooter Actions & Intent.

Although the focus of this research study is not the motivation of the shooter, the shooter's actions and intent during the event are critical. In this case, the shooter has the opportunity and means to inflict more injury with the availability of additional ammunition, a functioning weapon, and remaining potential victims within the classroom and throughout the facility. The shooter simply chooses to end the attack. Based on these facts, the intent of the shooter in this case is not mass casualty. Categorizing the active shooter as an individual who intends to inflict injury on as many people as possible is too broad a generalization. The variable presented by the choices and intent of the shooter affects outcomes and the evaluation of protective action decisions.

Consequences: Overall Event

The event resolves with three deaths—two students killed at the scene by the shooter and the shooter taking her life occurring over approximately one minute. The nature of the event does not allow for the evaluation of protective actions for the survivability of an ASE. In this event, the shooter shoots two victims before they can

react to any cues that the incident is about to start. The event does allow for the explanation of reactions and interactions during the emergency period of an ASE, as traced above.

The event results in policy changes at the LTC campus. The second floor doors, previously open for student access from the exterior, are now locked. Access is now only through the main entrance of the facility. Certified police officers now serve as security for the facility, replacing unarmed security guards. The classroom where the shooting took place is in use for the Spring 2015 semester, which is the first time it has been used for instruction since the shooting. The entire facility is set for renovation over the next several years to modernize the structure. Other than some of the same staff working in the building, the only reminder of the shooting is a small stone marker in the front garden dedicated to the victims of the shooting.

The LTC shooting is not the subject of sustained national media attention like many other shootings, including the CWRU case. The main factor is the timing of another campus shooting. Six days after the shooting at LTC, the shooting at Northern Illinois University dominates headlines and national attention.

Summary

This chapter has reviewed the chronology and key themes of two campus active shooter events. In the CWRU and LTC events, key themes include recognition and definition of the event, protective behaviors, division of labor, social role maintenance, organizational role extension, helping behavior, shooter capability and intent, and

ecological characteristics. Chapter V examines these themes across cases and develops a model of survivor behavior in response to campus active shooting events.

CHAPTER V

CROSS-CASE ANALYSIS

This chapter presents the analysis across the Case Western Reserve University (CWRU) and Louisiana Technical College (LTC) cases examined in the previous chapter. The goal of this analysis is to "deepen understanding and explanation" of the behavioral response of survivors to active shooting events on college campuses (Miles & Huberman, 1994, p. 173). In order to achieve the understanding and explanation, this chapter explores the common themes across the cases.

The cases reveal common themes in survivor behavior. Table 5.1 details the themes from each case. The analysis of cross case themes begins with an examination of the recognition of the incident and advances through to protective action by survivors. A model of response behavior develops as the explanation proceeds. Following the examination of the themes that serve as process elements of the model, discussion moves to overarching factors that affect, enable, and inhibit the process. The following section of this chapter examines the theoretical implications of the model and advances a theoretical model considering the application and limitations of existing theories. The

final section of this chapter answers the research questions and reviews the propositions about the data.

Table 5.1

Themes Across Active Shooter Event Case Studies

Theme	LTC	CWRU
Definition of the Situation	X	X
-Delays in Recognition	X	X
-Social Interaction	X	X
-Social Observation/ Cues	X	X
-Environmental Cues	X	X
Protective Behaviors	X	X
Division of Labor	X	X
Social Role Maintenance	X	X
-Organizational Role Maintenance	X	X
-Other Social Role Maintenance	X	
Organizational Role Extension	X	X
Helping Behavior	X	X
Shooter Capability & Intent	X	X
Ecological Characteristics (Environmental / Architectural)	X	X

Defining the Situation to Protective Action:

A Model of Active Shooter Behavioral Response

The explanation of the definition of the situation by survivors begins with the receipt of information concerning the event. The following discussion focuses on the initial receipt of information by survivors in the opening seconds of the incident. Information about the situation reaches survivors by one of three routes. Information reaches survivors by (1) incident environmental cues (sensory – seeing, hearing, feeling,

and smelling), (2) social observations (seeing and hearing the behavior of others), and (3) social interactions with others. Survivors may initially receive one or more of these cues, particularly those present at the site of the initial shots fired and positioned to hear the shots and make immediate initial visual observations of both the shooter (environmental cues) and the behavioral reactions of others (social observations). This group takes in the most information about the incident by the fastest method. Other survivors receive information of the event by environmental cues that do not include visuals observations, essentially hearing the sounds of shots fired. Those in close enough proximity may receive environmental audio cues (shots) that include other audio cues such as screams or yelling of others (social observations). Survivors at further distances may only receive the audio cues of the shots (environmental cues). Finally, the last group of survivors receives information of the shooting from social interaction; essentially they are told by someone else, absent any environmental cues or social observations. Figure 5.1 details these routes of information flow to survivors.

Survivors who receive only environment audio cues of gunshots misdiagnose these as other possible causes. They identify initial shots as something falling (books, tables, scaffolding), firecrackers, equipment failures, etc. In the LTC example, the misattribution of the sound occurred within the same room as the shots. Confirmation required additional environmental cues (additional shots, smell of gunpowder), social observation of the keynoting behavior of others, or secondary action to confirm. This leads to the next segment of the model. In the CWRU example, few of the survivors were in the same area as the shooter. Most received the first cue as the sound of gunfire, which was also misattributed. In both examples, survivors without direct initial visual

observation took additional actions to gather information. This again leads to the next segment of the model detailed in Figure 5.2.

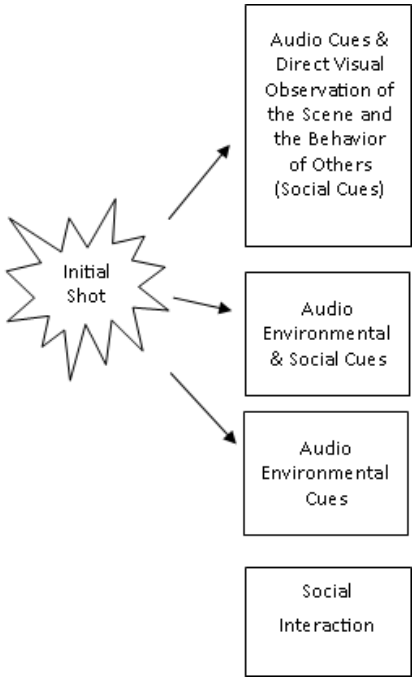

Figure 5.1. Active Shooter Information Flow to Survivors. Figure shows how information of the events flows to survivors.

Both cases provide broad examples of delays in recognition of the incident as a shooting. The survivors with multiple immediate information sources (i.e., those present for the initial shots) define the situation quickly and initiate protective behaviors. The most critical aspect is immediate visual environmental cues coupled with audio environmental cues and social observations. The LTC examples provides the limitations of simple proximity (in the same room), as the situation was not immediately defined due to the lack of visual observation (shooter in the back of the room and students facing front). Those with multiple cues, including visual, quickly moved to protective actions. The two cases show numerous immediate protective behaviors including dropping to the

floor, running to evacuate, running to shelter, using available objects for shielding, hiding, pretending to be deceased, locking doors, and barricading doors.

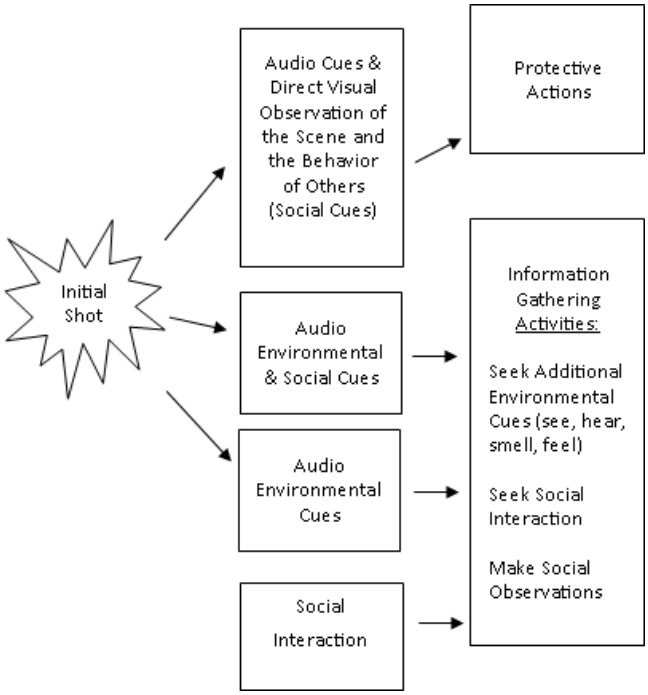

Figure 5.2. Initial Active Shooter Cues Lead to Action. Figure shows initial cues leading to protective action or information gathering activities.

Those without visual cues move to secondary actions to gather additional information. Figure 5.2 captures information-gathering activities that focus on seeking additional information in three areas: (1) environmental cues (see, hear, smell, and feel) (2) social interaction, and (3) social observations. Survivors may seek or receive information in all three areas simultaneously. In the case studies, information gathering activities included those as simple as looking to the source of the noise, moving to see the area of the noise, moving to observe the behavioral cues of others, and/or moving or

using technology (telephone, cell phone, email) to interact with others. This leads to explanation of the final process elements of the model outlined in Figure 5.3.

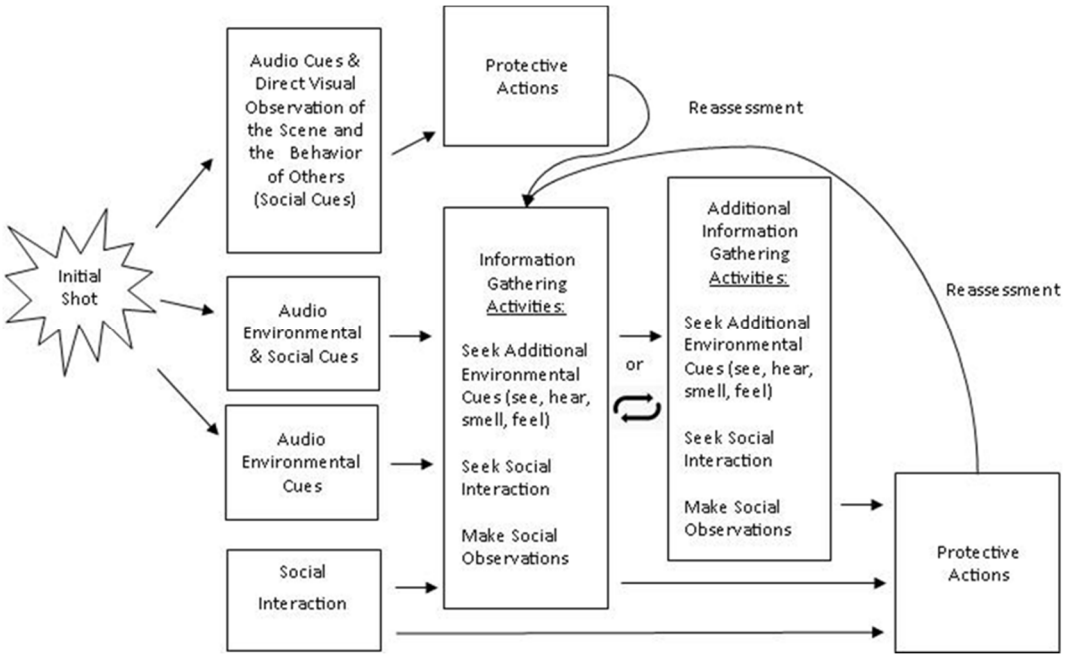

Figure 5.3. Active Shooter Survivor Response Process. Figure shows process of survivor behavior in response to active shooting.

As Figure 5.3 shows, information gathering is not necessarily a singular activity. For some, the additional information received from one activity may lead them to action. For others it may take many. Moving to the right on the figure shows that these activities may take place several times before the implementation of protective actions. In both cases, survivors used information gathering activities singularly, or multiple times to move to protective actions. Also indicated by the diagram, once survivors undertake protective actions they will reassess them by engaging more information gathering

activities. The reassessment may also lead survivors to modify or discontinue protective actions.

The final aspect of the process requiring explanation is the element showing social interaction leading directly to protective action. Both cases provide examples where survivors received information about the shooting through social interaction. These survivors were not in position to receive environmental cues or observe behavior, but took protective action when prompted through social interaction. The data did not allow for further examination of other factors, such as the nature of the relationship between the people providing information and the survivor. The model does show how in many of these cases social interaction alone moved to survivors to take protective actions.

Active Shooter Behavioral Response Model: Enabling and Inhibiting Factors

The preceding section explains the themes in a process model as developed through the two cases. This section completes the model, detailing the factors that affect the process elements. These factors constitute the remaining broad research themes and include: (1) division of labor, (2) social role maintenance, (3) organizational role extension, (4) helping behavior, (5) shooter capability and intent, and (6) ecological characteristic (environmental and architectural). These factors function within and affect the overall process to protective action. Figure 5.4 shows the full Active Shooter Behavioral Response Model with the factors identified as enabling or inhibiting the process. Many of the factors are closely related and not mutually exclusive, as the same action may exemplify multiple factors. The following sections explain each of these factors.

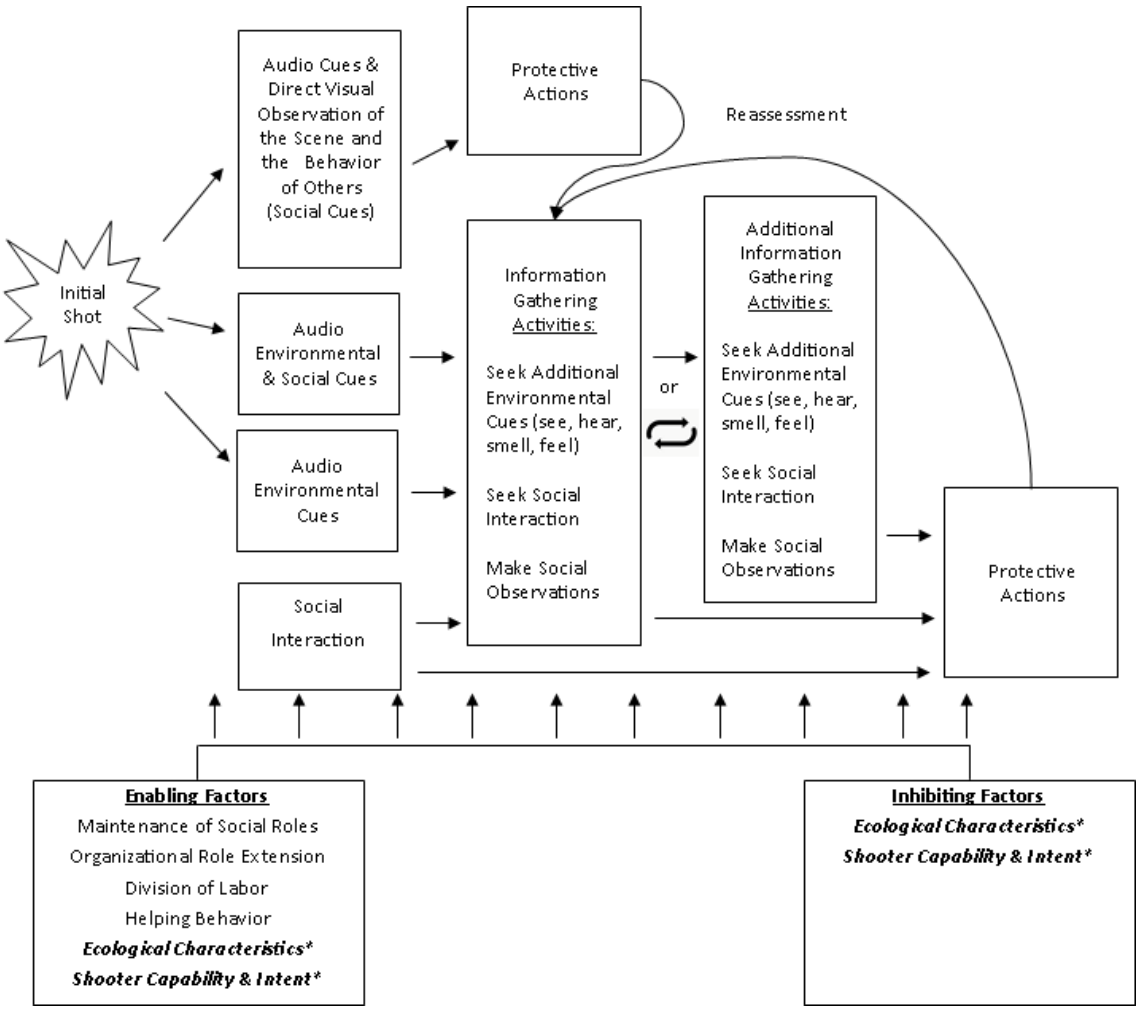

Figure 5.4. Active Shooter Behavioral Response Model. Figure shows full model of survivor behavior in response to active shooting.

Maintenance of social roles.

The data from the two cases show the continuity of social roles. To determine this, the data shows the actions of survivors. The data also reveals the general role of the survivor. The data allows the tracing of observations of actions back to the social context and expectations of their positions. The general roles during the event are employee (professor or staff), student, co-worker, friend, and dating relationships. The data did not

allow for establishment of many of these relationships beyond employee, student, and co-worker. Among the limited number established, roles remained intact. Employees on both campuses (professors and other staff) enacted roles fitting their positions in the face of the threat of an active shooter. Employees continued appropriate organizational functions including enacting general response protocols for active shooter events. Other personal relationships that could generally be determined between students and staff remained intact during the event. The cases show no examples of social breakdown in the response to the active shooter. This factor enables the survivor response process.

Organizational role extension.

During the event, survivors with campus organizational roles adapted their activities to changing conditions, thereby extending their roles. The focus here is to identify the behavioral responses of individuals during the event in the context of their roles within the organizations. In the response to both events, data shows key employees taking new actions as extension of their organization role based upon the changing conditions of the event. The events provide numerous examples. Four key examples are:

(1) The maintenance employee at CWRU who responded to the noise of the shooting, recognized the event, and gave radio direction to lockdown the building.

(2) The employee at CWRU who sent an email message to building employees to warn them of the shooting while the event was in still in progress.

(3) The employees at CWRU who established an ad hoc information center to communicate with employees sheltering in the building.

(4) A facilities employee at LTC who relayed visual observations of the shooting to dispatchers from a desktop while at risk.

Employees extending occupation roles enable survivor responses to the active shooting by using available organizational resources in unplanned ways to affect positive outcomes.

Division of labor.

The two cases show evidence of division of labor in the process leading to and enacting protective action. The data show survivors divide responsibility for a range of tasks during the process. These include division of tasks for information gathering. In both cases, survivors organized around those in contact with 9-1-1 operators to gather additional information for the caller to provide to dispatchers. Other examples include those who gathered additional information, individually or as a small group and returned to the group. Examples also show a division of tasks for protective actions between survivors, such as dividing to lock multiple doors. Survivors quickly working together to divide and accomplish tasks related to information gathering and protective actions enables the response process by more rapidly completing necessary steps.

Helping behavior.

The cases show numerous examples of helping behavior among the survivors. The most prevalent example is warning others of the event. The data show numerous

other examples of survivors physically protecting others and comforting them. This provides additional evidence of pro-social behavior and lack of social breakdown during the shooting. The data illustrate helping behavior occurring between students, between employees and students, and between students and employees. Helping behavior by its nature enables the response process during active shooting events the lack of competition and efforts to help others positively affects outcomes.

Ecological characteristics.

The cases show mixed effects of the physical environment on the protective behavior process. In the CRWU case, the architecture of the building was a key enabling factor in information gathering for survivors. Those not located in the general vicinity of the shooter could observe the main area of the building from dozens of observation areas including interior windows (Figure 4.2), walkways, and balconies. These observation points allowed for rapid confirmation of the event, due to both the location of the lone casualty of the event in an observable area and the availability of the observation points. In the LTC example, the location of the shooter, behind students facing toward the front of the classroom delayed initial recognition of the incident. The physical environment was also enabling due to two other possible exits from the room, enabling a few students to exit the room before the final shot. In these cases, the ecological characteristics of the physical environment may either enable or inhibit the survivor response process.

Shooter capability and intent.

The capability and intent of the shooter is a factor driving the behavioral response process. Within the context of the event, the actions of the shooter can enable or inhibit

the survivor response process. Most active shooter protocols assume the perpetrator is intent on mass casualties and will kill with impunity until survivors or response organizations exert pressure on the shooter. In these cases, the shooters, by action in the case of LTC, or by admission in the case of CWRU, were not intent on mass casualties. In the LTC case, the shooter had additional ammunition and access to survivors, but chose to end the attack. The shooter statement to law enforcement following the CRWU attack indicated that he chose the timing of the attack on a Friday afternoon after final exams to minimize casualties. In addition, the CRWU shooter did not attempt to breach doors into occupied spaces. Reports indicate that the shooter attempted doorknobs, but did not attempt to force entry into locked spaces. The choices of the shooter in these and other cases affect evaluation of protective action decisions.

In addition, the capability of the shooter influences the behavioral process. In the CWRU case and the LTC case, the capability of the shooter influences protective action decisions and ultimately survivability. In the LTC case, survivors reported that it appeared the shooter had trouble reloading the weapon, which could have led to the decision to stop the attack. In the CWRU, the shooter cycled new rounds into the weapon at several points, some resulting in the escape of potential victims due to a lack of ability with the weapon or its malfunction. Neither the capability nor the intent is discernable by survivors or responders during the event, however, these factors do affect the process.

The Active Shooter Behavior Response Model develops directly from the data of the two active shooting events. The behavioral path traced in this data results in a model similar in structure to the Protective Action Decision Model (PADM) (Lindell & Perry, 2004) and models of human behavior in fires (e.g. Canter & Tong, 1985) . The PADM is

the result of testing and retesting using data from dozens of disaster events, but these do not include an active shooting event. The resultant model from these active shooting cases shows similar patterns of reaction to warning messages and behavior in response other hazards. This provides evidence confirming both the structure of this model based on the data and the consistency of the general pattern of behavior for active shooter events with that in other disaster event types.

Theoretical Implications

Taking a step back from tracing the actual behavior of survivors grounded in the data in response to the shooting events allows for examination of the theoretical frameworks that may fit the data. The literature review introduced the emergent norm theory as a basis for most behavior based disaster research. The emergent norm theory also forms the basis for the PADM. The data supports the application of the emergent norm theory to survivor responses in active shooter events. Figure 5.5 shows the applicability of the emergent norm theory with a previously suggested caveat. The model below shows environmental cues and social interaction feeding into a definition of the situation as information gathering and protective behaviors take place within the establishment of new norms. These elements are consistent with the classic description of collective behavior and the emergent norm theory.

The model also shows consideration of the ecological factors of the event. Cornwell et al. (2001) in the study of the sinking of the M/V Estonia and Cornwell (2003) in the reexamination of the Beverly Hills Supper Club fire suggest integration of the ecological context and ecology theory with the emergent norms theory for the study

of disaster behavior. Cornwell (2003) describes the necessity in the context of the Beverly Hills Supper Club fire:

> If we argue that strong social bonds somehow pattern the evacuation process and likelihood of survival, we must estimate the effects of social bondedness and ecological constraints simultaneously. That is, we must separate the effects of physical constraints from those of social constraints (bond strength) (p. 621).

Although beyond the scope of this research, the same constraints can apply if we were to attempt to determine if protective actions are implemented with the same speed due to social interaction or the facilitation of information gather through multiple available points of observation in the PBL building. The ecological context is of importance in the response process and considered here as well.

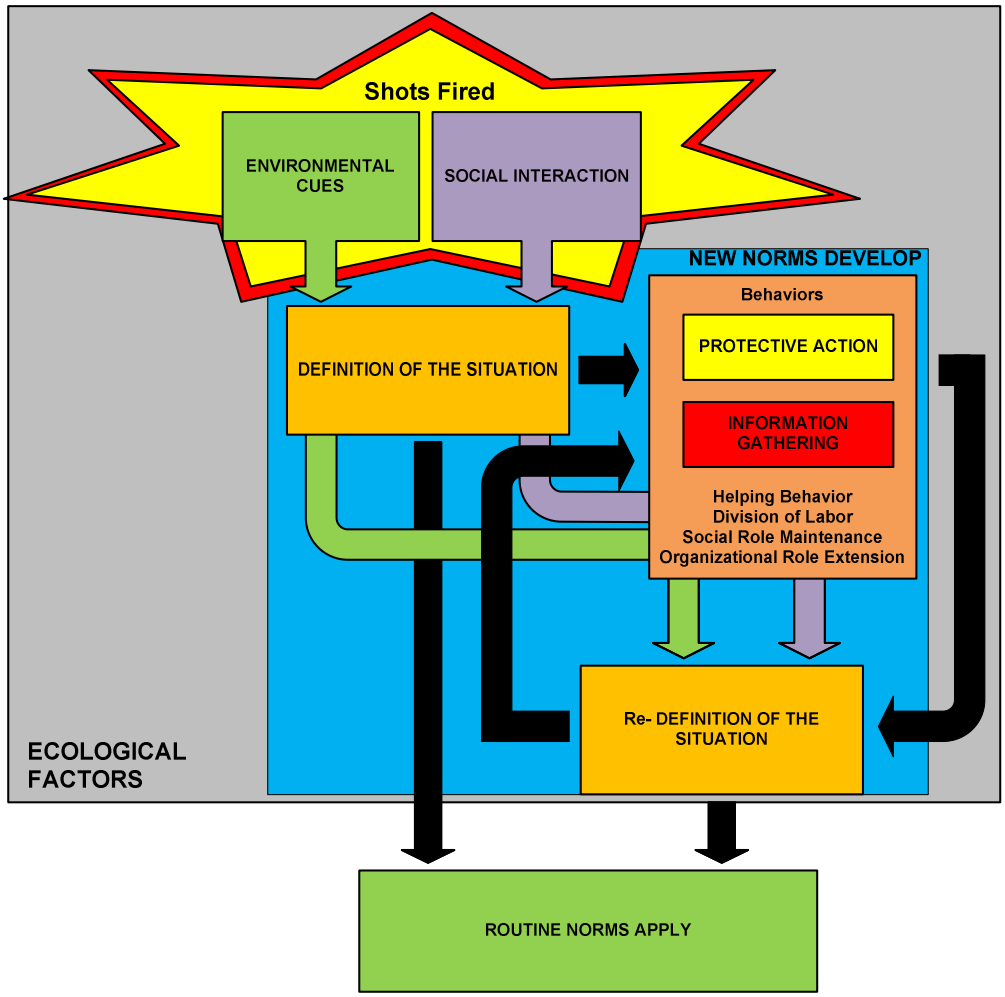

Figure 5.5. Theoretical Model of Active Shooter Behavioral Response. Figure shows theoretical elements of survivor behavioral response to active shooter events.

Research Questions and Findings

The preceding sections of the chapter implicitly answer the posed research questions of this study. The following section explicitly answers the questions and addresses the propositions about the data. The discussion of the themes, the presentation of the response behavior model above, and the direct evidence provided in the previous chapter makes the need for extended discussion unnecessary. The following focused

discussion proceeds with the goal of explicit answers to the research questions, addressing the propositions from the literature and reseating the findings of this study within the existing literature.

Research Question 1: What are the processes involved in collectively defining the socio-behavioral response to ASEs?

Propositions from the literature:

P.1.1. The response is social rather than asocial with an absence or isolated incidence of panic behavior.

P.1.2. The response includes helping behavior among survivors.

The Active Shooter Behavioral Response Model in Figure 5.4 shows the social nature of the behavioral response of survivors to active shooting events. The survivor behavioral response to active shooter events is consistent with 60 years of behavioral research of other disaster event types. The summary statement by Goltz, Russell and Bourque (1992) from their study of earthquake behavior is also applicable to this study. They write that "behavior in rapid on-set disaster is controlled rational and adaptive" (p. 65). Evidence of role maintenance, division of labor, and social interaction for information gathering and protective action implementation show the social nature of the response by survivors. This evidence confirms P.1.1. The cases also show numerous examples of helping behavior among survivors of active shooter events consistent with research based findings of behavior in other event types (Dynes & Quarantelli, 1977, 1980; Johnson, 1987a; Cornwell et al., 2001; Drury et al., 2009; Aguirre et al., 2011). This evidence confirms P.1.2. The data from these events also presents more evidence on

the debate concerning panic behavior in extreme events. Johnson (1987b) rejects the idea of panic as conceptualized by Quarantelli (1954; 1957). Johnson advances the concept of *unregulated competition*, as a function of a rational rather than irrational response to the conditions of the incident. While this research focuses on the Quarantelli (1954; 1957) conception of panic, the results do not help to settle this debate. The data does not show evidence of either conception of competitive or asocial behavior in these events.

Finding 1. The survivor response to campus active shooter events is social rather than asocial and includes helping behavior between survivors consistent with research findings in other disaster event types.

Research Question 2: How do social interactions and social organization emerge among survivors in a campus ASE?

Propositions from the literature:

P.2.1. The survivors response includes information seeking behavior to interpret environmental cues and warning information through interactions with others present and those in other social networks.

P.2.2. The survivors socially organize to deal with a new problem and decide on protective behavior implementation.

P.2.3. The survivors show maintenance and extension of social roles.

The evidence in these cases shows (Figure 5.4) that survivors seek interaction with others to gather and process information and establish a course of protective action. The explanation above describes the patterns of behavior observed in these cases and

generally follows established behavioral models in other event types (Canter & Tong, 1985; Lindell & Perry 2004). The data also show that visual cues are most important to survivors because these cues lead to early recognition of the incident and rapid implementation of protective action. This is consistent with findings from other event types that identify visual cues as the most important factor for implementing protective behaviors (i.e. Perry, 1994). Survivors more distant and/or without direct visual observation of the shooting scene, will misdiagnose initial environmental cues. Survivors attribute the noise to other possible events until additional environmental cues, social observations, or social interactions define the situation as a shooting. This is consistent with volumes of disaster research on other event types noted early by Fritz and Marks (1954) who describe, "the marked tendency of people to interpret disaster cues in normal terms" (p. 35). Survivors more distant from the site of the initial event, but within the building and able to hear the initial environmental cues were more likely to engage in multiple social interactions to confirm the interpretation of cues and decide on a course of action. The data also shows that survivors may contact others within their social networks, but not present through phone and email. This data also support findings by (Sattler et al., 2011) that show email messages as effective for notification and provision of instructions to affected populations during ASEs.

The themes related to social interaction to define the situation and division of labor provide evidence to confirm P.2.1 and P.2.2. The evidence shows that survivors will maintain social roles and extend organizational roles in the response to active shooter events consistent with findings in other disaster event types (Johnson, 1987a; Johnston &

Johnson 1989; Donald & Canter 1992; Cornwell et al., 2001; Drury et al., 2009; Aguirre et al., 2011) , confirming P.2.3.

Finding 2: Survivors of active shooter events will process environmental cues, social cues, and engage in social interaction to define the situation, gather information and implement and reassess protective behavior choices within a framework that maintains and extends social and organizational roles.

Research Question 3: What type of protective behaviors do survivors of campus ASE exhibit?

Proposition from the literature:

P.3.1. The survivors exhibit a range of behaviors appropriate to the situation to include evacuation, shelter, and information seeking behavior.

Across the two cases, survivors implemented a number of protective actions. When in direct contact with the shooter, survivors used available resources to barricade themselves from the shooter, take cover on the floor, hide, run to evacuate, run to shelter, and lock doors and turn off lights. Survivors continually process environmental cues, social observations, and engage in social interaction to assess and reassess protective behavior options. Survivors without immediate visual observation of the shooting scene took action to gather additional information, and then implemented protective actions. These actions also include running to shelter, running to evacuate hiding, locking doors, turning off lights, and barricading doors. The data confirms P.3.1.

Finding 3. Survivors gather additional information and process environmental cues, social observations, and social interactions to determine protective action behaviors that include taking cover on the floor, running to evacuate, running to shelter, hiding, using available resources to barricade themselves, locking door, turning off lights, and barricading doors.

Research Question 4: How do decisions for protective behavior arise among survivors in ASE?

Propositions from the literature:

P.4.1. The survivors show interaction for social confirmation of environmental cues.

P.4.2. The social interaction between survivors leads to decisions and division of labor for implementation of protective behaviors.

The process in Figure 5.4 shows how social interaction for information gathering moves to protective action decisions. The data shows that survivors interact for the confirmation of environmental and other cues. The explanation of research question two above also describes these as social interactions and social organization process lead to decisions for protective action. The data also reveal that survivors divide the tasks of information gathering and the implementation of protective actions. One example from the data is the coordination among survivors to lock several entrance doors to office areas. Consistent with the findings of studies in other disaster events, in this event survivors sought interaction with others collect and process information and to decide a course of protective action (Sime 1983; Sime, 1985; Cornwell et al., 2001). Consistent

with findings by Sime (1983), here survivors develop a group, rather than individual survival strategy. Survivor descriptions often referred to "we" instead of "I" explaining protective actions. The role of pre-existing relationships is an element of several studies. The findings here are also consistent with the propositions from the literature (P.4.1 & P.4.2).

Finding 4. Survivors show group level interaction for confirmation of environmental cues and processing of additional incident cues that lead to implementation and reassessment of protective actions many times with a division of tasks amongst the group.

Summary

This chapter presents the cross- case analysis for the active shooting events at Case Western Reserve University and Louisiana Technical College. The analysis of available data allowed for the construction of a model of survivor response behavior. The model, presented in this chapter shows the sequenced actions of survivors in the path from incident recognition to protective action. The chapter also discusses the theoretical implications of the model focusing on the emergent norm theory with the consideration of ecological factors of the event location. The final section of this chapter re-introduced the research questions and developed four findings based on cross-case data analysis. The following chapter examines the implications of these findings for policy, the limitations of the research and issues for future research.

CHAPTER VI

SUMMARY AND IMPLICATIONS FOR POLICY AND FUTURE RESEARCH

The key overarching finding of this study is that the empirically evidenced behavior pattern of survivors in active shooter events on college campuses are similar to that of research findings derived from other disaster event types. Survivors do not panic. They observe environmental and social cues, and socially interact to evaluate information and enact protective behaviors. Survivors organize and make decisions. They help each other, and many times do extraordinary things in dangerous conditions.

The study of disasters in the United States began with these natural and technological events serving as proxy for the expected behaviors following nuclear war. As new hazards develop, a tendency appears to dismiss the sixty years of research into human behavior in disaster and extreme events to say that these events are somehow different. More than forty years ago disaster researcher Allen Barton wrote:

> One of the major contributions of the last twenty years of disaster studies both qualitative and quantitative has been the exposure of widely held stereotypes as untrue, through careful observation and interviewing. We at least know that certain things both the public and the experienced

> professionals in the field believed – such as the generality of panic, "shock" anti-social behavior- are not true. (Barton, 1969, p. 61)

The events of 9/11 saw a renewed effort to dismiss the findings of disaster research and revive the myths of disaster behavior. The narrative is that the problem of terrorism is "different." Tierney (2003) notes, "following the tragic events of September 11, 2001, these myths are again gaining wide currency even though actual individual, group, and organizational behavior in the World Trade Center disaster directly contradict those assumptions" (p. 33). As Tierney states, research on behaviors in terrorist events show consistency in the hallmark behaviors from other disaster events. This study reviews several studies that confirm similar behavior in terrorist events with conclusions consistent with researched behavior in disaster (Aguirre et al, 1998; Drury et al., 2009; Gershon et al., 2011). As 9/11 gripped public attention, what Tierney dubbed the "9/12 syndrome" took hold. In the wake of the 9/11, the myths of disaster (massive panic, requirement for command and control orientations for response agencies, anti-social behavior, etc.) found the front of public and institutional perceptions of behavior.

Although disaster researchers warn of the potential that findings may not translate between conflict-crisis events (Quarantelli, 1993; Quarantelli, 2008), both in incidents of terrorism and ASEs as researched here, behavior patterns do apply. The public narrative of the active shooter hazard follows a similar path to the 9/11 narrative in the wake of increased shooting events and increased lethality. The line of reasoning follows the same logic in that active shooting events are different and therefore, the behavioral response is different. Some of the active shooter reference material cited in this study and many professionals in the field associate panic in the response of survivors to active shooter,

whether it is because of the use of an ill-defined term or a judgment about the response of survivors is unknown. In the case of the later, because of this research it is no longer an unknown, but now a notion that does not have empirical support. The following section of this chapter reviews the policy implications of this and other findings of the research. The chapter concludes with recommendations for future research and concluding remarks.

Implications for Policy and Practice

This section reviews the study findings and explores relevant issues for policy and practice for campus active shooting events.

Finding 1

The survivor response to campus active shooter events is social rather than asocial and includes helping behavior between survivors consistent with research findings in other disaster event types.

The view that active shooter and other events results in anti-social behavior calls for response models that take a command and control view of emergencies (Waugh, 1993). The underlying view is that response organizations will need to control the behavior of survivors, as they are unable to control themselves. This view also permeates early research driven by the military focus of response as Chapman (1964) describes the goal of research and modeling of disaster behavior is to "draw conclusions useful for controlling behavior in times of emergency" (p. 305). The application of command and control models is appropriate to the view of emergency event behavior as anti-social. As a result of this finding, collaborative and network response models are more appropriate

to the social behavioral response that actually occurs in active shooter events on college campuses (Waugh & Strieb, 2006).

Finding 2

Survivors of active shooter events will process environmental cues, social cues, and engage in social interaction to define the situation, gather information, *implement*, *and reassess protective behavior choices within a framework that maintains and extends social and organizational roles.*

In their study of the response of the Flint-Beecher tornado, Form and Nosow (1958) find that "an examination of the activities of the organizations that arrived on the scene soon after the impact reveals that they were successful to the degree to which they fitted themselves into the rescue pattern already established by local groups" (p. 112). This finding is so critical, but remains rarely implemented and generally not understood by responders and response organizations. The campus active shooting case shows that survivors organize, solve problems, and many times, do so creatively. Response organizations that understand the human behavioral processes underway at the time of the event can integrate into these processes and use them for developing situational awareness, exploit critical local knowledge and continue problem-solving efforts already started by survivors.

The recognition that survivors are not helpless and that many with organizational roles will be extending them to address unmet needs is critical. Responders should look for ad-hoc efforts that yield results and plug into them. The prime example from this research is the ad-hoc information center that developed among long-time employees at

CWRU with local personal knowledge of both the facility and the employees within the building. In short, response organizations should prepare to improvise and be flexible in response to use the opportunities that present themselves to enhance the response (Webb & Chevreau, 2006).

Finding 3

Survivors gather additional information and process environmental cues, social observations, *and social interactions to determine protective action behaviors that include taking cover on the floor, running to evacuate, running to shelter, hiding, using available resources to barricade themselves, turning off lights, and locking and barricading doors.*

Colleges and universities must assess facilities to ensure sufficient areas for shelter. Facilities must have the ability for students and staff to lock doors and turn out lights. The active shooter discussion should be as institutionalized as discussions about fire exits and fire egress. Students, faculty, and staff should have a general idea about their protective behaviors options in the common places that they work, learn, teach, and attend class. The shootings at libraries at Santa Monica College (2013) and Florida State University (2014) show the classroom is not the only vulnerable higher education facility. Tough questions for higher education settings include how many students know where they can shelter in libraries, student unions, and other public spaces in addition to classrooms? This presentation is made with the understanding that it is much simpler to say than implement, but they are real and present challenges.

Finding 4

Survivors show group level interaction for confirmation of environmental cues and processing of additional incident cues that lead to implementation of protective actions and the division of tasks for information gathering and implementation and reassessment of protective behaviors.

The study shows that survivors will reassess protective behavior options based upon additional information. Colleges and universities must have an avenue to communicate with survivors who have taken protective action to provide sheltered survivors with focused information. Mass warning systems alone may not be as effective for this focused purpose. A mechanism for reliable two-way communication with sheltered students and staff is important for survivors to continue behaviors that protect them and facilitate response efforts. Minimally, methods to communicate with staff, including part-time faculty with student responsibility, is necessary. Colleges and universities should be prepared to establish situational awareness with understandings of which affected facilities are in use, and what staff and students are likely to be in them. The technological capabilities exist, the question must be addressed: Are systems accessible for this purpose? Minimally, colleges and universities should be able to communicate reliably with sheltered staff for personal and student accountability and status.

Issues for Future Research

Although this study concludes that survivors in campus active shooting events behave in a manner consistent with behavior in other event types, this is not an ending

statement for the study of active shooter events, but a beginning with broad possibilities for future research. The central issue for research of active shooter events is access to and reliability of data. Newman et al. (2004) provide a number of limitations in studies of these events including access to survivors, impact of civil litigation even years after the incident, the traumatic aspect of the event, memory enhancement or decay for distant events, and an interest in certain characterizations of the event. These are problems endemic to retrospective studies seeking to capture new data a significant time after the event. This study uses primary data essentially frozen in time, collected in the immediate aftermath of the event by response organizations. This assists in removing many of the biases and reliability issues, but presents others. The main limitation is that researchers cannot ask new questions to survivors to obtain data of interest to study questions. The data essentially is as it appears, limiting deeper analysis in certain key areas. This presents issues with differences in local investigative methods, data retention for distant events, and state public information laws that may limit access to key information. This introduces many issues for researchers. Overall, a conflict exists between science and learning for the prevention of future loss of life and the privacy protections of the victims of the past. Data for other ASEs of interest during the time-period selected for the study was inaccessible due to exceptions in public information laws. Privacy won this battle, but raises the question, what would the victims want? The media exploitation of events makes the immediacy of strict privacy laws unavoidable, but with the understanding that they are a detriment to non-invasive scientific discovery.

The following paragraphs present several issues for future research in the area of campus active shooter events. The list is not exhaustive nor does it intend to describe all

aspects of the identified issues. The issues stem from the key findings of this research that require additional study. As this study is the first to examine many of the issues, the area is wide open for research in any aspect. The issues for future research include (1) incident recognition and (2) mitigation measures.

The most critical issue for future research is how to affect the incident recognition gap. This, as well as research on many other hazards, finds that truth in the adage that "seeing is believing." This research shows that visual cues are critical to survivor definition of the situation as a shooting. Questions for future research emerge: How can we close the incident recognition gap for campus ASEs? How do demographics and personal experiences factor into the recognition process? Are there reliable and cost-effective technologies that can identify a noise as shots fired and alert building occupants? If, so can they be as minimally effective as a fire alarm in alerting potential victims to the hazard?

A second issue that arose from the review of the literature is potential mitigation measures for campus ASEs introduced by Ergenbright and Hubbard (2012). The issue for research comes together with the impact of architectural characteristics as an enabler of survivor observation in the CWRU case. The potential inclusion of survivor initiated mitigation measures is worthy of future study. If the measures are effective, it creates larger construction and building code policy issues for study. What is the potential content of building codes that would require active shooter mitigation measures? Opportunities abound for research in this area.

Concluding Remarks

Unfortunately, the active shooter phenomenon is one aspect of American society that does not appear to be in decline. Research based empirical support for policy, programs, and response protocols are necessary now more than ever. Currently, debates rage on the practitioner side of the phenomenon about policy, best practices, and tactics for response. The role of research is to improve practice that can translate into saved lives. Research pushes beyond after-action reports and single case studies to get to understandings of phenomenon from the experience of multiple events. As shown here in the process of this research, we as first response organizations may hold many of the keys to understanding that we are prohibited to open to researchers. This is problematic for the academic role to help improve practice.

A multitude of professional disciplines are involved in preventing, protecting, mitigating, preparing for, and responding to active shooters on college campuses. On the practitioner side, the shared responsibility extends from those responsible for campus facilities to campus administrators to the field level emergency responders to the trauma surgeons who receive the victims and survivors in hospitals. In the scope of the problem, this research is a small swipe from one academic vantage point at one tiny aspect of a large problem in desperate need of continued research.

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APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL

Oklahoma State University Institutional Review Board

Date:	Tuesday, August 12, 2014
IRB Application No	AS1465
Proposal Title:	Social Organization in Victim Reaction to Campus Active Shooter Events: Lessons for Response
Reviewed and Processed as:	Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 8/11/2017

Principal Investigator(s):

Mark Landahl
7985 Pleasant Ct.
Frederick, MD 21701

David M. Neal
210 Murray
Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

☐ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval. Protocol modifications requiring approval may include changes to the title, PI advisor, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of the research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Dawnett Watkins 219 Cordell North (phone: 405-744-5700, dawnett.watkins@okstate.edu).

Sincerely,

Tamara Mix, Interim Chair
Institutional Review Board

APPENDIX B

AUDITOR'S REPORT

Audit Conducted by:

Paul L. Hewett, Jr., Ph.D.
Deputy Director & Senior Research Scientist
Center for Integrated Emergency Preparedness
Argonne National Laboratory

PURPOSE

This audit examines the methodological integrity and quality of findings for THE SOCIO-BEHAVIORAL RESPONSE OF VICTIMS TO CAMPUS ACTIVE SHOOTER EVENTS. The guidelines for conducting this audit were derived from Lincoln and Guba (1985), *Naturalistic Inquiry* and from Erlandson, Harris, Skipper, and Allen (1993), *Doing Naturalistic Inquiry: A guide to Methods*. Accordingly, the focus of this audit is on the trustworthiness of the inquiry and its findings. Specifically, this audit addresses the dimensions of credibility, confirmability, and dependability.

AUDIT PREPARATION

Mark Landahl asked me to conduct the audit in December 2015, just before he received his first batch of documents and other evidentiary material from the Cleveland Police Department. I have participated in, conducted, and provided oversight to several qualitative research projects and am familiar with the audit process as both an auditee and auditor.

I agreed to conduct the audit. Mark and I discussed expectations for the audit and agreed to a process for the audit. Due to work schedules, we established an audit process that included episodic submission of materials for assessment, concluding with a final audit to coincide with his submission of the final case study report. Mark provided me with copies of source materials from both the Cleveland and Baton Rouge police departments, his memo journal, and electronic copies of his NVivo coding reports. Additionally, Mark used me as his peer debriefer, offering me opportunities to better understand the evolution of Mark's thinking as he conducted his analysis.

AUDIT FINDINGS

The audit trail documents Mark provided reflect his methodological description and track from his initial working hypotheses, through his analysis efforts, to the final case study report. I found the audit trail thorough and complete. My assessment of the inquiry's trustworthiness, focusing on the dimensions of confirmability, credibility, and dependability follow.

Confirmability

Confirmability assess whether the case study is grounded in the data and the assertions made are logical. My assessment indicates that the case study report is grounded in the data.

To reach this conclusion I traced all chronology quotes and all 9-1-1 dispatch quotes and one half of condition quotes from each case from the relevant sections, back through the NVivo coding, to the related police report or audio transcript. Mark's NVivo files and codes made the process of tracing data to the words of the original source easy to accomplish. The quotes were exact as to what was presented in the documentary evidence. Thus, I can attest to the strength of Mark's logical inferences in the narrative.

Credibility

Credibility assess whether the participants' perspectives are accurately captured in the case report. My assessment is that Mark's analysis process and case report accurately reflects the participants' viewpoints. I made this determination by examining Mark's use of referential adequacy, triangulation, and peer debriefing.

Triangulation. Triangulation allows for cross-checking of perspectives through multiple sources and methods. While Mark's primary source for his cases was police department records (interviews, witness statements, dispatch and radio transmissions, etc.) he did seek and obtain media reports and other documentary evidence to provide a method to verify the case setting and chronology. Similarly, Mark conducted site visits to gain insight into the spatial aspects of each case and to understand witness sight lines, avenues of movement, and such. Thus, he was able to expand his primary source data by at least one other information source. For example, Mark used the site visit to Case Western University to add information (pictures of interior architectural features) to expand upon witness statements regarding the ability to receive visual cues from different observation points within the Peter B. Lewis Building.

Referential Adequacy. Referential adequacy is assessed through analyzing "set aside" sets of collected data for later recall to determine the acceptability of analyses and interpretations. Mark used some of his set-aside material for self-evaluation of his initial conclusions, as evidenced by memos and jotting in the Codes, CWU, and LA Tech sections of his reflexive journal and described in the case study report. I verified the existence of the set aside referential material and found it to be representative of the overall data set.

Peer Debriefing. Peer debriefing provides a process for using an outside professional who has a general understanding of the study to listen to the researcher's ideas and concerns regarding data analysis, working hypotheses, and emerging theories and models. Due to proximity and availability, Mark used this auditor as the peer debriefer. We had lengthy discussions (face-to-face, by telephone, and through computer-mediated communication tools) regarding the meanings of C-Model coding categories, the evolution of his situational awareness/protective action model, and the results of his site visits. I was able to trace changes in Mark's thinking with regards to code choices and model design made after these sessions in his reflexive journal, in model and code samples emailed to me for comment, and in the final case study report.

Dependability

Dependability is an evaluation of traceable variance caused by error, reality shifts, better insights and such that occur during the process of naturalistic inquiry. The audit trail provides the documentation that allows for an external check of the researcher's inquiry process. Mark's audit trail consisted of the case-related materials (transcripts, witness statements, 9-1-1 call recordings, police reports) he received from the Cleveland and Baton Rouge police departments, notes and photographs from his site visits, copies of media reports, coding records and memos (stored in NVivo) and his reflexive journal. The reflexive journal included memos and jottings grouped by case, methods, codes, analysis, and model development. The reflexive journal accounts for decisions made as to coding categories, shows how struggles with C-Model categorization were resolved, and Mark's reflection on and evolution of his situational awareness/protective action decision model.

CONCLUSION

Based on my examination of Mark's audit trail, I can attest to the trustworthiness of the case studies discussed in the dissertation. This is an authentic study that provides an important contribution to the understanding of the socio-behavioral response in no notice, immediately life-threatening emergencies.

/s/ Paul L. Hewett, Jr.

VITA

Mark R. Landahl

Candidate for the Degree of

Doctor of Philosophy

Thesis: SOCIAL ORGANIZATION IN SURVIVOR REACTION TO CAMPUS ACTIVE SHOOTER EVENTS: LESSONS FOR RESPONSE

Major Field: Fire and Emergency Management Administration

Biographical:

Education:

Completed the requirements for the Doctor of Philosophy in Fire and Emergency Management Administration at Oklahoma State University, Stillwater, Oklahoma in May, 2015.

Completed the requirements for the Master of Arts in Security Studies at the Naval Postgraduate School, Monterey, California in 2006.

Completed the requirements for the Bachelor of Arts in Political Science at State University of New York College at Cortland, Cortland, New York in 1996.

Experience:

Deputy Sheriff - Sergeant
Frederick County (MD) Sheriff's Office, 2001-present

Adjunct Associate Professor – Homeland Security Program
University of Maryland University College, 2007- present

Secondary Social Studies Teacher
Frederick County (MD) Public Schools, 1998-2001

Professional Memberships:

National Sheriff's Association – Member, Homeland Security Committee
International Association of Emergency Managers – Certified Emergency Manager
American Society for Public Administration – Section on Crisis and Emergency Management