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Active Shooter Event Severity, Media Reporting, Offender Age and Location

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Dissertation Submitted in Partial Fulfillment

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Abstract

Following the 1999 Columbine High School shooting, it was hypothesized that offenders used knowledge gained from news media reports about previous events to plan mass shootings. Although researchers have studied active shooter events, little research has been conducted on the factors that influence an active shooter's decision and ability to carry out such events. The purpose of this study was to evaluate the relationship between the rate of news media reporting about an active shooter event and the casualty rate of the ensuing event in the United States. The bracketed time of this assessment was between April 20, 1999, and June 15, 2016. The age and regional location of the subsequent shooters were examined as moderating variables. Social learning and social cognitive theories constituted the theoretical framework. Data were gathered from existing mass shooting and active shooter studies, Google News, and the ProQuest Central database. A Spearman's correlation analysis revealed no significant relationship between the rate of news media reporting about an active shooter event and the casualty rate of the ensuing event. The age and regional location of subsequent shooters were not moderating variables. However, a Spearman's correlation analyses did reveal a significant relationship between the casualty rate of an active shooter event and the amount of news media coverage the event received prior to the ensuing event. The study finding clarified the need for active shooter reporting guidelines, similar to existing suicide reporting guidelines. The implementation of such guidelines could reduce the regularity and severity of active shooter events, thereby improving public safety in the United States by reducing the regularity and severity of active shooter events.

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Dedication

This dissertation is dedicated to the victims of and the first responders whose lives were forever changed by the horrific events that formed the foundation of this study.

Acknowledgments

I would like to acknowledge my family and friends who have supported me throughout my academic career and the members of my dissertation committee, Drs. Jonathan Cabiria, James Herndon, and Stephen Rice, whose guidance throughout the dissertation process was invaluable to my success.

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Chapter 1: Introduction to the Study

Introduction

Prior to the Pulse Night Club shooting on June 15, 2016, which resulted in 49 deaths and 53 injuries, the Columbine High School, Virginia Polytechnic Institute (VPI) and State University, and the Sandy Hook Elementary shootings were the deadliest mass public shootings (MPS) in United States history (Goldman, 2016; New York City Police Department, Counterterrorism Bureau, 2012). When combined, these MPSs resulted in 168 casualties, including 121 deaths (Goldman, 2016; New York City Police Department, Counterterrorism Bureau, 2012). Following these event, news media outlets focused on the casualty rates the event, the nature of the victims, the location of the event, and the offender's ability to access and possess firearms (see Blau, Gorry, & Wade, 2016; Cavanaugh, 2014; Goldman, 2016; Hodges & Scalora, 2015; Krouse & Richardson, 2015; Metzl & MacLeish, 2015; Webster & Wintemute, 2015; Weinberger et al., 2015). Although these were not the first MPSs of their kind, they became media sensations due to the relatively high casualty rate of the events, the nature of the law enforcement response to the event, and amount of advanced planning undertaken by the offender (Cavanaugh, 2014; Cornell, 2015; Goldman, 2016; Hodges & Scalora, 2015; Siegert & Siegert, 2013).

Responding to public and political interest, academic and criminal justice researchers began studying MPSs. Since 1999, researchers have completed several regression studies resulting in the collection of a large amount of data related to MPS (see Blair & Martaindale, 2013; Blair & Schweit, 2014; Everytown for Gun Safety, 2014;

Follman, Aronsen, Pan, & Caldwell, 2012; Krouse & Richardson, 2015; Police Executive Research Forum, 2014; New York City Police Department, Counterterrorism Bureau, 2012). Studies conducted on MPSs occurring in the United States have been limited in scope, focusing mainly on the response of law enforcement agencies to and the regularity of MPS (see Blair & Martaindale, 2013; Blair & Schweit, 2014).

Many researchers agree that casualty rates and the frequency of MPSs are increasing in the United Stated annually (Blair & Martaindale, 2013; Follman et al., 2012; Police Executive Research Forum, 2014). Although, researchers are investing their time and resource in MPS research, they have yet to fully examine the factors that influence an offenders' decision to commit a MPS and/or the factors that might affect an offender's ability to carry out such an attack (see Blair & Schweit, 2014; Everytown for Gun Safety, 2014; Krouse & Richardson, 2015; New York City Police Department, Counterterrorism Bureau, 2012). Based on my review of the literature, studies have not been conducted of the relationship between the number of news media reports about an MPS, the age and regional location of subsequent offender(s), and the casualty rates of the subsequent MPSs.

Following the Columbine High School MPS, law enforcement and researchers began using the term *active shooter* to describe the law enforcement response to a MPS (Blair & Martaindale, 2013; Blair & Schweit, 2014; Follman, Aronsen, Pan, & Caldwell, 2012; Krouse & Richardson, 2015; Police Executive Research, 2014; New York City Police Department, Counterterrorism Bureau, 2012). Shortly thereafter, the term active shooter and MPS became synonymous with each other. However, when studying MPS

the term active shooter or active shooter event (ASE) refers to a specific subcategory of MPS rather than the law enforcement response to a shooting. An ASE is an event in which an individual or individuals are actively engaged in killing or attempting to kill people in a populated area and their actions do not stem from other criminal activity (Blair & Martindale, 2013; Blair & Schweit, 2014; New York City Police Department, Counterterrorism Bureau, 2012).

My intention in conducting this quantitative study was to determine if there as a significant relationship between the number of news media reports about an ASE and the casualty rates of subsequent ASEs in the United States between April 20, 1999, and June 15, 2016. I also wanted to assess the moderating effect of the age and regional location of subsequent active shooter offender (ASO) on this relationship. The foundation of this study is based on my hypotheses that: (a) ASOs learn from the actions of previous ASOs through news media reports, (b) the age of an ASO is related to the casualty rate of an ASE, and (c) firearm accessibility is a key aspect of these crimes. Results of this study could potentially create positive social change by changing the way news media outlets report about ASEs and by lending to the development of intervention or prevention strategies that reduce the number of ASEs or the number of casualties per event.

Background

On April 16, 2007, Seung-Hui Cho carried out a MPS at the VPI and State University resulting in 49 casualties, including 32 deaths (New York City Police Department, Counterterrorism Bureau, 2012). Similarly, on December 14, 2012, Adam Lanza murdered 27 people and wounded two others when he committed an MPS at

Sandy Hook Elementary School (Blair & Schweit, 2014). Reportedly, Cho and Lanza had been obsessed with previous mass murders, including Harris and Klebold (Kissner, 2015; Page, Daniels, & Craig, 2015; Siegert & Siegert, 2013). In a paper, Cho wrote for high school about suicide and homicide, he stated that he wanted to repeat the Columbine High School MPS (Page, Daniels, & Craig, 2015; Siegert & Siegert, 2013). Because the Columbine high school MPS occurred 8 years prior to the VPI and State University MPS, the only way Cho could have learned about the exploits of Harris and Klebold was through historical accounts about the event. The obsession of these individuals with previous MPS offenders has led law enforcement officers (LEO) to theorize that MPS offenders learn about other MPS offenders from news media reports and other media sources (Bushman, Gollwitzer, & Cruz, 2015; Saul & Fredericks, 2013; Siegert & Siegert, 2013).

Symbolic modeling and observational learning theories, as described by Bandura (1977; 2001) and Schunk (2012), provide an explanation as to how an individual, like Cho, learn about historical events. In their studies of violent media content, several researchers offer foundational theories that explain how violent media consumption may lead to violent behavior (see Bonus, Peebles, & Riddle, 2015; Bushman, Gollwitzer, & Cruz, 2015; Bushman & Anderson, 2014; Helfgott, 2015). When combined, these theories offer a theoretical structure for studying the impact of news media reporting on the casualty rate of ASEs. Based on my review of literature, ASE researchers have not applied this theoretical structure in studying casualty rates.

Circumventing firearms control laws, in 1999, Harris and Klebold bought firearms form a private owner and from vender at a gun show (Olinger, 1999). In 2007, Cho purchased firearms, even though he had had several legal and mental health-related issues that should have prevented him from doing so (Saul & Fredericks, 2013). Furthermore, in 2012, Lanza, who was legally prevented from buying firearms, had access to firearms purchased by his mother (Page, Daniels, & Craig, 2015). In all three cases (Harris and Klebold; Cho; and Lanza) the shooter(s) used those firearms to carry out three of the deadliest MPS in United State history (New York City Police Department, Counterterrorism Bureau, 2012).

Several researchers (see Blau, Gorry, & Wade, 2016); Fleegler, Lee, Monuteaux, Hemenway, & Mannix, 2013); Gius, 2015; Hodges & Scalora, 2015; Prickett, Martin-Storey, & Crosnoe, 2014; Webster & Wintemute, 2015)) have studied the impact of firearm accessibility, geographic location, and firearm legislation strength on the rate of firearm violence. Specifically, these studies found that an individuals' ability to access firearms is influenced by one's age, laws governing access to firearms, and the strength of regional firearm control legislation (Fleegler, Lee, Monuteaux, Hemenway & Mannix, 2013; Gius, 2015; Hodges & Scalora, 2015; Prickett, Martin-Storey, & Crosnoe, 2014; Webster & Wintemute, 2015). Firearm accessibility is a MPS risk factor because an individual must have a firearm to carry out a MPS. Firearm accessibility has not been thoroughly vetted by researchers as it relates to ASE and ASE casualty rates (Blair & Martindale, 2013; Blair & Schweit, 2014; Gamache, Platania, & Zaitchik, 2015;

Nekvasil, Cornell, & Huang, 2015; New York City Police Department, Counterterrorism Bureau, 2012).

When considering variables that influence an individual's ability to access and use firearms, I believe researchers need to examine the age, degree of cognitive development, and the financial resources of an individual. As an example, if an individual does not possess the financial resources necessary to train with or purchase firearms their ability to carry out an ASE is diminished comparatively. Likewise, if an individual does not possess the cognitive ability to apply firearm tactics and/or effectively plan an ASE their ability to carry out an ASE is reduced. Based on my review of ASE literature, researchers have not studied age as a moderating ASE risk factor. In summary, based on my review of the literature, researchers have not studied the extent to which the number of news media reports about a ASE and the age and location of the of subsequent ASO, affects the casualty rate of the ensuing ASE. I sought to address this gap in research by conducting this study.

Problem Statement

In the United States, many LEOs believe that ASOs use media reports about previous ASEs to plan deadlier shooting. This LEO belief is supported by the 150% increase in ASE casualty rates between 2009 and 2013 and the documented obsession of the Columbine High School, VPI and State University, and Sandy Hook Elementary shooters with previous ASEs (Bushman, Gollwitzer, & Cruz, 2015; Krouse & Richardson, 2015; Siegert & Siegert, 2013; U.S. Department of Justice, 2013). To date, ASO researchers have not studied the relationship between the number of media reports

about ASEs and the casualty rates of subsequent ASEs (see Chesbro, 2012; Kissner, 2015; Page, Daniels, & Craig, 2015; Schunk, 2012; Siegert & Siegert, 2013).

Researchers have found that the media habits of an individual correlates with his or her age and an individuals' age and regional location correlates with firearm accessibility (Fleegler et al., 2013; Prickett, Martin-Storey & Crosnoe, 2014; Yang & Huesmann, 2013). After reviewing the literature, it is my assertion that researchers have not studied the relationship between the number of media reports about previous ASEs and the casualty rates of subsequent ASEs. It is also my assertion that researcher have not studied the moderating effect of the age and regional location of ASOs on ASE casualty rates.

Purpose of the Study

My purpose for conducting this quantitative study was to determine if there was a significant relationship between the number of news media reports about an ASE and the casualty rate of the subsequent ASE in the United States between April 20, 1999, and June 15, 2016. In addition, I evaluated the impact that the age and location of the subsequent ASO(s), has on that relationship. The sample used in this study included all MPSs occurring in the United States between April 20, 1999, and June 15, 2016, meeting my operational definition of an ASE ($N = 55$). In this study MPSs in which an individual used a firearm to actively murder or attempt to murder people in a centralized populated area resulting in the murder of four or more victims by firearms were categorized as ASEs (see Blair & Martindale, 2013, Blair & Schweit, 2014; Kissner, 2015; Krouse & Richardson, 2015; New York City Police Department, Counterterrorism Bureau, 2012).

Additionally, MPS that stemmed from gang or drug violence, pervasive, long-tracked, criminal acts, accidental shootings, public suicides, or did not represent a threat to the public were not categorized as ASEs (see Blair & Martindale, 2013, Blair & Schweit, 2014; Kissner, 2015; Krouse & Richardson, 2015; New York City Police Department, Counterterrorism Bureau, 2012). I believe the incorporation of a strict definition of an ASE will strengthen the validity of this study when compared to studies with less restrictive definition.

Research Questions and Hypotheses

The following research questions and hypotheses were the basis of this study:

RQ1 (Quantitative): Between April 20, 1999, and June 15, 2016, was there a significant relationship between the number of news media reports about an ASE and the casualty rate of the subsequent ASE in the United States?

H_o1: Between April 20, 1999, and June 15, 2016, there was not a significant relationship between the number of news media reports about an ASE and the casualty rate of the subsequent ASE in the United States.

$H_1$1: Between April 20, 1999, and June 15, 2016, there was a significant relationship between the number of news media reports about an ASE and the casualty rate of the subsequent ASE in the United States.

RQ2 (Quantitative): Between April 20, 1999, and June 15, 2016, was there a significant relationship between the age of the subsequent ASO, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States?

H_o1: Between April 20, 1999, and June 15, 2016, there was not a significant relationship between the age of the subsequent ASO, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.

$H_ı1$: Between April 20, 1999, and June 15, 2016, there was a significant relationship between the age of the subsequent ASO, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.

RQ3 (Quantitative): Between April 20, 1999, and June 15, 2016, was there a significant relationship between the regional location of the subsequent ASE, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States?

H_o1: Between April 20, 1999, and June 15, 2016, there was not a significant relationship between the regional location of the subsequent ASE, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.

$H_ı1$: Between April 20, 1999, and June 15, 2016, there was a significant relationship between the regional location of the subsequent ASE, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.

RQ4 (Quantitative)**:** Between April 20, 1999, and June 15, 2016, was there a significant relationship between the age of the subsequent ASO, regional location of the subsequent ASE, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States?

H_o1: Between April 20, 1999, and June 15, 2016, there was not a significant relationship between the age of the subsequent ASO, the regional location of the subsequent ASE, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.

H_i1: Between April 20, 1999, and June 15, 2016, there was a significant relationship between the age of the subsequent ASO, the regional location of the subsequent ASE, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.

Theoretical Framework

Social learning and social cognitive theories were used as the framework of this study. Social learning and social cognitive theory describe the process by which an individual adopts new behaviors based on their experiences, observations, and interactions with the world around them (Bandura, 1977; Bandura, 2001; Schunk, 2012). Bandura (2001) and Schunk (2012) stated that social cognitive learning occurs through several constructs including symbolic and vicarious observations. Symbolic learning is the acquisition of knowledge through language, and/or mathematical/scientific schemes (Bandura, 2001; Schunk, 2012). Vicarious learning is the acquisition of knowledge through the observation of others (Bandura, 1977). News media reports including the television news, wire service news, newspapers and Internet posts allow individuals to learn based on the theoretical concepts of symbolic and vicarious learning (see Bandura,1977, 2001; Schunk, 2012). Furthermore, symbolic and vicarious learning

allows individuals to evaluate the consequences and benefits of the observed behavior without having to personally experience them (Bandura, 1977, 2001; Schunk, 2012).

Once an individual has observed a behavior, the individual can choose to adopt or reject the observed behavior (Bandura, 1977, 2001; Schunk, 2012). Research pertaining to vicarious and symbolic observation has shown that media, in all of its forms, is a significant source of vicarious and symbolic models that individuals, including ASOs, can use to observe, model, and adopt behaviors (see Bandura, 2001; Helfgott, 2015; Kissner, 2015; Page, Daniels, & Craig, 2015; Saul, & Fredericks, 2013; Siegert & Siegert, 2013; Schulman, 2013; van Krieken, Hoeken, & Sanders, 2015). Finally, exposure to violent, symbolic, and vicarious models, such as ASE news media reports, has been shown to increase micro levels of aggression in media consumers (Bonus, Peebles, & Riddle, 2015; Bushman, Gollwitzer, & Cruz, 2015; Bushman & Anderson, 2014; Helfgott, 2015). Therefore, I theorize that news media reporting about violent events may simultaneously educate and increase aggression in potential ASOs (Bonus, Peebles, & Riddle, 2015; Bushman, Gollwitzer, & Cruz, 2015; Clayborn & Garrison, 2015; Ferguson et al., 2015; Helfgott, 2015; Kissner, 2015; Siegert & Siegert, 2013). If subsequent ASOs are influenced by news media reports about other ASEs as theorized, then the number of news media reports about a ASE should correlate with the casualty rates of the ensuing ASE.

Based the social learning and social cognitive theory concepts, I hypothesize that these theories explain how ASOs, like Cho, used news media reports about ASEs to vicariously observe and formulate new behaviors (see Bandura, 2001; Bushman,

Gollwitzer, & Cruz, 2015; Schunk, 2012). I likewise hypothesis, that this theoretical approach explains the behavioral development and actions of Lanza, the Sandy Hook Elementary School shooter. Lanza, like Cho, was obsessed with Harris and Klebold and could have relied upon news media reports to learn about the Columbine High School shooting to vicariously observe and formulate new behaviors (see Bandura, 1977; Bandura, 2001; Bushman, Gollwitzer, & Cruz, 2015; Schunk, 2012).

In the framework of this study I hypothesize that the age and regional location of the ASO moderates the casualty rate of the ASE. This hypothesis is based on two factors: (a) the age of an individual and their regional location, as it pertains to the strength of firearm control legislation, impacts their ability to access firearms and (b) a firearm is necessary to perpetrate an ASE (Fleegler et al., 2013; Prickett, Martin-Storey & Crosnoe, 2014). Therefore, I included the age and regional location of an ASO as moderating variables in this study.

Nature of the Study

This study was a quantitative study that used archival data to determine if the casualty rate of ASEs can be explained retrospectively. My primary focus in conducting this study was to determine if quantitative research is consistent with understanding how the number of news media reports about an ASE impacts the casualty rate of subsequent ASEs in the United States between April 20, 1999, and June 15, 2016. My secondary focus was to determine if the age and regional location of subsequent ASO moderated that relationship. A correlation analysis was used in this study because it is the most effective means of determining which combinations of independent and moderating ratio

variables best explains the rate of a dependent variable (Wheelan, 2013). Correlation analysis, graphing, and assumption verification was used to determine if the selected method of analysis was suitable for use with the study variables and if additional analysis was plausible.

Initially, a retrospective multiple regression analysis utilizing pathway analysis and Hayes' Bootstrapping method was selected to evaluate the relationship between the independent and dependent variable as well as the degree to which the moderating variables affects that relationship. When using a continuous variable, such as age, multiple regression analysis is the most effective way to protect its continuous nature and in turn the validity of the findings. Figure 1 illustrates the Full Model of the pathway analysis that was initially selected. The interaction of unknown variables (represented by the letter d) on the dependent variable is also depicted (Figure 1).

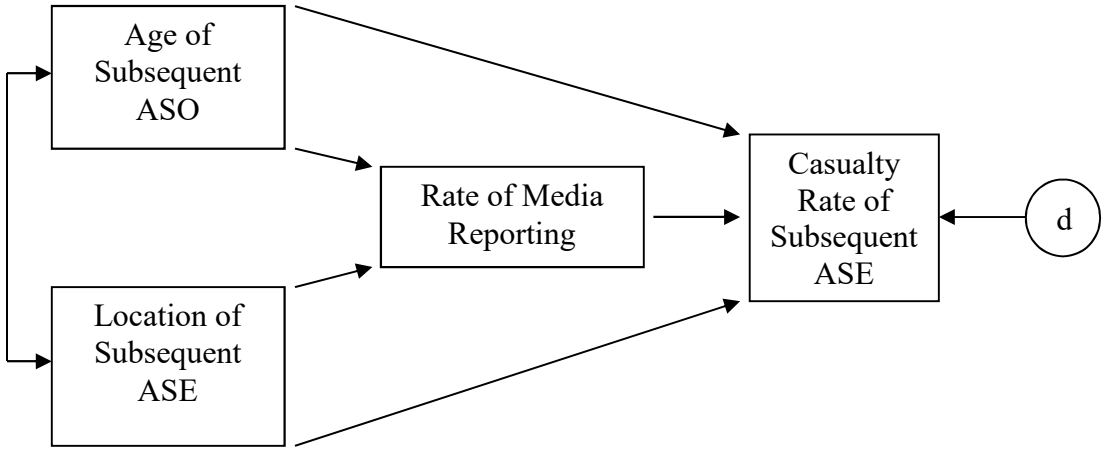

Figure 1. Full model, pathway analysis

This study contained one independent variable, two moderating variables, and one dependent variable. The independent variable was the number of news media reports about ASEs occurring in United States between April 20, 1999 and June 15, 2016. The two moderating variables were the age and location of the subsequent ASO. These variables were moderating, as opposed to mediating, because I theorized that the impact of the independent variable on the dependent variable was influenced by the age of and/or the location of the ASO. The dependent variable was the casualty rate of the subsequent ASE.

Secondary data sources were used in this study, including existing literature, media wire services reports, newspapers, blogs, podcast, and Internet posts. The Blair and Schweit (2014) Crime Prevention Research Center (2014), Everytown for Gun Safety (2012), Follman, Aronsen, Pan, and Caldwell (2012), and the New York City Police Department, Counterterrorism Bureau (2012) studies were used to create a preliminary list of MPSs occurring in the United States between April 20, 1999 and June 15, 2016. ProQuest Central database wire feed/newspaper/blog/podcasts/website archives and Google News services were analyzed using Boolean indicators (BI) to ensure that the initial MPS list was complete.

An intercoder process was used to analyze each MPS to determine if the event could be classified as an ASE based on my operational definition of ASEs. Data collected during the event classification stage was used to determine the age and regional location of each ASO as well as the mortality and the injury rate of each ASE. After the data was collected, SPSS software was used to conduct correlations analysis, graphing, and

regression analysis assumption testing. The goal of the analysis was to determine the degree to which the number of news media report about an ASE relates to the casualty rates of the subsequent ASE occurring in the United States between April 20, 1999, and June 15, 2016, and the impact the age and regional location of the subsequent ASO(s), had on that relationship.

Definitions

I used the following operational and conceptual definitions.

Dependent variable. The casualty rate of ASEs occurring in the United State, between April 20, 1999 and June 15, 2016. The casualty rate of an event was the total number of individuals murdered and/or injured during the ASE.

Independent variable. The number of news media reports about an ASE published to ProQuest Central wire feed/newspaper/blog/podcasts/website database and Google News prior to the subsequent ASE. The independent variable was measured as the average number of news media reports per day.

Moderating variables. The two moderating variables included in this study were the age and location of the subsequent ASO(s). The age of the ASO was measured in years. Locations were defined regionally as Northeast, Midwest, South or West.

Terms

The terms used in this study align with federal data collection processes as well as current mass murder, MPS, and ASE research.

Active shooter event (ASE). Any event in which an individual uses a firearm to actively murder or attempt to murder people in a centralized populated area resulting in

the murder of four or more victims by firearm and which did not stem from gang or drug violence, pervasive, long-tracked, criminal acts, accidental shootings, public suicides, or did not represent a threat to the public (see Blair & Martindale, 2013, Blair & Schweit, 2014, New York City Police Department, Counterterrorism Bureau, 2012; Kissner, 2015; Krouse & Richardson, 2015).

Active shooter offender (ASO). The individual(s) responsible for carrying out an ASE.

Boolean indicator (BI). Key words and phrases used to search databases and the Internet.

Casualty rate. The total number of people killed or injured during an event.

Child access prevention (CAP). Laws that mandate firearm storage practices and make adults criminally liable if an adolescent possesses a firearm without proper supervision.

Copycat effect. The mimicking of a previous offender's modus operandi in a crime.

Firearm control legislation. Legislation designed to control firearms including, but not limited to, legislation that hinders firearm trafficking, requires background checks for firearm purchases, prohibits certain individuals from possessing firearms, bans the possession of certain weapons and or accessories, and/or restricts firearms in public places (U.S. Bureau of Alcohol, Tobacco, Firearms, and Explosives, 2015; Fleegler et al., 2013; Kalesan et al., 2015; Webster & Wintemute, 2015).

Injury rate. The number of people injured during an event.

Long gun. A rifle or shotgun.

Mass murder. Any event in which four or more individuals are murdered in one or more locations relatively near each other (Krouse & Richardson, 2015).

Mass murderer. An individual(s) that commits a mass murder.

Mass public shooting. Any event in which four of more individuals are murdered by firearm(s) in one or more public locations or other public settings (Krouse & Richardson, 2015).

Modeling. Observational learning.

Modus operandi. The way a crime is carried out.

Mortality rate. The number of people killed during an event.

Outliers. A statistical observation that is distant from the others.

Permit-to-Purchase (PTP) laws. Firearm control legislation that requires an individual to apply for and be granted a permit to purchase a firearm.

Social cognitive theory. Expands upon the social learning theory theorizing that learning is not a passive activity, rather, that learning is a proactive process in which an individual's beliefs and cognitions influence what an individual learns, how an individual learns, and how an individual chooses to apply that information (Bandura, 2001; Schunk, 2012).

Social learning theory. Theorizes that individuals learn from their observations and interactions with the world through three primary mechanisms: (a) live modeling, (b) verbal instruction, and/or (c) symbolic modeling (Bandura, 1977).

Supplementary homicide reports (SHR). Part of the Federal Bureau of Investigations Uniform Crime Report, which provides additional in-depth data related to reported homicides.

Symbolic learning. The ability to learn based on a shared language and/or mathematical/scientific scheme (Bandura, 2001; Schunk, 2012).

Uniform crime report (UCR). A crime report containing data collected by the Federal Bureau of Investigations from local, state, and national law enforcement agencies.

Vicarious learning. The ability to learn through the observation of a third party's behavior and the consequences or outcomes of those behaviors (Bandura, 1977).

Assumptions

I identified two groups of assumptions in this study, assumptions pertaining to the study design and assumptions pertaining to methodology. When conducting a retrospective multiple regression pathway analysis utilizing moderating variables, the following assumptions are made and must be met:

- Variables can be measured by interval-ratios
- There is a linear relationship between variables
- There is no or little multicollinearity
- There is residual independence
- The dependent variable is continuous
- Variables are normally distributed
- Homoscedasticity exists

- The relation between the moderating/mediating variables and the criterion variables is significant
- Variables are measured without error
- That the specified relationship is correct.
- Unknown or excluded variables have an unknown effect on the dependent variable

While developing this study, I made five assumptions. First, ASOs learn about previous ASOs and ASEs from news media reports. Second, the information gained from those reports influences the casualty rate of the subsequent ASE. Third, the regional strength of firearm control legislation, including age and mental health prohibitions, influences the level of access (+ or -) that ASOs have to firearms. Fourth, based on the regional strength of firearm control legislation the age and regional location of the ASO influences the casualty rate of ASEs (Gius, 2015; Kalesan et al., 2013; Webster & Wintemute, 2015). These assumptions are critical to the LEO theory that ASOs learn from news reports about previous ASOs and that that knowledge has created a copycat effect resulting in magnified casualty rates (see Chsebro, 2012; Helfgott, 2015).

Additionally, with an ASO death rate of approximately 69% (suicide 45.6%, killed by police, 23.6, $N = 55$) there is no way to determine if all ASOs are learning from news media reports about ASEs and therefore, the fifth assumption is that ASOs do learn news media reports. This assumption is supported by the copycat nature of many ASEs and references to previous offender by subsequent ASOs (Helfgott, 2015; Kissner, 2015;

Page, Daniels, & Craig, 2015; Schulman, 2013; Saul & Fredericks, 2013; Siegert & Siegert, 2013).

Limitations, Delimitations, and Scope

There were two groups of limitations in this study, limitations created by the study design and limitations created by the methodology. When conducting a retrospective multiple regression pathway analysis utilizing moderating variables, the following limitations exist:

- Causation cannot be assumed based on correlation (Field, 2013; Meehl & Waller, 2002).
- The best model of significances cannot be determined (Meehl & Waller, 2002; Streiner, 2005).
- Models with identical correlations patterns cannot be distinguished (Meehl & Waller, 2002; Streiner, 2005).
- Sample size limits accuracy; the smaller the sample size the less accurate the analysis (Field, 2013).
- The effect of excluded or unknown variables on the dependent variable limits accuracy of correlational relations (Streiner, 2005).
- A significant relationship must exist between more than one variable to conduct a pathway analysis (Streiner, 2005).

When conducting a correlation analysis, the following limitations exist:

- Causation cannot be assumed based on correlation (Field, 2013; Meehl & Waller, 2002).
- Variables cannot be nominal (Field, 2013).

The five most significant limitations to this study, based on the methodology, was my operational definition of an ASE, the use of a nominal variable, the period studied, the effectiveness of the BIs locate relative news media reports, and the effectiveness of the search engines used to locate news media reports about each ASEs. In this study, an ASE was defined as any event in which an individual uses a firearm to actively murder or attempt to murder people in a centralized populated area resulting in the murder of four or more victims by firearm(s) and which did not stem from gang or drug violence, pervasive, long-tracked, criminal acts, accidental shootings, public suicides, or did not represent a threat to the public. My operational definition was a limitation because it contained a casualty rate criterion of ≥ 4 as well as criterion that exclude MPSs caused by other underlying criminal acts. However, by setting these limitations, the included events represented ASEs in the strictest form and align this study with current federal data collection and mass murder research norms.

The regional location of an ASE or and ASO were assigned per U.S. Census Bureau Regions and Divisions with states Federal Information and Processing Standards (FPIS) codes map (U.S. Census Bureau, 2015). Each region was assigned a number. Because the regional locations were assigned a number (1-4) that did not represent an

actual value this variable is nominal. The use of a nominal variable with four categories limited the number and type of analysis that could be conducted (Field, 2013).

ASEs occurring in the United States after April 20, 1999 were selected because the term ASE and the vast amount of media attention paid to such events did not occur until after the 1999 Columbine High School MPS, making the date of that event an optimal starting point (Blair & Martindale, 2013; Blair & Schweit, 2014; New York City Police Department, Counterterrorism Bureau, 2012). Further, 1999 was also selected because of the differences in the availability of news services in the form of the Internet, cable television, and satellite prior to and after 1999. This study was also limited by the exclusion of ASEs that occurred outside of the United States. ASEs occurring outside of the United States were excluded to avoid differing cultural influences and variations in crime data access laws that could have impacted the validity of the results.

This study was limited by my ability to locate news media reports about each ASE. The number of news media reports included in this study was limited to those contained in the ProQuest Central database and available through Google search engine via the Google News tab. The included news media reports were further limited by the ability of the BIs to locate all the available news media reports. However, the results of the study are valid based on the application of identical search methodologies for each ASE. By doing so I theorized that the rate of inclusion or exclusion of available news media reports was consistent across the study ensuring statistical accuracy.

Finally, the scope of this study was limited to all MPS(s) occurring in the United States between April 20, 1999 and June 15, 2016, which met my operational definition of

an ASE. Based on a review of the literature and my operational definition of an ASE, the probable number of ASEs was finite ($N < 55$). Because the number of ASEs occurring in the United States between April 20, 1999, and June 15, 2016, was finite, all known ASEs were included in this study. The inclusion of all known ASEs occurring in the United States, between April 20, 1999, and June 15, 2016, limited the scope of this study to the included events. Because the scope of the study was limited to the included events the generalization of the findings across all MPSs was impossible.

Significance

This study is significant because I focused on the ways in which three previously unexplored variables: (a) the number of news media reports about an ASE, (b) the age of the ASO, and (c) the regional location of the ASO, impacted or influenced the casualty rates of the subsequent ASE occurring in the United States, between April 20, 1999, and June 15, 2016. Moreover, the results of this study provided insight into the degree to which the included variables influence ASOs, the way media outlets report about ASEs, and the common LEO theory that ASOs learn from news media reports about ASEs. Insights from this study could improve the ability of LEOs, policymakers, and psychologists to create effective interventions that might help reduce the rate of casualties during ASEs as well as the regularity of such events. Based on the extensive history of MPSs in the United States, ASEs are likely to continue to occur making this research a necessity (Blair & Martaindale, 2013; Blair & Schweit, 2014; New York City Police Department, Counterterrorism Bureau 2012; U.S. Department of Justice, 2013).

Summary

This chapter introduced and discussed the threat that ASEs pose to the public in the United States (Blair & Martaindale, 2013; Blair & Schweit, 2014; Everytown for Gun Safety, 2014; Follman et al., 2012; Police Executive Research Forum, 2014; New York City Police Department, Counterterrorism Bureau, 2012). This chapter also specified the purpose, the research questions, the theoretical framework, the nature, and the significance of the study. The limitations, delimitations, and the scope of the study were also introduced. Finally, this chapter offered operational definitions of keys terms and related the guiding assumptions of the study. In Chapter 2 current literature regarding, social learning theory, social cognitive theory, the categorization of MPSs as ASEs, and firearm control legislation will be reviewed. Chapter 3 will detail the methodology that was used in this study including data collection and analyses processes.

Chapter 2: Literature Review

Introduction

Following the 1999 Columbine High School shooting, the terms active shooter, active shooter incident, and ASE were used to describe MPSs that occur in workplaces, open spaces, and schools (Blair & Martaindale, 2013; Blair & Schweit, 2014; Follman et al., 2012; Police Executive Research, 2014; New York City Police Department, Counterterrorism Bureau, 2012). However, the term ASE, when used by LEOs, refers to the law enforcement response to a MPSs that may or may not be an ASE (Blair & Martaindale, 2013; Blair & Schweit, 2014; Follman, Aronsen, Pan, & Caldwell, 2012; Krouse & Richardson, 2015; Police Executive Research, 2014; New York City Police Department, Counterterrorism Bureau, 2012). Differences in the way the term ASE is used can create confusion among researchers, LEOs, and members of the public. Regardless of the name used to describe this subcategory of MPSs, both the casualty rate and frequency of these events are increasing annually in the United States (Blair & Martaindale, 2013; Blair & Schweit, 2014; Krouse & Richardson, 2015; U.S. Department of Justice, 2013). Although, researchers often disagree as too which MPSs should be categorized as ASEs (see Blair & Martaindale, 2013; Blair & Schweit, 2014; Follman, Aronsen, Pan, & Caldwell, 2012; Krouse & Richardson, 2015; Police Executive Research, 2014; New York City Police Department, Counterterrorism Bureau, 2012), the public and the media need to be educated as to the difference between an active shooter response by law enforcement to an unknown and developing event and an actual ASE.

Towards that end, the term ASE was clearly defined in this study to protect the validity of the result.

In the United States, LEOs believe that ASO study news media reports about ASOs and ASEs and use that knowledge to become more effective, which resulted in a 150% increase in ASE casualty rates, between 2009 and 2013 (U.S. Department of Justice, 2013). The Columbine High School, VPI and State University, and Sandy Hook Elementary shooter's obsession with previous ASEs, as well as an increase in both ASEs, and ASE casualty rates annually between 1999-2013, provides circumstantial support for this LEO belief (Bushman, Gollwitzer, & Cruz, 2015; Krouse & Richardson, 2015; Siegert & Siegert, 2013; U.S. Department of Justice, 2013).

Researchers have found evidence that news media reports influence ASOs (see Siegert & Siegert, 2013). However, based on my review of the literature, researchers have not studied the relationship between the number of news media reports about an ASE and the casualty rates of subsequent ASE. Nor have ASE researchers studied how the age and the regional location of ASOs influences that relationship even though: (a) the impact of media on an individual correlate with the age of the media consumer, and (b) an individual's access to firearms correlates with the age and regional location of the individual (see Bondad-Brown, Rice, & Pearce, 2012; Fleegler et al., 2013; Cavanaugh, 2014; Prickett, Martin-Storey & Crosnoe, 2014; Kim, 2014; Kissner, 2015; Yang & Huesmann, 2013). These variables were included in this study because they have not been studied previously and there is empirical support for the inclusion of these variables in a study.

My intent in conducting this quantitative study was to determine the degree to which the number of news media report about an ASE influenced the casualty rates of the ensuing ASE. I also evaluated the influence that the age and location of the subsequent ASO had on that relationship. The study population consisted of all MPS occurring in the United States between April 20, 1999, and June 15, 2016, that met my operational definition of ASE. ASE were defined as a MPS in which an individual used a firearm to murder or attempt to murder people in a centralized and populated area, resulting in the murder of four or more victims by firearm (Blair & Martindale, 2013, Blair & Schweit, 2014; Kissner, 2015; Krouse & Richardson, 2015; New York City Police Department, Counterterrorism Bureau, 2012). Events that stemmed from gang or drug violence, pervasive, long-tracked, criminal acts, accidental shootings, public suicides, or did not represent a threat to the public were not categorized as ASEs (Blair & Martindale, 2013, Blair & Schweit, 2014; Kissner, 2015; Krouse & Richardson, 2015; New York City Police Department, Counterterrorism Bureau, 2012).

My literature review established the need for continuing research regarding factors that influence ASE casualty rates, including the number of news media reports about ASEs. This literature review also established the need for the inclusion of moderating variables, such as the age and location of the subsequent ASO. Although the study of MPSs is not a new area of interest among psychologists, sociologists, and criminologists (see Blair & Martindale, 2013, Blair & Schweit, 2014; Kissner, 2015; Krouse & Richardson, 2015; New York City Police Department, Counterterrorism Bureau, 2012), research regarding ASEs and the factors that influence ASOs has been

relatively ignored, per my literature review. Researchers who have examined this topic concur that there is not a single profile or set of risk factors that influences all ASOs (Clayborn & Garrison, 2015; Gamache, Platania, & Zaitchik, 2015). Influencing factors must be studied to reduce or control the number of risk factors that influence ASO and their decisions to carryout ASE (Gamache, Platania, & Zaitchik, 2015).

My goal in conducting this study was to determine if there was a relationship between the number of news media reports about an ASE and the casualty rate of the subsequent event. Social learning and social cognitive theory was used as the theoretical foundation of this study and was used to explain how media modeling, in the form of news media reporting, influences the cognition of subsequent ASOs and the casualty rates of subsequent ASEs (see Bandura, 1977, 2001; Schunk, 2012). The age and regional location of subsequent ASOs were examined as moderating variables.

The number of media reports about an ASE and the age and location of the ASO represent a small aspect of the complex interactions and circumstances that plausibly influence a ASOs' decision to carry out an ASE. However, I believe that the study of these variables is critical for evaluating the LEO theory that ASOs learn from other ASOs. Determining the degree of the relationship between these variables and the severity of ASEs may aid in the development of ASO and ASE interventions that can reduce the risk posed by ASOs and their actions.

Literature Search Strategy

An exhaustive literature review was conducted using BI by means of several libraries and databases. The terms *workplace violence, mass shooting, media and*

behavior, cognitive learning theory, active shooter, violent media, social cognitive learning theory, social learning theory, violence in the workplace, violence in the media, and mass murder were used as BIs to carry out generalized Internet searches using Google.com and Bing.com. After completing a generalized search, these BIs were used to search Open WorldCat and Walden University libraries via Google Scholar as well as PsycINFO, Sage Premier, ProQuest Criminal Justice, SocINDEX, and Lexus Nexus Academic databases. Although, initial searches were not restricted by a publication date criterion, a> 2011 criterion was used to narrow the initial results. The > 2011 criterion was used to ensure that cited resources met Walden University Dissertation Guidelines and represented current mass shooting, ASO, and ASE research within the fields of psychology, sociology, and criminology. Several key seminal works published from1971-2010 were included due to the continued relevance of the works regarding social learning and cognitive theories. Several books regarding mass murder were reviewed to gain a general understanding of the status MPS and ASE research.

Theoretical Framework

The framework of my study was based on the hypothesis that news media reports about ASEs influences individuals via vicarious and symbolic learning resulting in increased ASE casualty rates. The foundation of this hypothesis was grounded in social learning and social cognitive theory, which states that vicarious learning, learning through the observations of others and symbolic learning, learning through language, are two avenues through which individuals develop cognition, form beliefs, and obtain self-efficacy (Bandura, 1971, 2001; Helfgott, 2015; Schunk, 2012). Empirical research

pertaining to vicarious and symbolic modeling, in the form of news media reports, has shown that media is a significant vicarious and symbolic model through which individuals observe, model, and adopt behaviors (Bandura, 2001; Helfgott, 2015; Kissner, 2015; Page, Daniels, & Craig, 2015; Saul, & Fredericks, 2013; Siegert & Siegert, 2013; Schulman, 2013; van Krieken, Hoeken, & Sanders, 2015).

The vicarious influence of media on the psychology and behavior of media consumers is a well-known and exhaustively researched phenomenon that has driven the marketing industry for decades (Bandura, 2001). With the advent of video games and the increasing violent nature of a wide verity of media products, the impact of violent media on media consumers has quickly become a point of contention among researchers (Bushman & Huesmann, 2013; Bushman, Gollwitzer, & Cruz, 2015; Bushman, Jamieson, Weitz, & Romer, 2013; Elson & Ferguson, 2013; Ferguson, 2015; Ferguson et al., 2015; Markey, 2015; Markey, Males, French, & Markey, 2015). Researchers generally agree that exposure to media violence increases micro level aggression in media consumers, but that the increases in micro level aggression does not necessarily translate into violent behaviors (Bushman, Gollwitzer, & Cruz, 2015; Bushman & Huesmann, 2013). Even though the link between news media reports about violence and violent behavior is a matter of contention among researchers', violent media including movies, video games, and ASE news reports have been blamed for several ASEs over the last several decades (see Table 1).

Table 1

Sample ASEs and Influencing Media Source

		Influencing media source		
Active shooter event	Year	Video games	ASE news reports	Movie
Columbine High School	1999	Yes	Yes	No
Virginia Polytechnic Institute and State University	2007	Yes	Yes	No
Sandy Hook Elementary	2012	Yes	Yes	No
Aurora Theater	2012	No	Yes	Yes
Washington U.S. Navy Yard	2013	Yes	No	No

Note: Adapted from "A statistical analysis of violent computer games as related to violent crimes in the U.S.," by Clayborn & Garrison, 2015, *Journal of Societal and Cultural Research, 1*(2), 86-101; "Criminal behavior and the copycat effect: Literature review and theoretical framework for empirical investigation," Helfgott, J. B., 2015, *Aggression and Violent Behavior*, *22*, 46-64; "Are active shootings temporally contagious? An empirical assessment," Kissner, J., 2015, *Society for Police and Criminal Psychology.* doi:10.1007/s11896-015-9163-8; "School violence: Correlates, interventions and prevention," Page, J., Daniels, J. A., & Craig, S. J., 2015, *Violence in Schools* (pp. 1-8) Springer International Publishing; "Inside the mind of the active shooter," Siegert, M., & Siegert, B., 2013, *Security Technology Executive, 23(6), 20-23.*

Social cognitive theory explains the process by which an individual's experiences, observations, and interactions with the world around them become manifested behaviors (Bandura, 1977, 2001; Schunk, 2012). Broadly, social learning theory theorizes that individuals learn from their observations and interactions with the world through three primary mechanisms: (a) live modeling, (b) verbal instruction, and (c) symbolic modeling (Bandura, 1977). An individual's observations and interactions are adopted as a behavior when the individual: (a) pays attention, (b) can retain the information, (c) can reproduce the behavior, and (d) is motivated to do so (Bandura, 1977).

Social cognitive theory expands upon the social learning theory theorizing that learning is not a passive activity, rather, that learning is a proactive process in which an individual's beliefs and cognitions influence what an individual learns, how an individual learns, and how an individual chooses to apply acquired information (Bandura, 2001; Schunk, 2012). Social cognitive theory is a triadic reciprocal relationship consisting of three categories of simultaneous interacting influences (Schunk, 2012). The three categories of influence in social cognitive theory are: (a) cognition, beliefs, and skills, (b) behavioral, and (c) social/environmental (Schunk, 2012). When theses interacting, influences combine with a strong self-efficacy and the belief that the desired outcome is likely, learned behavior becomes manifested behavior (Bandura, 2001; Schunk, 2012). The following example illustrates how observed behavior becomes exhibited behavior based on social cognitive theory:

1. Individual A observes Individual B acting politely.
2. Individual A observes their peers treating Individual B with respect when Individual B acts politely.
3. Individual A desires the observed outcome, i.e., being respected by their peers.
4. Individual A believes they can act in the same manner as Individual B.
5. Individual A chooses to act politely because they believe they will be respected by their peers as observed.

Symbolic Learning

Symbolic learning or symbolic capability is the ability to learn based on a shared language, and/or mathematical/scientific scheme (Bandura, 2001; Schunk, 2012). Symbolic capabilities or more simply *symbols*, allow individuals to share experiences and provides a means by which individuals can contemplate their experiences and existence as well as the ability to examine the experiences of others without having to experience observed events firsthand (Bandura, 2001; Schunk, 2012). Contemplation is necessary to the learning process because it allows an individual to formulate cognitively and adopt new or varying behaviors based on first-hand experiences and socio/cultural/environmental influences (Bandura, 2001; Schunk, 2012).

Symbolic capabilities are central to an individual's ability to gather information from media sources, including television, motion pictures, the Internet, and print (Bandura, 2001; Schunk, 2012). Although, individuals are capable of learning from media sources through strict observation, symbolic capabilities allow the media consumer to ascertain additional information that would not otherwise be available to them through strict observation (Bandura, 2001; Schunk, 2012). Further, symbolic capabilities allow an individual to explore observed or learned behaviors within the context of their social environment through insightful conversations and interactions with others (Bandura, 2001; Schunk, 2012). Contextual exploration of observed or learned behaviors can improve an individual's understanding of the social/environmental consequences of an action or behavior prior to manifesting the behavior (Bandura, 1977, 2001; Schunk, 2012). Likewise, contextual exploration allows an individual to make affirmative

decisions about which learned behavior will be exhibited based upon the perceived consequences of said behavior (Bandura, 1977, 2001; Schunk, 2012). Symbolic learning capabilities are essential to understanding how individuals learn from ASOs. Few, if any, ASOs have had the opportunity to communicate with another ASO first-hand due to the death rate of ASOs (69%). Based on this fact I have theorized that any information garnered about an ASO or ASE is learned second- or third-hand.

In the aftermath of an ASE, news media reports become a primary source of information due to the vast amount media attention media given to these events (Cavanaugh, 2014; Garcia-Bernardo et al., 2015). Due to the vast amount of information that is available about ASEs and ASO through news media reporting (symbolic learning), the symbolic learning capabilities of potential ASOs influences their ability to gather and comprehend information about these events (see Bandura, 1977, 2001; Chesbro, 2012; Helfgott, 2015; Kissner, 2012; Schunk, 2012; van Krieken, Hoeken, & Sanders, 2015). If an ASO has limited symbolic capabilities, then their ability to learn symbolically via language and in turn accurately interpret information will result in a degraded ability to learn from news media reports (Bandura, 1977, 2001; Schunk, 2012).

Vicarious Learning

Vicarious learning is learning through the observation of a third party's behavior and the consequence or outcomes of those behaviors (Bandura, 1977). Of the three primary avenues of learning described by Bandura (1977), live modeling is the most common. Within the social cognitive construct, live modeling is referred to as vicarious learning and reflects a similar learning process (Bandura, 1977, 2001; Schunk, 2012).

Vicarious leaning, like, symbolic learning, is important to the human development because it allows an individual to learn by observing without having to experience the consequences of an action first-hand (Bandura, 2001; Schunk, 2012). As an example, if Child A observes Child B touching a hot iron and being burned and Child A was unable to modify their behavior based on the observation of the consequences of Child B's behaviors, Child A would need to touch the iron and be burned to learn that a hot iron causes burns when touched.

The relationship between the observation of behavior and the manifestation of that behavior is not causational (Bandura, 2001; Schunk, 2012). As with symbolic learning, an individual's perception of the consequences of a vicariously observed behavior must be positive and the individual must choose to manifest the behavior before the behavior is exhibited (Bandura, 2001; Schunk, 2012). Once a positively perceived consequence has been observed an individual must be: (a) able to retain the observed behavior, (b) able to reproduce the behavior, and (c) motivated to adopt the behavior, before the individual can behave in the observed manner (Bandura, 2001; Schunk, 2012). Toward this end, a vicarious model serves several purposes. First, vicarious models allow an individual to observe consequences of behavior without having to experience the consequences first-hand (Bandura, 2001; Schunk, 2012). Second, vicarious models represent a mark against which an individual's self-efficacy can be measured, i.e., "We are alike, if X can do it then I can" (Bandura, 2001). Third, vicarious models allow for the creation of goals, i.e., "I will do better than X" (Bandura, 2001).

News media reports provide media consumers with a wide variety of vicarious models. In a modern technological society made up of a vast array of individuals, vicarious models provided by media sources are exerting a larger influence on media consumers than ever before (Cavanaugh, 2014; Fox, & Levin, 2015; Garcia-Bernardo, 2015). As theorized with the Columbine High School, VPI and State University, and the Sandy Hook Elementary School ASOs, if an individual lacks strong social connections, vicarious models may begin to replace live models at a greater rate than would otherwise be expected (Clayborn & Garrison, 2015; Helfgott, 2015; Kissner, 2015; Page, Daniels & Craig, 2015; Saul & Fredericks, 2013; Siegert & Siegert, 2013). The replacement of live models with vicarious models can negatively affect an individual's perception of consequences because vicarious consequences can be improperly perceived without proper social context (Bandura, 2001; Cavanaugh, 2014; Schunk, 2012). Further, because learning within the social cognitive construct is a proactive endeavor, individuals lacking a connection to society or the community are less likely to be exposed to models and consequences that are averse to their current cognition hindering their ability to think critically or introspectively (Bandura, 2001; Schunk, 2012). In other words, an individual in a closed or isolated environment, with access to the media, can seek out vicarious models that reflect or support their existing cognition. If this isolated individual perceives ASOs as heroes and the consequences of their actions as positive, there is little chance of the individual encountering live or vicarious models that reflect societal and contextual norms that might cause introspective growth (Bandura, 1977; Bandura, 2001; Schunk, 2012).

Violent Mass Media and Aggression

The impact of ASE news media reports is not limited to the value of the information contained within the reports. Due to the violent nature of ASE news media reports I theorized that the reports themselves may influence or magnify aggression level among potential ASOs. One of the most highly debated questions among mass media and aggression researchers is whether or not exposure to violent media including, but not limited to: (a) movies, (b) video games, (c) Internet posts, (d) news media reports, (e) social media, and (f) television, influences aggression levels in consumers (Bonus, Peebles, & Riddle, 2015; Bushman & Anderson, 2014; Bushman & Huesmann, 2013; Bushman, Gollwitzer, & Cruz, 2015; Elson & Ferguson, 2013; Ferguson, 2015; Ferguson et al., 2015; Garcia-Bernardo et al., 2015; Helfgott, 2015; Markey, 2015; Markey et al., 2015).

Although, there is empirical support for the theorized contention between violent mass media an aggression, the result of such research has given rise to three generally supported theories, rather than a single universally supported theory (see Bushman et al., 2013; Bushman & Anderson, 2014; Elson & Ferguson, 2013). Studies such as those conducted by Bushman et al. (2013) represent the first theory; exposure to violent mass media increases micro levels of aggression in the media consumers. The second theory; exposure to violent mass media may/does increase micro levels of aggression in media consumers however, increases in micro level aggression does not translate into an increase in violent behavior is supported by studies conducted by Elson and Ferguson (2013), Ferguson (2015), Ferguson et al. (2015), Markey (2015), and Markey et al.

(2015). The remaining theory, which is supported by research conducted by Bushman and Anderson (2014); Bushman, Gollwitzer, and Cruz (2015), states that violent mass media can increase aggression levels in media consumers but there is not enough evidence to support a causational or correlation relationship between increased levels of aggression and violent behavior. Regardless of the nature of the connection between violent mass media and aggression, violent mass media cannot be ignored as a risk factor that influences violent behavior (see Table 2).

Table 2

Violent Media Exposure and Aggression Theories

Theory	Increases micro level aggression	Correlational/causational relationship	Increases violent behavior
1	Yes	No	No
2	Possible	No	No
3	Possible	Unknown	Unknown

The fact that there is not a strong empirical link between violent media exposure and violent behavior did not dissuade me from including violent media exposure as a variable in this study. The key arguments for including violent media exposures, by way of news media reporting rates were as follows:

- Aggressive or violent individuals are drawn to violent media (Elson & Ferguson, 2013; Fox & DeLateur, 2013).
- Exposure to violent media increases micro level aggression and felt aggression (Bushman & Gollwitzer, & Cruz, 2014)

- Increases in aggression, in an already aggressive individual, could potentially act as a catalyst resulting in violent behavior (Bonus, Peebles, & Riddle, 2015; Siegert & Siegert, 2013)

Based on this reasoning, I theorized that news media reports about ASEs provide potential ASOs with information about effective modus operandis, while at the same time increasing micro level and/or felt aggression in individuals that are already aggressive and/or violent by nature, resulting in the execution of an ASE.

Symbolic, Vicarious Learning and Behavioral Outcomes

As previously stated, there is not a causational relationship between the observation of a behavior and the manifestation of that behavior. For an individual to learn and manifest a behavior an individual must be able to: (a) pay attention to the model, (b) retain the observed behavior, (c) reproduce the behavior, and (d) be motivated to adopt the behavior (Bandura, 2001; Schunk, 2012). Due to the proactive nature of social cognitive theory, what a person is interested in and motivated to learn about is influenced by the individual's cognitions and beliefs (Bandura, 1977; Bandura, 2001; Schunk, 2012). If an individual is interested in the information and motivated to learn about it, they are more likely to retain it, barring any mental or cognitive barriers that would affect retention (Bandura, 1977; Bandura, 2001; Schunk, 2012). Beyond cognitive ability, an individual's ability to reproduce a behavior involves a broad array of influencing factors including but not limited to: (a) economic resources, (b) physical ability, (c) self-efficacy, (d) mobility, and (e) age. Once an individual is able retain and

reproduce a learned behavior the behavior remains dormant until the individual is motivated to act in the prescribed manner (Bandura, 1977; Schunk, 2012).

Within the social cognitive construct, the primary motivators to manifest a behavior are the belief that one can act in the prescribed manner and the desire to ascertain a similar outcome or reward as observed in the model (Bandura, 1977; Bandura, 2001; Schunk, 2012). When considering the reward or outcome aspect of behavioral motivation, the value of the reward or the outcome is not solely measured by social norms or social/cultural response (Bandura, 1977: Schunk, 2012. Rather, the actor determines the value of the reward based their cognition and known social context (Bandura, 1977: Schunk, 2012). In other words, an individual's values drive their choices of where, what, and how to learn, while their expectations of themselves and the outcomes of their behavior drives the actual manifestation of the behavior (Schunk, 2012). If an individual does not value the information, then they will not learn it. If an individual does not believe they can be successful or they do not value the observed outcome, then they are unlikely to act in an observed manner (Bandura, 1977; Bandura, 2001; Schunk, 2012).

In the field of mass murder research, the process of symbolic and vicarious learning is known as the copycat effect. The copycat effect is the recreation of a criminal act using a modus operandi learned through symbolic and vicarious observation of previous offenders (Bandura, 1977, 2001; Chadee, Surette, Chadee, & Brewster, 2015; Helfgott, 2015; Schunk, 2012). The copycat effect theory has been used by ASE researchers to explain the obsession of ASOs, such as Harris and Klebold, Cho, and

Lanza, with previous mass murderers as well as the similarity in ASE modus operandi from ASE to ASE (Helfgott, 2015; Kissner, 2015; Page, Daniels, & Craig, 2015; Schulman, 2013; Saul & Fredericks, 2013; Siegert & Siegert, 2013). Based on my evaluation of Bandura's (1977, 2001), Schunk's (2012) research and mass murder research generally, the term copycat effect does not describe a unique criminal learning process, rather the term describes the process of learning and manifesting criminal behavior through symbolic and/or vicarious learning as described by social cognitive construct.

In summary, symbolic and vicarious learning, within the social cognitive framework, as it relates to ASOs and ASEs is explained in the following manner.

1. Individual A becomes interested in a previous ASO or ASE.
2. That interest motivates Individual A to seek out information regarding the previous ASO or ASE.
3. Individual A can retain information observed vicariously or symbolically via news media models.
4. Individual A perceives the observed outcome positively (fame, revenge, control, etc.) based on Individual A's cognition, beliefs and known social context.
5. The observed outcome motivates Individual A until their level of self-efficacy reaches a point where Individual A is confident in their ability to act and achieve a similar outcome as the one previously observed.
6. Individual A decides to manifest observed behavior.

7. Individual A manifest observed behavior.

When symbolic and vicarious learning occurs in this manner, it is called the copycat effect. Further, due to the violent nature of the learned behavior, the learned behavior increases Individual A's level of aggression that in turn may motivate Individual A to act out violently.

Key Variables and Concepts

This study contained several key variables and concepts that were critical to the design of the study as well as interpretation of the data set and the results. The key concepts and variables inculcated in this study are framed in the following questions.

1. How is firearm accessibility impacted by age and regional location?
2. How are news media consumers impacted by news media reporting rates?
3. How does the definition of an ASE impact the statistical analysis of ASEs?

Firearm Accessibility

The homicide rate in the United States is six times higher than other high-income countries, and the likelihood of that homicide being committed with firearm is 20 times higher than in similar countries (Webster & Wintemute, 2015). In the United States firearms are the second-leading cause of death among all age groups, second only to automobile accidents (Hodges & Scalora, 2015; Weinberger, et al., 2015). Toward this end, when a MPS or ASE occurs in the United States firearm control legislation becomes a topic of concern amongst community members, legislators, media outlets, and researchers (Blau, Gorry, & Wade, 2016; Hodges & Scalora, 2015; Krouse & Richardson, 2015; Metzl & MacLeish, 2015; Webster & Wintemute, 2015; Weinberger,

et al., 2015). However, when the MPS or ASE occurs in an educational environment such as the ASE carried out at Columbine High School, VPI and State University, and Sandy Hook Elementary the amount of attention given to the event and to firearm control legislation is magnified (Cavanaugh, 2014; Cornell, 2015; Hodges & Scalora, 2015). This fact along with the necessity of a firearm to commit an ASE makes firearms accessibility a prominent concern of ASE researchers.

Firearm accessibility is an ASE risk factor because an ASO must have access to a firearm, the ability to use said firearm to cause casualties, and must use that firearm to commit a MPS or ASE (see Blair & Martindale, 2013; Blair & Schweit, 2014; Blau, Gorry, & Wade, 2016; Gamache, Platania, & Zaitchik, 2015; Nekvasil, Cornell, & Huang, 2015; New York City Police Department, Counterterrorism Bureau, 2012). Although, there many different types of firearm control legislation, firearm control laws that focused on, age prohibitions, and accessibility, were the primary reasons for theorizing that firearm control legislation impacts firearm accessibility and in turn an individual's ability to execute an ASE (Blau, Gorry, & Wade, 2016; Fleegler et al., 2013; Gius, 2015; Hodges & Scalora, 2015; Prickett, Martin-Storey, & Crosnoe, 2014; Webster & Wintemute, 2015).

Age

In the United States, the age at which an individual can legally possess a handgun or a long gun, as well as the age at which an individual can legally purchase a handgun or a long gun, varies from state to state (Gius, 2015; Webster & Wintemute, 2015). Under federal law an individual must be at least 18-years-of-age to possess a handgun or

purchase a handgun from a private seller and 21-years-of-age to purchase a handgun from a federally licensed firearms dealer (Gius, 2015; Webster & Wintemute, 2015). There are no federal laws defining a minimum age at which an individual can possess a long gun (Gius, 2015; Webster & Wintemute, 2015). Although, federal and state legislators have attempted to limit adolescent access to firearms by enacting handgun purchasing and possession laws that reduce access based on age, Webster and Wintemute (2015) report that these forms of firearm control legislation were not an "associated risk factor for firearm-related homicide and suicides among individuals under the age of 21 between 1979 and 1998" (p. 25).

In addition to limiting the legal age at which a person can possess or purchase a firearm, 18 states have enacted Child Access Prevention (CAP) laws, which legislate firearm storage practices and hold adults criminally liable if an adolescent possesses a firearm without proper supervision (Prickett, Martin-Storey, & Crosnoe, 2014). The stated goal of CAP laws is to reduce the number of injuries and deaths caused by accidental shooting(s) and to reduce the number of crimes carried out by adolescents with firearms, including ASEs (Fleegler et al., 2013; Prickett, Martin-Storey, & Crosnoe, 2014). Although, CAP laws encourage proactive firearm storage behaviors, CAP laws have been shown to be most effective when combined with restrictive firearm control legislation (Prickett, Martin-Storey, & Crosnoe, 2014). However, researchers have yet to document a cause-and-effect relationship between stronger firearm control legislation, including age restricted possession/purchase and CAP laws, and a lower rate of firearm suicides and homicides (Fleegler et al., 2013; Prickett, Martin-Storey, & Crosnoe, 2014).

Another aspect of age that is rarely addressed by researchers in ASE, mass shooting, or gun violence studies is the degree to which age or maturity influences an individual's ability to use a firearm and apply firearm tactics effectively. Being able to operate a firearm in an efficient manner requires physical and cognitive ability, both of which increase through adolescence and adulthood and then decline in older age. Further, with age comes the economic freedom necessary to learn firsthand how to operate a firearm and to apply firearm tactics judiciously. Even when firsthand experiences with firearms are not plausible due to an individual's age or other factors, an individual's ability to learn vicariously through such mediums as first-person shooter video games or online tutorials, and their ability to apply learned behaviors is influenced by their level of cognitive functioning (Bandura, 1977; Bandura, 2001). These combined factors may explain why the median age of mass public shooters is 34-years-of-age rather than 16 or 70-years-of-age (see Figure 4).

Besides affecting firearm accessibility as previously discussed, age was also found to correlate with the location of an ASE as well as the location, and the size of the ASE in two studies respectively (Garcia-Bernardo et al., 2015; New York City Police Department, Counterterrorism Bureau, 2012). The New York Police Department, Counterterrorism Bureau (2012) found a correlation between age and the location of ASEs. ASEs occurring in schools were generally carried out by ASOs between 15-19-years-of-age while 35-44-year-old ASOs were generally responsible for non-school ASEs (New York City Police Department, Counterterrorism Bureau, 2012). Garcia-Bernardo et al. (2015) found a positive relationship between age and the size of ASEs carried out in

schools. The older the ASO, the larger the school shooting was (Garcia-Bernardo et al., 2015). Overall these factors highlight the influence that age has on firearm accessibility, firearms skills, and location(s), making age a viable moderating variable for inclusion in this study (Garcia-Bernardo et al., 2015).

Firearms Legislation

Federal legislation sets the minimum level of firearm control in the United States. Outside of age prohibitions, federal legislators have enacted laws to ensure that prohibited individuals such as those that: (a) suffer from a mental defect, (b) have been convicted of a felony or are currently indicted for a felony, (c) have been convicted of domestic violence or are indicted for domestic violence, (d) are not currently a United States citizen or have renounced their citizenship, are not legally authorized to purchase or possess a firearm (Metzl & MacLeish, 2015; U.S. Attorney's Office, District of Utah , 2013; Webster & Wintemute, 2015). Federal legislators have also enacted baseline laws that limit the type of firearms and firearm accessories that can be legally purchased or possessed without additional licensing/permitting (U.S. Bureau of Alcohol, Tobacco, Firearms, and Explosives, 2015). Restricted firearms and firearms accessories include: (a) fully-automatic firearms, (b) long guns with a barrel shorter than 18-inches, and (c) suppressors. Many states have also passed firearm control legislation that restricts magazine capacity as well (U.S. Bureau of Alcohol, Tobacco, Firearms, and Explosives, 2015; Kalesan, Mobily, Keiser, Fagan, & Galea, 2015Webster & Wintemute, 2015). In addition to the federal firearm control laws, most states have taken the additional step of passing legislation that requires additional licensing/permitting to sell, purchase, or carry

firearms (Kalesan et al., 2015; Lott, 2010; Webster & Wintemute, 2015). These laws include, but are not limited to: (a) Permit-to-Purchase (PTP), (b) concealed carry, (c) firearms dealer laws including licensing, records keeping, and auditing, (d) bulk purchase limitation, (f) and Gun Show Loophole laws (Blau, Gorry, & Wade, 2016; Kalesan et al., 2015; Lott, 2010; Webster & Wintemute, 2015).

The strength of federal firearm control legislation is consistent throughout the United States however, the strength of state-level firearm control legislation varies from state to state based on the number and type of firearm control laws that are in place at any given time (Blau, Gorry, & Wade, 2016; Fleegler et al., 2013; Kalesan et al., 2015; Lott, 2010; Webster & Wintemute, 2015). The Brady Campaign to Prevent Gun Violence and the Brady Center to Prevent Gun Violence has created a process for measuring the strength of state-level firearms control legislation that is commonly used by researchers (Fleegler et al., 2013; Kalesan et al., 2015). To measure state-level gun control legislation the Brady Campaign to Prevent Gun Violence and the Brady Center to Prevent Gun Violence divides state-level firearm control legislation into five categories and assigns each category a point value based on the likely impact the law will have on firearm violence (Fleegler et al., 2013; Kalesan et al., 2015). The five firearm control legislation categories created by the Brady Campaign to Prevent Gun Violence and the Brady Center to Prevent Gun Violence are: (a) legislation that hinders firearm trafficking, (b) legislation that strengthens background checks for firearm purchases beyond current federal regulations, (c) legislation that protects children, (d) legislation that bans assault weapons, and (e) legislation that restricts firearms in public places (Fleegler et al., 2013;

Kalesan et al., 2015). The points awarded to each state are then tallied to create an overall score (Fleegler et al., 2013). The higher the total score, the stronger the state's firearm control legislation is (Fleegler et al., 2013).

Using the Brady Campaign to Prevent Gun Violence and the Brady Center to Prevent Gun Violence categorization criterion Kalesan, et al. (2015) found that there were nine firearm control laws that were effective, nine firearm control laws that were ineffective, and seven firearm control laws that inconclusively reduced firearm-related mortality. The three firearm control laws that were most effective at reducing homicides identified by Kalesan et al. (2015) were: (a) universal background checks for firearm purchases, (b) background checks for the purchase of ammunition, and (c) identification requirements for firearms. Identification requirements for firearm legislation also correlated with a reduction in suicides (Kalesan, 2015).

In a similar study, Fleegler et al. (2013) used a variation of the Brady Campaign to Prevent Gun Violence and the Brady Center to Prevent Gun Violence categorization criterion to test the hypothesis that the strength of state level firearm control legislation correlated with firearm mortality rates. The results of the Fleeger et al. (2013) study revealed that there was a correlation between state-level firearm control legislation and firearm mortality rates when states were grouped together by firearm control legislation strength scores. Although, the Fleegler et al. (2013) and Kalesan et al. (2015) studies found evidence to support a correlation between state level firearm control legislation and suicide/homicide rates, there is little consensus among researchers as to whether this correlation is accurate or due to variations in methodology and data sets from study to

study (Lott, 2010). As an example, in the Fleegler et al. (2013) study, which studied firearm deaths and firearm control legislation between 2007 and 2010, a correlation between state level firearm control legislation and suicide/homicide rates was discovered only after states were placed in quartiles based on the state's cumulative score. The quartiles in the Fleeggler et al. (2013) study were as followed: (a) quartile 1 consists of scores from 0-2, (b) quartile 2 consists of scores from 3-4, (c) quartile 3 consists of scores from 5-8, and (d) quartile 4 consists of scores from 9-24.

When the quartiles are disregarded and states are compared individually the cited correlation is less apparent. As an example, Hawaii, which had the sixth highest (median legislative strength score of 16) firearm control legislation score nationally, had a homicide rate (0.7 per 100,000) 2.4 times lower than Massachusetts (1.7 per 100,000), which had the highest (median legislative strength score of 22.5) firearm control legislation score (Fleeger et al., 2013). Further, Maryland tied with Hawaii with a firearm control legislation score of 16 however, Maryland's homicide rate was 4.41 times higher (6.3 per 100,000) than Hawaii. In the Fleeger et al. (2013) study the use of quartiles may have impacted the results of the study due to the larger range of scores included in quartile 4 and the comparatively smaller score ranges in quartiles 1, 2, and 3.

In addition to measuring the overall strength of state-level firearm control legislation, the Fleeger et al. (2013) study provided a means of evaluating the general strength of firearm control legislation in states where ASEs have occurred. Using the five deadliest ASEs in the United States between 1999 and 2013, Columbine High School (36 victims), the first Fort Hood shooting (45 victims), VPI and State University (49 victims),

the Aurora Theater Shooting (70 victims), and Sandy Hook Elementary School shooting (28 victims) as examples, the median firearm control legislation scores during these events can be determined (see Fleeger et al. 2013). In addition, the Fleeger et al. (2013) study can also be used to determine the annual homicide rate per 100,000 (see Table 3)

Table 3

State Firearm Control Legislation Rank, Median Score, Homicide Rate, and ASE Casualty Rate

State/ASE	Year	Rank	Median score*	Homicide rate**	ASE casualty rate ***
Colorado, Columbine High School	1999	20th	5	2.1	36
Virginia, Virginia Polytechnic Institute and State University	2007	15th	8	3.4	49
Texas Fort Hood	2009	35th	3	3.9	45
Colorado, Aurora Theater	2012	20th	5	2.1	70
Connecticut, Sandy Hook Elementary School	2012	4th	20	2.5	29

Note: Adapted from: "Firearm legislation and firearm-related fatalities in the United States," by Fleegler, E., Lee, L., Monuteaux, M., Hemenway, D., & Mannix, R., 2013. *JAMA Internal Medicine, 173*(9), 732-740. doi:10.1001/jamainternmed.2013.1286 and "A Study of Active Shooter Incidents in the United States Between 2000 and 2013," by Blair, P., & Schweit, K., 2014, *Texas State University and Federal Bureau of Investigation*, U.S. Department of Justice, Washington D.C. 2014.
*Median Firearm Legislative Strength Score, 2007-2010.
**Homicide rate per 100,000, 2007-2010
*** Casualty rate is the number of people murdered or injured, 2007-2010

Although the Fleeger et al. (2013) study does not provide a firearm legislative strength score for the specific year in which the Columbine High School, Fort Hood, and Sandy Hook Elementary School ASEs occurred, the study does provide a benchmark for determining the firearm legislative strength score for Colorado in 1999, and for Texas and Connecticut in 2012. Since firearm control legislation is often passed after an ASE the actual firearm legislative strength scores prior to 2007 are likely to be equal to or lower than the 2007-2010 median firearm legislative strength score (see Hodges & Scalora, 2015; Krouse & Richardson, 2015; Metzl & MacLeish, 2015; Webster & Wintemute, 2015; Weinberger, et al., 2015). Based on this assumption, the 2007-2010 median firearm legislative scores can be used to draw comparisons for ASE that occurred prior to 2007.

The 2007-2010 median firearm legislative strength scores are just as likely to reflect the 2012 state firearm legislative strength scores due to the proximity of the dates in question. There is also the possibility that the 2012 firearm legislative strength scores might be slightly higher than the 2007-2010 median firearm legislative strength score due to the passage of firearm legislation in reaction to ASEs that occurred throughout the country between 2010 -2012. However, with 40 states achieving a 2007-2010 median firearm legislative strength score of < 10 any likely changes (+) or (-) to the 2007-2010 median firearm legislative strength score would be unlikely to change the results of the assumptions made about firearm legislative strength scores occurring prior to 2007 or after 2010.

When evaluating the data in the Blair and Schweit (2014) and the Fleeger et al. (2013) studies I discovered that between 1999 and 2013 at least one of the country's top five casualty producing ASEs occurred in states that ranked at both ends of the firearm control legislative strength spectrum; Connecticut at 4th and Texas at 35th. Of the three-remaining ASEs, two occurred in Colorado which ranked 20th overall (Blair & Schweit, 2014; Fleegler et al., 2013). It is also important to note that four of the top five casualty producing ASEs occurred in states which had a median legislative strength score of < 9 out of a possible score of 24, with Connecticut (median score of 20) being the only exception (Blair & Schweit, 2014; Fleegler et al., 2013). The fact that four of the top five casualty producing ASEs occurred in states with firearm control legislation strength scores well below the 50th percentile lends support to my hypotheses that there is a correlation between firearm control legislation and ASE casualty rates.

Regional Location

Due to variations in firearm control legislation nationally and the necessity of a firearm to perpetrate an ASE, the location of an ASE, as it relates to firearm control legislation, cannot be overlooked as an influencing factor. When considering location as it pertains to the impact of firearm control legislation as a variable, it is important to look beyond the state in which the ASE occurred and to consider the regional location as well (Webster & Wintemute, 2015). In the study, *Effect of Policies Designed to Keep Firearms from High-Risk Individuals* Webster and Wintemute (2015) determined that approximately 70% of firearm crimes were committed with firearms purchased in the states where they were used to commit a crime, resulting in the hypotheses that stronger

firearm control legislation would reduce the number of firearm crimes. However, when firearm crimes are viewed at the regional level rather than the state level, the effectiveness of a state's firearm control legislation is undermined by the strength of firearm control legislation of surrounding states (Webster & Wintemute, 2015). Specifically, the rate of illegal firearm importation from states with less restrictive firearm control legislation increases when a state with more restrictive firearm control legislation is in proximity to states with less restrictive firearm control legislation (Webster & Wintemute, 2015). Towards that end, Webster and Wintemute (2015) found that increased illegal firearms importation into states with more restrictive firearm control legislation correlated with an increased number of armed robberies in the destination state. Webster and Wintenute (2015) theorized that this correlation is the result of supply and demand economics. Since regional firearm control legislation has a stronger correlation to firearm crime rates than state-level firearm control legislation, the regional location of a firearm crime must be considered when evaluating the relationship between rate of firearm crimes and firearms control legislation (Blau, Gorry, & Wade, 2016; Webster & Wintemute, 2015).

Media Reporting

There are two major categories of media sources in the United States, print and electronic. Print sources include newspapers, magazines, and books. The most common forms of electronic media include the Internet, social media, television, and motion pictures. Although, print and electronic formats are considered separate sources, many print formats including newspapers, magazines, and books are generally available to

consumers in an electronic format as well. Kim (2014) conducted a cross-platform media use behavior study to determine how individuals access media sources. The general finding of the Kim (2014) study was that media consumers select media platforms based on their needs. The most commonly used sources of news media are newspapers, television, and the Internet (Kim, 2014). Older individuals use television and newspapers more often than the Internet, while younger individuals tended to use the Internet more than television and newspapers (Kim, 2014).

As with other forms of media, news reports regarding violent events do not cause a person to act violently, however, news media reports about violent events may act as a catalyst or a trigger that influences an individual's decision to act out violently (Elson & Ferguson, 2013; Ferguson, 2015; Ferguson et al., 2015; Markey et al, 2015). Due to similar concerns the Center for Disease Control (CDC) in conjunction with National Institute of Mental Health, the Office of the Surgeon General, the Substance Abuse and Mental Health Services Administration, the American Foundation for Suicide Prevention, the American Association of Suicidology, and the Annenberg Public Policy Center collaborated with the World Health Organization, the National Swedish Centre for Suicide Research, and the New Zealand Youth Suicide Prevention Strategy produced a set of recommendations titled *Reporting on Suicide: Recommendations for the Media* (Center for Disease Control and Prevention, n.d.; Schulman, 2013). The recommendations report was created to curb copycat suicides after changes in media reporting strategies about Vienna subway train suicides in 1987 resulted in an 80% reduction in subway train suicides and suicide attempts in the first six months (Center for

Disease Control and Prevention, n.d.). Further, Garcia-Bernardo et al. (2015) found a correlation between the likelihood of a subsequent school-based ASE and the number of tweets posted about a school-based ASE. The probability of an attack within the next week doubled when the number of school-based ASE tweets increased from 10 to 50 million (Garcia-Bernardo et al., 2015). The Garcia-Bernardo et al. (2015) study and the correlation between rate/type of news reporting about subway train suicides and subway train suicide rates supports the hypotheses that the rate of news media reporting about ASEs may correlate with some aspect of ASEs including but not limited to the copycat effect, regularity of events, or casualty rate of subsequent events.

Primarily, ASE news media reports allow the public to learn and form opinions about ASEs. Further, media outlets can influence the thoughts of the media consumer based on the information that a media outlet includes or excludes from a report (Cavanaugh, 2014). As an example, news media outlets often report that workplace ASE are carried out by disgruntled ASOs who were seeking revenge on their employer (Denenberg & Denenberg, 2012). The disgruntled worker theme became the stereotypical motivation of the workplace shooter in the minds of the public based on the media's reinforcement of the stereotype whether the stereotype proved to be factual or not (Denenberg & Denenberg, 2012). Similarly, after a rash of mass shootings in postal facilities the term *going postal* became a household term used to describe any workplace shooters whether the shooting occurred in a postal facility or not (Denenberg & Denenberg, 2012). Interestingly, almost every postal shooting ASO was described as

being disgruntled by news media outlets, further reinforcing the disgruntled worker stereotype (Denenberg & Denenberg, 2012).

A retrospective review of ASEs reveals a correlation between news media reporting about ASEs and an increase in public demand for stronger firearm control legislation (Cavanaugh, 2014). Causation between these variables has not been proven and could be inversely correlated, i.e. public opinion related demand for stronger firearm control legislation may cause an increase in the number of media stories related to the topic based on supply and demand principles. However, the attention afforded to a story by media outlets cannot be disregarded as simply public demand and further supports that theory that ASE news media reports influence the way people think in the same manner as other news media reports (Cavanaugh, 2014).

Beyond informing the public about an event, ASE news media reports serve a secondary purpose; the communication of the ASO's message to the public (Helfgott, 2015; Schulman, 2013). As an example, in the VPI and State University shooting, Cho mailed a videotape and manifesto to NBC News containing his reasoning for carrying out the shooting (Siegert & Siegert, 2013). Cho's message was then communicated to the public by the news outlet. Although, Cho took specific steps to relay his message to the media, such steps were not necessary. Based on current news media reporting trends an ASO can be assured that their actions will receive media attention and that any information left behind by the them including journals, blogs, and other material will be examined and shared with the public (Saul & Fredericks, 2013; Schulman, 2013; Siegert & Siegert, 2013).

In summary, my review of the literature has determined that news media reports are the most common form of media that individuals use to learn about ASEs. Younger consumers use the Internet to locate news media reports while older consumers tend to seek out information from television news and newspapers (Kim, 2014). More specifically my review of the literature revealed:

- Changes in news media reporting practices about suicides reduced the number of suicides in Vienna, Italy, in 1987 (Center for Disease Control and Prevention, n.d.).
- Social media posts about school based ASEs, specifically Twitter tweets, correlate with the likelihood of subsequent school-based ASEs over a given period (Garcia-Bernardo et al., 2015).
- Some ASOs are obsessed with the actions of previous ASEs (Siegert & Seigert, 2013).
- Some ASOs learn about previous ASEs from news media reports (Siegert & Seigert, 2013).
- Media outlets communicate an ASO's message to the public whether that message is communicated to the media outlet proactively or passively (Helfgott, 2015).
- To date, researchers have failed to evaluate the relationship between the number of news media reports about an ASE and the casualty rates of subsequent ASEs (Cavanaugh, 2014; Kissner, 2015).

Active Shooter Events

Researchers commonly divide mass murders into four subcategories: (a) serial murders, (b) gang-related homicides, (c) family annihilators, and (d) spree killers (Fox & DeLateur, 2013; Schulman, 2013). Schulman (2013), Blair and Martindale (2013), Blair and Schweit (2014), the Crime Prevention Research Center (2014), and the New York City Police Department, Counterterrorism Bureau, (2012) argue that ASEs represent an additional unique subcategory of mass murder, while Everytown for Gun Safety (2014) and Fox and DeLateur (2013) group ASEs with other forms of mass shootings. Based on the Everytown for Gun Safety (2014) and Fox and DeLateur (2013) approach to mass shooting categorization the term ASE is unnecessarily confusing because it includes some mass shooting subcategories (workplace, public, and school) while excluding others (mass shooting resulting from other criminal activity and family annihilators by firearms) and therefore, does not accurately characterize mass shootings.

To clarify the issue of mass shooting categorization Krouse and Richardson (2015) used the term MPS to categorize shootings where four or more individuals are murdered in public locations such as workplaces, schools, restaurants, houses of worship, and neighborhoods. Krouse and Richardson (2015) adopted the term MPS to clarify the nature of the specific events they were studying by using terms and criterion like those used by the FBI when studying mass murder. Although, the term ASE has not been universally adopted by researchers, researchers have not been able to ignore the term due to the terms adoption by the media, law enforcement, and greater American society. However, the term ASE must be clearly defined in a manner that aligns with current data

collection methodology and research terminology to ensure study validity and to avoid the confusion created by the terms inclusion or exclusion by previous researchers.

The term ASE is generally used by researchers, law enforcement, and the media to describe an event in which an individual or individuals is actively engaged in killing or attempting to kill people in a populated area (Blair & Martindale, 2013; Blair & Schweit, 2014; New York City Police Department, Counterterrorism Bureau, 2012). As reflected in the Blair and Schweit (2014) FBI report titled *A Study of Active Shooter Incidents in the United States Between 2000 and 2013* shooting events that stem from gang or drug violence, pervasive, long-tracked, criminal acts, accidental shootings, public suicides, and shootings that did not represent a threat to the public should not be categorized as an ASE. Although, events that could be categorized as ASEs have been occurring for decades, the term Active Shooter or active shooter event (ASE) did not exist prior to 2001 (Blair & Martindale, 2013; Blair & Schweit, 2014; Gamache, Platania, & Zaitchik, 2015; New York City Police Department, Counterterrorism Bureau, 2012). The intense scrutiny focused on the response of law enforcement to MPSs following the 1999 Columbine High School mass shooting led to the creation and popularization of the terms active shooter and ASE. These new categories of mass murder created a new area of research that was previously studied as part of the larger mass murder phenomenon (Blair & Martindale, 2013; Gamache, Platania, & Zaitchik, 2015; Police Executive Research, 2014).

The term active shooter or ASE is commonly used by news media and the public to describe events that would otherwise be categorized as MPSs. In all actuality, the term

active shooter or ASE more accurately describes the tactics used by law enforcement and emergency services when responding to an incident that is believed to be MPS at the time of dispatch. Due to the popularity of the term active shooter or ASE the term has been adopted by the researchers, media, law enforcement, and greater American society as an umbrella term that describes a category of mass murder that includes, MPSs, workplace shootings, and school shootings (Blair & Martindale, 2013; Blair & Schweit, 2014; Gamache, Platania, & Zaitchik, 2015; New York City Police Department, Counterterrorism Bureau, 2012; Police Executive Research, 2014). Even though, the term active shooter or ASE has been universally adopted as an umbrella term, the definition of the terms is not universal and varies from situation to situation and study to study.

A review of the current literature regarding the regularity and severity of ASEs reveals conflicting results that appear to be caused by differences in study methodology. Specifically, there are three aspects of the commonly applied methodologies that directly impact the results of an ASE study: (a) the way events are categorized, (b) the operational definition of an ASE, and (c) the sample size.

If an ASE is not categorized as a unique event and is instead grouped together with other types of mass murder, the sample size is dramatically increased (Fox & DeLateur, 2013; Nekvasil, Cornell, & Huang, 2015). The inclusion of family annihilators in mass murder studies is an excellent example of the magnifying effect that the grouping all mass murders together can cause. For instance, between 2005 and 2010 events in which two or more people were killed occurred in residences approximately 50% of the time as compared to less than 1% of the time in schools (Cornell, 2015; Nekvasil,

Cornell, & Huang, 2015). Further, between 1999 and 2013, there were 127 cases of family annihilations by firearms compared to 66 MPSs, inferring that family annihilators represent a greater threat to public safety than ASOs (Krouse & Richardson, 2015). However, researchers theorize that ASEs garner more public attention than family annihilators because individuals believe they are more likely to be killed by a stranger then a family member even though family annihilation occurs almost twice as often as MPSs (Krouse & Richardson, 2015).

The inclusion and exclusion criterion used to define ASEs is the next aspect of ASE research methodology that impacts the results of ASE studies. When developing an operational definition of an ASE, the two most commonly used and conflicting criterion are casualty rate and event typology. As of 2010, the FBI defined a mass shooting as an event in which four or more people are murdered by firearm; while Congress has defined mass killings as events in which three or more individuals are murdered in a single incident (Blau, Gorry, & Wade, 2016; Krouse & Richardson, 2015).

Within ASE research, thresholds ranging from zero to four homicides per event are commonly used, with zero homicides per event being the most common amongst strict ASE researchers and three to four homicides per event being most common amongst mass murder and mass shooting researchers (see Blair & Martindale, 2013; Blair & Schweit, 2014; Blau, Gorry, & Wade, 2016; Everytown for Gun Safety, 2014; Fox & Delateur, 2013; Nekvasil, Cornell, & Huang, 2015; New York City Police Department, Counterterrorism Bureau, 2012; Police Executive Research, 2014). The use of a zero-homicide criterion is justified by strict ASE researchers because the wounding of

individuals by a mass shooter possesses the same risk to the public and first responders as the murder of individuals. Krouse and Richardson (2015), along with others support, the four-murder victim criterion because it is in line with the data collection methodology used by the FBI in the UCR and the SHR, both of which are commonly used as primary data sources by mass murder researchers. The common use of the UCR and SHR by researchers' supports the use of similar data criterion methodology by researcher utilizing the UCR and the SHR.

MPS characterizes a wide variety of criminal acts including but not limited to rampage shootings, gang shootings, organized crime shootings, workplace shootings, house of worship shootings, and school shootings (Fox & Levin, 2015). If MPS events stemming from gang or drug violence, pervasive, long-tracked, criminal acts, accidental shootings, public suicides, domestic disturbances, and shootings that did not represent a threat to the public are included in ASE studies, the result of the study can be dramatically impacted. Specifically, a larger less restricted sample can cause dramatic increases in the regularity and the casualty rate of ASEs (see Blair & Martindale, 2013; Blair & Schweit, 2014; Crime Prevention Research Center, 2014; Everytown for Gun Safety, 2014; Krouse & Richardson, 2015; Lott, 2014; New York City Police Department, Counterterrorism Bureau, 2012; Police Executive Research, 2014; U.S. Department of Justice, 2013). Due to these facts, the operational definition used to define ASEs must be clearly stated and empirically supported.

The sample size, as defined by the period over which ASEs are evaluated, also impacts study findings. Since the term ASE was coined in 2001, researchers generally

study ASEs occurring after 1999 even though events fitting the definition of an ASE have occurred prior to 1999 (Blair & Martindale, 2013; Blair & Schweit, 2014; New York City Police Department, Counterterrorism Bureau, 2012). For instance, the Luby's shooting in Killeen, Texas, in 1991, the Stockton schoolyard shooting in California in 1989, and the University of Texas shooting in Austin, Texas, in 1966, represent events that occurred prior to 1999 but meet the definition of an ASE (Follman, Aronsen, Pan, & Caldwell, 2012: New York City Police Department, Counterterrorism Bureau, 2012). The inclusion or exclusion of events prior to the advent of the term ASE (+) or (-) affect the overall sample size and in turn the statistical findings of a study (Wheelan, 2013).

The inclusion of ASEs occurring after 1999 does not guarantee the validity of a study. As an example, it is generally accepted that there was a spike in ASEs in 2009 (M = 20. 25) and 2010 (M = 20.25) and an increase in the average casualty rates of ASEs in 2012 (M = 9.9) (see Blair & Martindale, 2013; Blair & Schweit, 2014; Everytown for Gun Safety, 2014; New York City Police Department, Counterterrorism Bureau, 2012). Based on these facts, the inclusion or exclusion of the years 2009, 2010, and 2012 in a study along with the total number of included years, can (+) or (-) impact the regularity and average casualty rate of ASEs annually. Further, the inclusions of 2012 without controlling for outliers is equally problematic because two ASEs, Sandy Hook Elementary School and the Aurora Theater shooting, account for 99 of the 208 casualties reported during ASEs in 2012 (Blair & Schweit, 2014; Everytown for Gun Safety, 2014; Krouse & Richardson, 2015). If these two events are excluded or are controlled for as outliers, the 2012 casualty rate of ASEs falls in line with those of previous years (Blair &

Schweit, 2014; Everytown for Gun Safety, 2014). In addition to the 2009, 2010 and 2012 outlier events, Krouse and Richardson (2015) identified outlier MPSs (events with casualty rates > 10) in 1999 and 2007. Such events also occurred in 2009 and 2012 but were not identified by the Krouse and Richardson (2015) study.

Based on current literature it is imperative that ASE researchers clearly articulate the answer to the following questions.

- Are ASEs being studied as unique events or are mass murder/mass shootings being studied?
- What inclusion and exclusion criterion will be used to define an ASE?
- What sample size will be used and how will it be defined?
- Will outliers be controlled for? If so, why are outliers being controlled for and what methodology will be used to control outliers?

Implications of Past Research on Present Research

The frequency and casualty rate of MPS in the United States have been thoroughly documented by media outlets and the FBI in the UCR, and SHR (Krouse & Richardson, 2015; Huff-Corzine, 2013). The UCR, SHR, and media accounts of MPS are commonly used by researchers to study MPS including workplace, public, and school shootings, which are often categorized as ASEs (Blair & Martindale, 2013; Blair & Schweit, 2014; Huff-Corzine, 2013; New York City Police Department, Counterterrorism Bureau, 2012; Police Executive Research, 2014). When using the ASE framework to study MPSs, a variation of the federal definition of ASEs, that meets the needs of the researcher, are commonly used (see Blair & Martindale, 2013; Blair & Schweit, 2014;

Huff-Corzine, 2013; New York City Police Department, Counterterrorism Bureau, 2012; Police Executive Research, 2014). The major difference in the way that ASEs are defined by researchers generally involves the inclusion or exclusion of a casualty criterion, i.e., number of people wounded and/or murdered during the event. This variation in definition is often cited by researcher as the causes of conflicting results between ASE studies and, therefore, must be addressed in future research (Crime Prevention Research Center, 2014; Lott, 2014).

Social cognitive theory explains how an ASO learns from other offenders and explains the obsession that many offenders had with other ASOs (Helfgott, 2015; Kissner, 2015; Schulman, 2013; Siegert & Siegert, 2013). Similarly, there is consensus among researchers that violent media correlates with increases in micro level aggression and that violent media may be an influencing factor in violent behavior although the relationship may be inverse (Bushman, Gollwitzer, & Cruz, 2015). An inverse relationship between violent media and violent behavior infers that violent individuals seek out violent media which would likewise explain the obsession of ASOs with previous offenders. Moreover, the correlation between suicide rates and media reporting protocols about suicides in Italy was found to be so compelling that the CDC created media reporting guidelines for news media outlets to help reduce suicide rates in the United States (Schulman, 2013). Both the success of media reporting protocols in Italy and the documented obsession of ASOs with previous offenders supports the use of the social cognitive theory framework to study the influence of news media reporting on ASOs (Bandura, 1977, 2001; Schulman, 2013; Schunk, 2012). Further, the relationship

between the number of news media reports about an ASE and the casualty rates of the subsequent ASE has not been previously studied.

Within mass murder and ASE research there is support for the inclusions of variables that impact the availability of firearms to high risk individuals and potential ASOs including but not limited to adolescents and mentally ill individuals (see Blau, Gorry, & Wade, 2016; Hodges & Scalora, 2015; Gius, 2015; Lott, 2010; Kalesan et al., 2013; Metzl & MacLeish, 2015; Webster & Wintemute, 2015; Weinberger et al., 2015). The primary reason for including such variables is that the ability to access a firearm and the ability to use a firearm to cause casualties is a foundational element of firearm crimes including ASEs (Blau, Gorry, & Wade, 2016). In their studies Gius (2015), Kalesan et al. (2013), and Webster and Wintemute (2015), evaluated the impact of federal and state firearm control legislation, beyond prohibited firearms purchases and possession prohibitions, and found that firearm control legislation influences firearm crime rates from region to region. Although, firearm control legislation and firearm prohibition laws have been shown to affect regional firearm crime rates, the degree to which regional firearm control legislation impacts ASEs and ASE casualty rates have not been studied (Fleegler et al., 2015; Gius, 2015; Kalesan et al., 2013; Webster & Wintemute, 2015).

Literature Relating to Differing Methodologies

Mass murder researchers generally do not study ASEs as unique events rather; they categorize ASEs that occur in school, houses of worship, and workplaces as mass shootings or MPS (Fox & Levin, 2015; Krouse & Richardson, 2015). In the study, *Mental Illness, Mass Shootings, and the Politics of American Firearms* Metzl and

MacLeish (2015) state that ASEs do not occur often enough to allow for reliable statistical modeling and, therefore, recommended that ASEs not be studied as unique events. However, due to public outcry and political attention afforded to ASEs, ASE specific research has been undertaken (see Blair & Martindale, 2013; Blair & Schweit, 2014; Crime Prevention Research Center, 2014; Everytown for Gun Safety, 2014; New York City Police Department, Counterterrorism Bureau, 2012). Since the creation of the term ASE in 2001the majority of studies involving ASEs have been historical studies, correlation analyses, and regression analyses aimed at identifying trends related to frequency, casualty rates, and offender demographics (see Blair & Martindale, 2013; Blair & Schweit, 2014; Crime Prevention Research Center, 2014; Everytown for Gun Safety, 2014; New York City Police Department, Counterterrorism Bureau, 2012). When ASEs are analyzed as part of a larger mass shooting category that includes other forms of mass shootings, such as family annihilations by firearms and events prior to 2001 data regarding the frequency of events, casualty rates, and demographic characteristics of ASEs is skewed (see Crime Prevention Research Center, 2014; Everytown for Gun Safety, 2014; Krouse & Richardson, 2015; Lott, 2014). To develop accurate ASE data researchers must study ASEs as unique events.

When ASEs are studied as unique events, the lion's share of researchers have focused on the law enforcement response to ASEs rather than variables that might influence an ASO (see Blair & Martindale, 2013; Blair & Schweit, 2014; New York City Police Department, Counterterrorism Bureau, 2012). When researchers have considered influencing variables, the primary variable studied has been the motivation of the ASO

(Fox, & DeLateur, 2013; Police Executive Research, 2014). The most common motivating factors cited by researchers' is revenge and/or a need to right a perceived injustice (Fox, & DeLateur, 2013; Police Executive Research, 2014).

Many researchers have noted that ASOs are often obsessed with previous offenders and news media reports about them (Kissner, 2015; Page, Daniels, & Craig, 2015; Schulman, 2013; Siegert & Siegert, 2013). Social cognitive theory is an accepted theory that explains how an individual can learn from previous ASEs. Beyond theorizing that an individual can learn from and/or be motivated by the acts of previous ASOs, little research has been conducted to determine why certain offenders are more highly revered by ASOs then others (Helfgott, 2015). One popular theory is that ASOs are obsessed with previous offenders because they want to murder more people than previous offenders in the hopes of gaining attention and becoming infamous (Kissner, 2015). However, a ASOs obsession with a previous ASO may just as likely be related to the amount of news media attention given to some ASOs and not others.

Regression and correlation approaches to the analysis of ASE data typically involves the collection of secondary data including news media reports (see Blair & Martindale, 2013; Blair & Schweit, 2014; Crime Prevention Research Center, 2014; Everytown for Gun Safety, 2014; New York City Police Department, Counterterrorism Bureau, 2012). Regression and correlation analysis seeks to determine the strength, positive or negative, between non-manipulated variables (Wheelen, 2013). When a researcher is attempting to determine which combinations of independent and/or moderating variables affects the direction or extent of a relationship, a multiple

regression analysis is substituted for other regression and correlation approaches. For the purpose of this study, a multiple regression analysis would be optimal if the appropriate statistical assumptions could be met by data because I was unable to manipulate the independent and moderating variables (Wheelen, 2013). Since the data collected in this studied did not meet the appropriate statistical assumptions I conducted a correlation analysis of the ratio variables.

Summary and Conclusions

My review of the literature examined and evaluated ASEs and MPSs research. ASEs, unlike other forms of MPS, evoke strong responses from the news media outlets, the public, and legislators, making them a prominent topic of research and discussion among academicians, practitioners, and the public (Blau, Gorry, & Wade, 2016; Cavanaugh, 2014; Cornell, 2015; Krouse & Richardson, 2015). Further, ASOs wound and murder dozens of people annually, increasing public and academic pressure on ASE researchers to develop ASE interventions (see Blair & Martindale, 2013; Blair & Schweit, 2014; Everytown for Gun Safety, 2014; Krouse & Richardson, 2015; New York City Police Department, Counterterrorism Bureau, 2012). Based on the regularity of ASEs in the United States, the mounting death tolls of these events, and the public concern generated by these events, there is urgency for research that will reduce the frequency of ASEs and ASE casualty rates.

Research examining the regularity of ASEs suggests that ASEs will continue to occur and that the actions of ASOs may influence subsequent ASOs and impact the severity of subsequent events. The strength of regional firearm control legislation has

been shown to affect the number and type of firearm crimes more than national or state level firearm control legislation alone. Based in the information I theorized that the strength of regional firearm control legislation more accurately reflects the impact of firearm control legislation on ASEs than the strength of state of federal firearm control laws alone (Fleegler et al., 2013; Kalesan et al., 2015; Lott, 2010; Webster & Wintemute, 2015).

Researchers continue to examine the impact of violent media on aggression. Still, there continues to be a lack of consensus regarding the impact of news media reports about violent events on the behavior of media consumers. There is, however, a consensus among researchers that violent media causes an increase in micro level aggression and that violent individuals are drawn to violent media (Bonus, Peebles, & Riddle, 2015; Bushman & Anderson, 2014; Bushman, Gollwitzer, & Cruz, C. 2014; Elson & Ferguson, 2013; Ferguson, 2015; Ferguson et al., 2015; Markey et al., 2015). Traditional forms of media, including television, newspapers, and the Internet, are commonly used to seek out information (Kim, 2014). Researchers have not examined the impact of news media reporting rates about ASEs on subsequent ASEs. However, Garcia-Bernardo et al. (2015) found that the number of tweets posted to Twitter about a school based ASE correlated with the likelihood of the subsequent school-based ASEs over a specific period.

The applied methodology of this study was carefully chosen based upon the reviewed literature and supports the conceptual framework of this study as well as the stated statistical analysis methodology. Chapter 3 will describe the methodology used to determine the frequency of ASEs, the number of news media reports between ASEs, the

regional location of the event, as well as demographic characteristics of offender. Retrospective multiple regression pathway analysis and correlation analysis will also be discussed.

Chapter 3: Research Method

Introduction

The purpose of this study was to examine ASE occurring in the United States between April 20, 1999, and June 15, 2016 and to measure the strength of the relationship between the number of news media report about an ASE and the casualty rate of the subsequent ASE. The age and regional location of the subsequent ASO(s) were evaluated as moderating variables. Additionally, the goal of this study was to: (a) develop a list of MPSs that met my operational definition of an ASE, (b) determine the number of news media reports about ASE prior to the ensuing ASE, (c) determine the regional location of each ASE, (d) determine the age of the each ASO, and (e) to measure the degree of variance in casualty rates between ASEs.

The results of this study can be used to create positive social change by improving the ability of LEOs, policymakers, and psychologists, to create interventions that may help reduce the regularity and severity of ASEs. The knowledge gained from this study could also be used by stakeholders to create awareness about the potential impact of news media reporting about violent events on media consumers. Additionally, this study will clearly define what an ASE is as well as the rate of ASEs in the United States between April 20, 1999, and June 15, 2016.

Social learning and the social cognitive theories explains how individuals learn vicariously and symbolically through the observation of models in their environment (Bandura, 1977, 2001; Schunk 2012). Per social cognitive theory, vicarious and symbolic models provided by media influence the beliefs and opinions of media consumers, which

can result in behavioral changes (Cavanaugh, 2014; Fox, & Levin, 2015; Garcia-Bernardo, 2015). Furthermore, researchers have found evidence that exposure violent media increases micro levels of aggression in media consumers (Bushman, Gollwitzer, & Cruz, 2015; Bushman & Anderson, 2014; Helfgott, 2015). News media reports about ASEs are observable models that allow individuals to learn vicariously and symbolically about ASEs.

In the United States, there are documented cases of ASOs who have been obsessed with mass murders and news media reports about them. Subsequently, these obsessed individuals have perpetrated ASEs with higher casualty rates that than other ASEs (Helfgott, 2015; Kissner, 2015; Siegert & Siegert, 2013). Thus, it has been theorized the news media outlets are responsible for influencing the actions of ASOs. This hypothesized causational relationship between the news media coverage of an ASE and the ensuing event has documented in several studies and is generally known as the copycat effect (see Clayborn & Garrison, 2015; Helfgott, 2015; Kissner, 2015; Page, Daniels, & Craig, 2015; Saul & Fredericks, 2013; Siegert & Siegert, 2013).

Regardless of the relationship between news media reporting and subsequent ASEs, ASOs must be able to access and effectively operate a firearm to carry out a shooting. Because a firearm is necessary to carry out a shooting, laws governing firearm access are theorized to impact the severity of ASEs. Likewise, becoming proficient with a firearm requires both the financial means and cognitive ability to do so. Towards that end, the age of an individual is a variable that may influence an ASO ability to obtain and effectively operate a firearm. Additionally, because the strength of firearm control

legislation varies from state to state and the effectiveness of those laws is impacted by the strength of the firearm control legislation in surrounding states it is theorized that the regional location of a ASO may influence their ability to access firearms (Fleegler et al., 2013; Kalesan et al., 2015; Lott, 2010; Webster & Wintemute, 2015).

The purpose of this study was to examine ASEs occurring in the Unites States between April 20, 199 and June 15, 2016 and to determine the degree to which the number of news media reports about the ASE impacts the severity of the subsequent ASE. The age and regional location of the ASO were examined as moderating variables. Figure 2 visually illustrates the theoretical framework and hypotheses of this study.

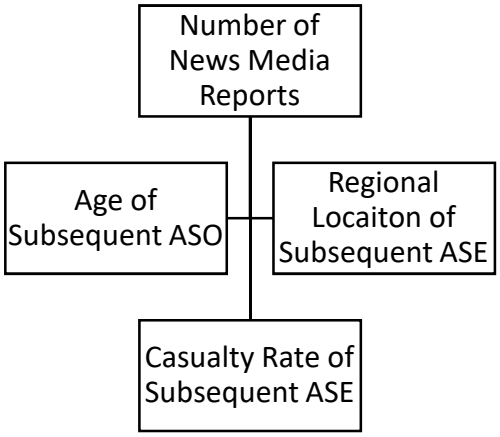

Figure 2. Illustration of the theoretical framework and hypotheses of this study

Research Questions and Hypotheses

RQ1 (Quantitative): Between April 20, 1999, and June 15, 2016, was there a significant relationship between the number of news media reports about an ASE and the casualty rate of the subsequent ASE in the United States?

H_o1: Between April 20, 1999, and June 15, 2016, there was not a significant relationship between the number of news media reports about an ASE and the casualty rate of the subsequent ASE in the United States.

H_t1: Between April 20, 1999, and June 15, 2016, there was a significant relationship between the number of news media reports about an ASE and the casualty rate of the subsequent ASE in the United States.

RQ2 (Quantitative): Between April 20, 1999, and June 15, 2016, was there a significant relationship between the age of the subsequent ASO, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States?

H_o1: Between April 20, 1999, and June 15, 2016, there was not a significant relationship between the age of the subsequent ASO, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.

H_t1: Between April 20, 1999, and June 15, 2016, there was a significant relationship between the age of the subsequent ASO, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.

RQ3 (Quantitative): Between April 20, 1999, and June 15, 2016, was there a significant relationship between the regional location of the subsequent ASE, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States?

H_o1: Between April 20, 1999, and June 15, 2016, there was not a significant relationship between the regional location of the subsequent ASE, the number of news

media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.

H_t1: Between April 20, 1999, and June 15, 2016, there was a significant relationship between the regional location of the subsequent ASE, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.

RQ4 (Quantitative)**:** Between April 20, 1999, and June 15, 2016, was there a significant relationship between the age of the subsequent ASO, regional location of the subsequent ASE, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States?

H_o1: Between April 20, 1999, and June 15, 2016, there was not a significant relationship between the age of the subsequent ASO, the regional location of the subsequent ASE, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.

H_t1: Between April 20, 1999, and June 15, 2016, there was a significant relationship between the age of the subsequent ASO, the regional location of the subsequent ASE, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.

The data set was tested to determine if the necessary retrospective multiple regression analysis employing pathway analysis assumptions could be met. Because the necessary assumptions were not met graphing and correlation analysis was used to determine if the null hypotheses should be retained or rejected in whole or in part. The

rest of this chapter will explore my rationale for a quantitative methodology, specifically, correlation and/or retrospective multiple regression pathway analysis. The strength and weaknesses of the selected methodology will also be explored and vetted.

Research Design and Rationale

Retrospective multiple regression pathway analysis is commonly used by quantitative researchers to investigate the degree of correlation between independent/moderating and dependent variables (Wheelan, 2013). A multiple regression analysis is used when a researcher is attempting to determine which combinations of independent and/or moderating variables best predicts the rate of a dependent variable when the researcher is unable to manipulate the independent and moderating variables (Wheelan, 2013). Pathway analysis is commonly used when researchers want to measure the effect of or the extent to which the moderating/mediating variables influences the relation between the independent and dependent variables. I used secondary historical data to develop the study data set. I identified and evaluated one independent variable, two moderating variables, which could not be manipulated, and one dependent variable resulting in the selection of a multiple regression analysis as the primary methodology and correlation analysis as the secondary or fallback methodology if the data set failed to meet necessary regression assumption (Wheelan, 2013).

The exploration of the independent variable (number of news media reports about ASEs prior to the subsequent event occurring in the United States between April 20, 1999 and June 15, 2016), and the moderating variables (age and location of the subsequent ASOs) requires the analysis of MPSs in the United States to determine which MPSs can

be categorized as an ASE. This analysis is crucial due to the similarity of MPSs and ASEs and the confusion that is created when such an analysis is not undertaken. In other words, all ASEs are MPSs, but not all MPS are ASEs.

In this study, definitions used by the FBI and MPS/ASE researchers were used to categorize events as mass murder, mass shootings, or MPSs. My operational definition of an ASE was based on definitions used by the FBI and MPS/ASE researchers MPS (see Blair & Martindale, 2013; Blair & Schweit, 2014; Everytown for Gun Safety, 2014; Fox & Delateur, 2013; Nekvasil, Cornell, & Huang, 2015; New York City Police Department, Counterterrorism Bureau, 2012; Police Executive Research, 2014). Any event in which four or more people are murdered was categorized as a mass murder. Any event in which a firearm was used to murder four or more people was categorized a mass shooting. Any event in which an individual uses a firearm to actively murder or attempt to murder people in a centralized populated area resulting in the death of four or more victims was categorized as a MPS (see Blair & Martindale, 2013; Blair & Schweit, 2014; Everytown for Gun Safety, 2014; Fox & Delateur, 2013; Nekvasil, Cornell, & Huang, 2015; New York City Police Department, Counterterrorism Bureau, 2012; Police Executive Research, 2014). MPSs stemming from acts related to gang or drug violence, pervasive or long-tracked criminal acts, accidental shootings, public suicides, or did not threaten the public, occurring in a centralized populated area, resulting in the death of four or more individuals by firearm were categorized as a MPS (see Blair & Martindale, 2013; Blair & Schweit, 2014; Everytown for Gun Safety, 2014; Fox & Delateur, 2013; Nekvasil, Cornell, & Huang, 2015; New York City Police Department, Counterterrorism Bureau,

2012; Police Executive Research, 2014). MPSs not stemming from acts related to gang or drug violence, pervasive or long-tracked criminal acts, accidental shootings, public suicides, or did not threaten the public, occurring in a centralized populated area, resulting in the death of four or more individuals by firearm were be categorized as an ASE (see Blair & Martindale, 2013; Blair & Schweit, 2014; Everytown for Gun Safety, 2014; Fox & Delateur, 2013; Nekvasil, Cornell, & Huang, 2015; New York City Police Department, Counterterrorism Bureau, 2012; Police Executive Research, 2014). Figure 3 illustrates the decision process that was used to categorize an event as an ASE.

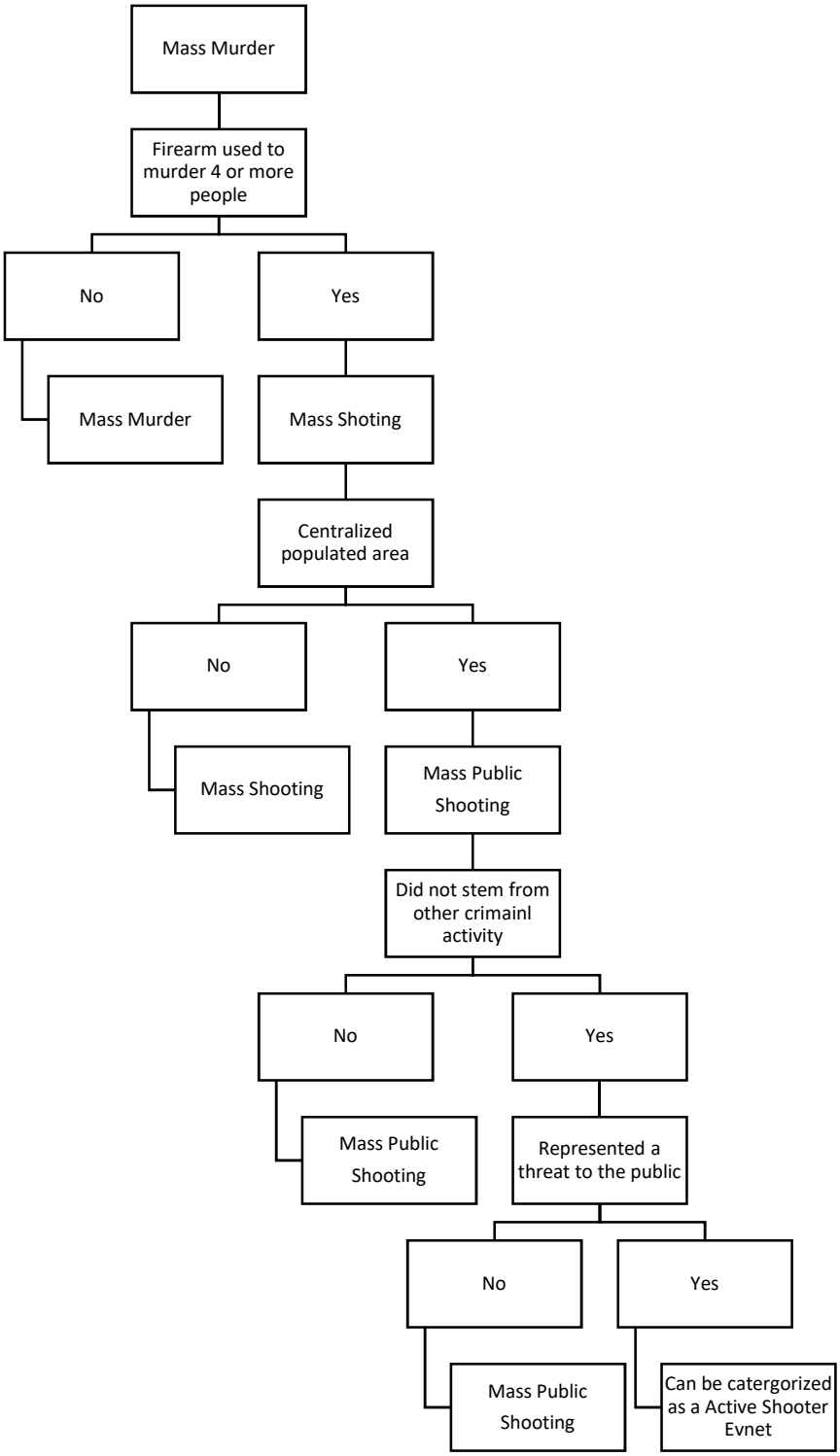

Figure 3. ASE decision tree

Independent Variable

The independent variable in this study was the number of Internet/wire services/newspaper/blog/podcast news media report published about an ASE, occurring in the United States between April 20, 1999, and June 15, 2016, and prior to the subsequent ASE. Internet/wire services/newspaper/blog/podcast news media reports were selected as the benchmark for measuring the number of published news media reports about an event because: (a) the wire services are used by the Associated Press (AP) to disseminate news stories nationally, (b) local news outlets, including newspaper and television news stations use AP stories as a primary source of national news, (c) the Internet allows a researcher to search news stories published by the AP, newspapers, television news stations, and other media sources, and (d) the Internet, newspapers, and television news stations are commonly accessed news source regardless of age group (Kim, 2014). BIs, including the name of the ASE, the name(s) of the ASO(s), and date filters were used to count the number of media news reports published on the Internet or the wire services about an ASE and prior to the subsequent ASE. Specifically, ProQuest Central database wire feed/newspaper/blog/podcasts/website archives and Google News were analyzed using this process. Any article that contained a BI and was published about an ASE and prior to the subsequent ASE was considered a published report. Identical news media reports posted to multiple locations were counted as individual articles because each article represents a unique location where media consumers could have accessed information about ASOs and ASEs.

Moderating Variables

The moderating variables included in this study were the age and the regional location of the subsequent ASO. The age of an individual has been empirically shown to influence the selection of media outlets as well as the individuals' ability to access and use firearms (Kalesan et al., 2015; Kim, 2014; Webster & Wintemute, 2015). The age of the ASO was measured in years and collected from demographic information contained in secondary data sources including, but not limited to existing MPS/ASE studies and the Internet.

Like age, the regional location of an ASE is directly related to firearm accessibility and, therefore, an individual's ability to carry out an ASE (see Webster & Wintemute, 2015). The regional location of an ASE was assigned based the on the regional boundaries outlined in the U.S. Census Bureau Regions and Divisions with states Federal Information and Processing Standards (FPIS) codes map (U.S. Census Bureau, 2015). Northeast, Midwest, South, and West are the regional locations assigned to states and districts by the U.S. Census Bureau (see Table 4). Age and regional location, as it relates to the strength of the region's firearm control legislations, are moderating variables because both variables are continuous. Further, I theorized that these variables had a positive effect on the relationship between the independent and dependent variable rather than explaining the relationship.

Table 4

U.S. Census Bureau Regions

Region	State/District
Northeast	Connecticut
	Maine
	Massachusetts
	New Hampshire
	New Jersey
	New York
	Pennsylvania
	Rhodes Island
	Vermont
Midwest	Kansas
	Indiana
	Illinois
	Iowa
	Michigan
	Minnesota
	Missouri
	Nebraska
	North Dakota
	Ohio
	South Dakota
	Wisconsin
South	Alabama
	Arkansas
	Delaware
	District of Columbia
	Florida
	Georgia
	Kentucky
	Louisiana
	Maryland
	Mississippi
	North Carolina
	Oklahoma
	South Caroline
	Tennessee
	Texas
	Virginia

Table continues next page

Region	State/District
South	West Virginia
West	Alaska
	Arizona
	California
	Colorado
	Hawaii
	Idaho
	Montana
	Nevada
	New Mexico
	Oregon
	Utah
	Washington
	Wyoming

Note: Adapted from *Census Regions and Divisions of the United States*, by U.S. Census Bureau, 2015. Retrieved from http://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf

Dependent Variable

The dependent variable in this study was the number of individuals murdered or wounded during a ASE, occurring in the United States between April 20, 1999 and June 15, 2016. Secondary data sources including existing MPS/ASE studies and the Internet were used to calculate the casualty rate of each ASE. An MPS had to have a mortality rate of ≥ 4 and casualty rate of ≥ 0 to be categorized as an ASE. For this study, the casualty rate of an ASE did not include casualties sustained by the ASO regardless of the nature of the casualty, i.e., self-inflicted or sustained via other means.

I used directional hypotheses in this study to measure the positive effect of the independent and moderating variables on the dependent variable. Upon completion of this study, the null hypotheses were retained (Hanna & Dempster, 2012). Assumption testing to determine the appropriate analysis stagey was undertaken. Correlation analysis

was used to measure the relationship between the independent variable and the dependent variable in Hypotheses 1 and the relation between the independent and moderating variable, age of ASO, in Hypotheses 2, 3, and 4. The moderating variable, reginal location was not included in the correlation analysis because it was nominal variable (Field, 2013).

The population in question was properly represented in this study because all ASEs, occurring in the United States between April 20, 1999 and June 15, 2016 where included. A scatter plot graph analysis was used to determine if events such as the Columbine High School, VPI and State University, Fort Hood, and Sandy Hook Elementary shootings, which had a casualty rate at least twice that of the median average for the year, in which they occurred, represented substantial outliers, as theorized (Krouse & Richardson, 2015). Because outliers existed Spearman's correlation analysis was used to measure the correlation between the independent variable, moderating variable (age of ASO) and dependent variable (Wheelan, 2013). The design of this study was consistent with research designs currently used by mass murder, MPS, and ASE researchers (see Blair & Martindale, 2013; Blair & Schweit, 2014; Everytown for Gun Safety, 2014; Fox & Delateur, 2013; 2012; Nekvasil, Cornell, & Huang, 2015; New York City Police Department, Counterterrorism Bureau, 2012; Police Executive Research, 2014). Further, correlation analysis was the safest manner to measure the effect of the independent and moderating variable, age of the ASO, on the dependent variable (Wheelan, 2013).

Methodology

My goal for conducting this study was to analyze ASEs occurring in the United States between April 20, 1999, and June 15, 2016 and to measure the impact of the independent and moderating variables on the dependent variable. For this study, an ASE was defined as any event in which an individual uses a firearm to actively murder or attempt to murder people in a centralized populated area resulting in the murder of four or more victims by firearms. Events that stemmed from gang or drug violence, pervasive, long-tracked, criminal acts, accidental shootings, public suicides, or did not represent a threat to the public were not categorized as ASEs

Population

Based on my review of the literature and my operational definition of an ASE, the number of ASEs occurring in the United States between April 20, 1999, and June 15, 2016, was finite ($N = 55$). Because the number of ASEs is finite, all known ASEs were included in this study. The inclusion of all known ASEs ensures that the results of the study applied to the specified population and that the distribution of the regression coefficient is the true coefficient.

Sampling and Sampling Procedures

Similarly, to the Blair and Martindale (2013), Blair and Schweit (2014), Kelly (2012), Kissner (2015), and Krouse and Richardson (2015) studies, I defined the term ASE in a manner that closely aligns with the FBI definition of a MPS/ASE. For this study, an ASE was defined as any event in which a suspect uses a firearm to actively murder or attempt to murder people in a centralized populated area resulting in the

murder of four or more victims by firearms. Events that stemmed from gang or drug violence, pervasive, long-tracked, criminal acts, accidental shootings, public suicides, or did not represent a threat to the public were not included. ASO were defined as the individual(s) that were responsible for carrying out an ASE. By employing this definition of ASEs, the parameters of the study align with current mass murder data collection methodology and share a common verbiage that will allow this study to be used in unison with other ASE studies (see Blair & Martindale, 2013; Blair & Schweit, 2014; New York City Police Department, Counterterrorism Bureau, 2012; Police Executive Research, 2014).

Secondary data sources including existing MPS/ASE studies and Internet/wire services, specifically ProQuest Central database wire feed/newspaper/blog/podcasts/website archives and Google News were used to develop a list of events that met my operational definition of an ASE. An intercoder process was used in the construction of this list to protect the validity of the study. Additionally, events meeting my operational definition of an ASE that occurred prior to April 20, 1999 of after June 15, 2016, and/or did not result in the murder of at least four individuals by firearms were excluded from this study.

Fifty-five ASEs occurred in the United States between April 20, 1999 and June 15, 2016, making the inclusion of all known ASEs possible, negating the need for a sampling strategy (see Blair & Martindale, 2013, Blair & Schweit, 2014, New York City Police Department, Counterterrorism Bureau, 2012; Kissner, 2015; Krouse & Richardson, 2015). Further, because an ASE is a criminal event and ASEs garner

substantial news media and law enforcement attention, the likelihood of an ASE occurring and going unreported in the Unites States between April 20, 1999, and June 15, 2016, is unlikely. This fact made the inclusion of all ASEs occurring in the United States between April 20, 1999, and June 15, 2016, an obtainable goal.

Data Collection

This study used secondary data from existing literature and electronic data sources. Specifically, existing MPS/ASE studies, ProQuest database, and the Internet were the primary secondary data sources used in this study. This data collection methodology is commonly used in mass murder regression analysis and historical studies (see Blair & Martindale, 2013; Blair & Schweit, 2014; Krouse & Richardson, 2015; New York City Police Department, Counterterrorism Bureau, 2012). Further, the stated sources of secondary data are readily available to the public and researchers alike.

Active Shooter Events

Data from Internet posts, the Blair and Schweit (2014), Crime Prevention Research Center (2014), Everytown for Gun Safety (2012), Follman, Aronsen, Pan and Caldwell (2012), and New York City Police Department, Counterterrorism Bureau (2012) studies was used to create an initial list of MPSs occurring in the United States between April 20, 1999 and June 15, 2016. After I developed an initial list of MPSs a search of the Internet and ProQuest Central database wire feed and newspaper archives was carried out to determine if there were additional MPSs that were not identified in the initial search. I also used these secondary searches to gather demographic data regarding offenders, the location of the MPS, and the casualty rate of each MPS. Intercoders were

used to analysis the list of MPS to determine which events met the operational definition of a ASE. Those events that met my operational definition of an ASE were included in the final data set.

Intercoder Process

After a list of MPSs was developed, an intercoder process was used to vet each MPS to determine if the MPS met my operational definition of an ASE. Each intercoder independently evaluated each MPS to determine if the event met my operational definition of an ASE, after which the intercoders conferred. MPSs that were unanimously categorized as ASEs by the intercoders were included in the final data set. When the intercoders could not reach a unanimous decision, a consensus was sought. When a consensus was not reached, the event was excluded, and its exclusion was documented.

Intercoders

Three intercoders were used to evaluate the MPS list, Cara R. Tilbury, Curtis Rasmussen, and I. Tilbury and Rasmussen, two volunteers, were not associated with this study in any other capacity. Intercoders were selected using the following criterion:

- Intercoders were volunteers.
- Intercoders had a fundamental understanding of the ASE research.
- Intercoders had a fundamental understanding of the applied conceptual framework.
- Intercoders were familiar with my operational definition of an ASE.
- Intercoders lacked conflicts of interest that could create the appearance of impropriety.

Intercoder One, Cara R. Tilbury, is a Forensic Psychology doctoral candidate at Walden University (C. Tilbury, personal communication, September 28, 2015). Ms. Tilbury has earned four undergraduate degrees, Associates in Applied Science in Criminal Justice, Bachelor of Science in Criminal Justice, Bachelor of Science in Psychology, and a Master of Science in Forensic Psychology. Additionally, Tilbury holds professional licenses as a LPCMH (Licensed Professional Counselor of Mental Health), CADC (Certified Alcohol and Drug Abuse Counselor), and a CCDP-D (Certified Co-Occurring Disorders Professional Diplomate) (C. Tilbury, personal communication, September 28, 2015). Currently, Ms. Tilbury is a Substance Abuse and Behavioral Modification Program Director within the Delaware Department of Corrections (C. Tilbury, personal communication, September 28, 2015). Ms. Tilbury is also a member of the American Psychology Law Society, Psi-Chi National High Honor Society in Psychology, and the International Association of Correctional and Forensic Psychology (C. Tilbury, personal communication, September 28, 2015).

Ms. Tilbury had a fundamental understanding of social learning and social cognitive theory, and mass murder research. Additionally, Tilbury was familiar with my operational definition of ASEs. Ms. Tilbury was not associated with this study in any other manner and had no stake or biases toward the outcome of this study. Ms. Tilbury was serving as an intercoder voluntarily. Ms. Tilbury was aware of the duties/responsibilities of an intercoder and agreed to the terms of serving as an intercoder.

Intercoder Two, Curtis Rasmussen, is a doctoral candidate in the Industrial-Organizational Psychology program at Walden University (C. Rasmussen, personal

communication, October 9, 2015). Mr. Rasmussen has earned a Bachelor of Arts in Homeland Security and a Master of Arts in Intelligence Studies (C. Rasmussen, personal communication, October 9, 2015). Currently, Mr. Rasmussen is the lead researcher and analyst for the Federal Emergency Management Agency, National Integration Center (C. Rasmussen, personal communication, October 9, 2015).

Mr. Rasmussen had a fundamental understanding of social learning, social cognitive theory, and mass murder research. Additionally, Mr. Rasmussen was familiar with my operational definition of ASEs. Mr. Rasmussen was not associated with this study in any other manner and had no stake in the outcome of the study. Mr. Rasmussen volunteered to fulfill the role of an intercoder and was aware of the duties/responsibilities of an intercoder.

Age, Location, and Casualty Rate

Data from Internet posts, the Blair and Schweit (2014), Crime Prevention Research Center (2014), Everytown for Gun Safety (2012), Follman, Aronsen, Pan and Caldwell (2012), and New York City Police Department, Counterterrorism Bureau (2012) were used to gather ASO demographic data and the location and casualty rate of each ASE. Additional data including the type of the location, the gender of the ASO, and the race of the ASO was also gathered.

Number of Media Reports

To count the number of news media reports published after an ASE an prior to the subsequent ASE the ProQuest Central database wire feed/newspaper/blog/podcasts/website archives and Google News were analyzed using

BIs and data filters. The date of each ASE and the date prior to the subsequent ASE were used as the parameters of each search. BIs including the name(s) of the ASO, and the name of the ASE were used to search ProQuest Central database wire feed/newspaper/blog/podcasts/website archives and Google News. Each report was counted as a single news media report. Identical reports posted or published by different outlets were counted as individual reports because each report represented a unique location where the report could be accessed. The total number of news media reports found on ProQuest Central database wire feed/newspaper/blog/podcasts/website archives and Google News were added together to create a grand total. The rate of news media reporting was determined by dividing the grand total of news media reporting about the event by the number of days between the event and the ensuing event. This process was followed for each ASE included in this study.

Threats to Validity

For more than three decades' mass murder and ASE researchers have used regression and correlation analysis to analyze secondary data relating to mass murder and ASEs (see Blair & Martindale, 2013; Blair & Schweit, 2014; Krouse & Richardson, 2015; New York City Police Department, Counterterrorism Bureau, 2012). Further, a multiple regression analysis is commonly used by researchers when the researcher is unable to manipulate independent/moderating variables, and the researcher is attempting to determine which combinations of variables best explains the relation between the independent and dependent variable (Wheelan, 2013). Further, pathway analysis is commonly used by researchers to analyze the effect of moderating variables on the

relationship between the independent and dependent variable. When a data set does not meet the required statistical assumptions necessary to conduct a regression analysis correlation analysis is commonly used to evaluate the interaction of included variables

When conducting correlation research, there are two types of threats that can affect the internal and external validity of this study: (a) the threats created by the study design, and (b) the threats created by the study methodology. The probable threats to the internal validity of this study are history, maturation, statistical regression, selection, testing, instrumentation, design contamination, experimental mortality, compensatory rivalry, and resentful demoralization (Michael, 2012). The threat posed by history was not a threat to the internal validity of this study, because this was a retrospective study using historical data and therefore could not be influenced by the occurrence of new events. Maturation, in the form of age, was a moderating variable in this study and therefore the threat posed by maturation was limited and accounted for. The threat posed by selection was controlled in this study by specifically defining the dependent variable based on current federal data collection practices. Testing was not a threat to the internal validity of this study because pre-testing was not a part of this study. The threat posed by instrumentation was not a threat to the internal validity of this study because the dependent variable was measured simultaneously using historical data. Statistical regression, experimental morality, design contamination, experimental mortality, compensatory rivalry, and resentful demoralization were not a threat to the internal validity of this study because this study did not include test subjects.

External threats to the validity of the study based on the design of the study included population validity and ecological validity (Michael, 2012). The validity of the population included in this study was controlled for by including all events that met my operational definition of an ASE. Since this study included all events that met my operational definition of an ASE, which was based on federal data collection criterion, the results of this study were insulated against ecological threats.

The key threat to the internal, external, and construct/statistical validity of this study based on the study methodology were the parameter of the independent and dependent variables, and the resulting impact that those parameters had on the statistical analysis. The classification of a MPS as an ASE required a mortality rate of ≥ 4 and a casualty rate of ≥ 0 that was not inclusive of casualties sustained by the ASO, to ensure that this study aligned with current federal data collection protocols and with common terminology used in mass murder, MPS, and ASE research. The parameters by which MPSs were categorized as an ASE could potentially influence the independent variable as well, due to the fact the time frame during which the independent variable (number of news media reports) was determined by included events.

The results of Blair and Schweit (2014) study revealed that ASEs occurring in the United States between 2000 and 2013 had a median mortality rate of 3.04. The Blair and Schweit's (2014) study placed the median mortality rate at .96 points below mortality threshold ≥ 4 of this study. By employing the mortality criterion above that of the reported median mortality rate of ASEs over an identical period (+/- 1-year) the statistical validity of the study could be jeopardized. However, the results of the Krouse and

Richardson (2015) study determined that the median mortality rate for MPS occurring in the United States between 1999 and 2013 was 6.77. The Krouse and Richardson study placed the median mortality rate per event 2.77 points higher than the ≥4 mortality threshold of this study creating the same concerns regarding validity as the reported median mortality rate of the Blair and Schweit (2014) study. Further, Metzl, and Macleish (2015) argue that ASEs do not occur with enough regularity for valid statistical modeling, making any discussion about mortality rates inconsequential. To avoid these and other threats to the internal and external validity of this study the following processes was integrated into the methodology of this study:

- My operational definition of an ASE aligned with federal data collection processes and accepted mass murder research vernacular.
- All MPS occurring in the United States between April 20, 1999, and June 15, 2016, meeting my operational definition of an ASE were included in this study.
- Outliers, if present, were included in whole and explained, rather than applying data cleaning techniques often used in quantitative research.
- The existing MPS/ASE studies and Internet/wire service reports were used as secondary data sources to ensure the inclusion of all possible events.

By employing these steps and processes, the results of the study are applicable to all ASEs meeting the operational definition of an ASE occurring in the United States between April 20, 1999 and June 15, 2016. In turn, the results of this study cannot be generalized to all MPSs nor were the results designed to be.

Ethical Procedures

The secondary data relating to criminal activity used in this study was available to the public. Identifying information about ASOs was only included in this study if said information was officially released to the public by a law enforcement agency previously and its inclusion in the study was prudent. The use of this type of secondary data negated the need for the creation of informed consent, ensuring voluntary participation, a withdrawal process, and anonymity of confidentiality protocols. However, the intercoder process used to categorize a MPS as an ASE is vulnerable to ethical malfeasance. Due to the threat that the intercoder process possessed to the ethical parameters of this study the following criterion were used to select intercoders:

- Intercoders were volunteers.
- Intercoders had a fundamental understanding of the ASE research.
- Intercoders had a fundamental understanding of the applied conceptual framework.
- Intercoders were familiar with my operational definition of an ASE.
- Intercoders lacked conflicts of interest that could create the appearance of impropriety.
- Only those events in which a unanimous decision regarding the categorization of MPS as an ASE were included in this study.
- A list of excluded events and a summary of the reasoning for excluding the events was maintained.

Summary

The methodology of this study was designed to conduct a retrospective multiple regression pathway or a correlation analysis. Further, the methods developed for this study were created to explore the stated research questions and to determine if the null hypotheses should be retained or rejected. To ensure the validity of this study the methodology and the application of the methodology of this study was based on insight drawn from the literature review contained in Chapter 2. Chapters 1, 2, and 3, known as the proposal, were presented and approved by the Walden University Internal Review Board (IRB) and served as the foundation for the data collection and statistical analysis methodology of this study.

Chapter 4: Results

Introduction

The purpose of this quantitative study was to determine if the number of news media reports about an ASE impacted the casualty rates of the subsequent ASE occurring in the United States between April 20, 1999, and June 15, 2016. Additionally, the age and regional location of the subsequent ASO was examined as moderating variables. To examine this issue, I had to: (a) develop a list of ASEs occurring in the United States between April 20, 1999, and June 15, 2016, (b) determine the number of news media reports published about an ASE prior to the ensuing ASE, (c) determine the regional location of each ASE, (d) determine the age of the each ASO(s), and (e) measure the degree of variance in casualty rates between ASEs.

Research Questions and Hypotheses

The following research questions and hypotheses were developed to evaluate the relation between the independent, dependent, and moderating variables:

RQ1 (Quantitative): Between April 20, 1999, and June 15, 2016, was there a significant relationship between the number of news media reports about an ASE and the casualty rate of the subsequent ASE in the United States?

H_o1: Between April 20, 1999, and June 15, 2016, there was not a significant relationship between the number of news media reports about an ASE and the casualty rate of the subsequent ASE in the United States.

$H_1$1: Between April 20, 1999, and June 15, 2016, there was a significant relationship between the number of news media reports about an ASE and the casualty rate of the subsequent ASE in the United States.

RQ2 (Quantitative): Between April 20, 1999, and June 15, 2016, was there a significant relationship between the age of the subsequent ASO, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States?

H_o1: Between April 20, 1999, and June 15, 2016, there was not a significant relationship between the age of the subsequent ASO, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.

$H_1$1: Between April 20, 1999, and June 15, 2016, there was a significant relationship between the age of the subsequent ASO, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.

RQ3 (Quantitative): Between April 20, 1999, and June 15, 2016, was there a significant relationship between the regional location of the subsequent ASE, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States?

H_o1: Between April 20, 1999, and June 15, 2016, there was not a significant relationship between the regional location of the subsequent ASE, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.

$H_1$1: Between April 20, 1999, and June 15, 2016, there was a significant relationship between the regional location of the subsequent ASE, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.

RQ4 (Quantitative)**:** Between April 20, 1999, and June 15, 2016, was there a significant relationship between the age of the subsequent ASO, regional location of the subsequent ASE, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States?

H_o1: Between April 20, 1999, and June 15, 2016, there was not a significant relationship between the age of the subsequent ASO, the regional location of the subsequent ASE, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.

$H_1$1: Between April 20, 1999, and June 15, 2016, there was a significant relationship between the age of the subsequent ASO, the regional location of the subsequent ASE, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.

The remainder of Chapter 4 discusses my data collection and analysis procedures and presents my results. The chapter concludes with a summary of the research questions and the results. I also provide a transition to Chapter 5.

Data Collection

All MPS occurring in the United States between April 20, 1999, and June 15, 2016, meeting my operational definition of an ASE were included in this study.

Secondary data from existing literature and other sources were used in the development of this list. The primary secondary data sources used in this study were publicly available MPS and ASE studies, news media reports, and Internet posts published to Google News. This data collection methodology is commonly used in mass murder and ASE historical studies making it ideal for this study (see Blair & Martindale, 2013; Blair & Schweit, 2014; Krouse & Richardson, 2015; New York City Police Department, Counterterrorism Bureau, 2012).

Active Shooter Events

Data from Internet posts, ProQuest Central database wire feed/newspaper/blog/podcasts/ website archives, the Blair and Schweit (2014), Crime Prevention Research Center (2014), Everytown for Gun Safety (2012), Follman, Aronsen, Pan and Caldwell (2012), and New York City Police Department, Counterterrorism Bureau (2012) studies were used to create a list of MPSs that occurred in the United States between April 20, 1999, and June 15, 2016 and resulted in four fatalities. I then completed another search of Google and the ProQuest Central database using BIs to determine if there were additional MPSs that were not identified by my initial search. During the secondary search, I collected demographic data regarding offenders, the location and the casualty rate of each MPS. Seventy-seven MPS with a mortality rate of ≥ 4 were identified.

An intercoder process was used to evaluate the MPS list to determine whether each MPS met my operational definition of an ASE. Each intercoder independently evaluated each of the 77 MPSs to determine if the events met my operational definition

of an ASE, after which the intercoders conferred. MPSs that were unanimously categorized as ASEs by the intercoders were included in the final data set. In cases where a unanimous agreement was not reached by the intercoders, a consensus was sought. When a consensus was not reached, the event was excluded, and its exclusion was documented. Fifty-five MPS ($N = 55$) were categorized as ASEs.

Internet and Wire Service News Reports

BIs were used to search Google and the ProQuest Central database for news reports about each ASE. The 'news' filter tab was used to restrict the searches conducted using Google, to news stories relating to an ASE. To restrict the searches conducted using the ProQuest Central database the blogs/podcasts/websites, newspapers, and wire service filters were used. Date filters and BIs were also used to narrow the search parameters to ensure the relevance of individual search results. Result summaries and abstracts were reviewed to ensure the relevance of each result. To be considered relevant, the report had to include the BIs and specifically address the event in question

Approximately, six variations or combinations of BIs were evaluated to determine which combination of BIs would result in the highest number of relevant results. Initially, BIs including the terms: *mass shooting, active shooter, mass public shooting, active shooter event, school shooting*, the names of the ASO, the name of the ASE, and the location of the ASE were used. However, due to the large amount of unrelated results that were returned using this list of BIs, the list of BIs was modified through additional test searches using variations of these BIs. After conducting an evaluation of the search results, it was determined that the most effective BIs for locating news media articles and

posts was the name/location of the ASE, i.e. Aurora Theater Shooting and the last name of the ASO, i.e. Lanza, Harris. On occasion, due to the commonality of an ASO's name, the BIs were modified slightly by adding the term shooting, the ASO's full name, or by removing the location/ASE name (see Appendix A).

Initially, it was my attention to use Google News, Yahoo News, and Bing News search engines to locate news media reports about ASEs. However, Yahoo and Bing search engines do not allow a user to search by a custom date range. Due to this limitation, I did not use the Yahoo News and Bing News search engines to collect data. To address this change in methodology and ensure that as many specific news media reports were included in this study, the blog/podcast/website filter was added to the ProQuest Central database data filters (see Appendix A). The results of each search were reviewed to ensure that each report was relevant and offered information about that ASE. I believe that the results of the searches were a representative sample of the total number of news media reports available about each event. Any error in results of an individual search should be consistent across all searches due to the consistency of the search methodology.

Custom date range filters were used to search Google News and the ProQuest Central database. Date ranges began with the date of the ASE and ended the day prior to the ensuing ASE, i.e. Columbine High School ASE; April 20, 1999, through July 28, 1999; Atlanta Day Trading Shooting. These same date ranges were also used to calculate the number of days between ASEs. As an example, 100 days elapsed between the Columbine High School ASE on April 20, 1999, and the Atlanta Day Trading ASE on

July 28, 1999 (see Appendix A). The "Calculate Duration Between Two Dates" web tool found at http://www.timeanddate.com/date/duration.html was used to calculate the number of days between ASEs. The "Include end date calculation" function was used to ensure that the end date was accounted for.

Number of Media Reports and Media Reporting Rates

The total number of news media reports about an ASE was calculated by adding the results of the ProQuest Central database search to the results of the Google News search. After totaling the number of news media report for each ASE the rate of media reporting was calculated by dividing the total number of media reports by the number of days between events. The Excel formula function was used to calculate both the total number of media reports and the rate of media reporting. The formula =SUM(S#:U#), when the S cell equals the number of ProQuest Central database results, and the U cell equals numbers of Google News results, was used to calculate the total number of media reports. The formula =V#/W#, when V cell equals "Total number of reports" and W cell equals "Number of days between ASEs," was used to calculate the rate of the media reporting. Because it is hypothesized that the rate of media reporting about a ASE impacts the severity of the subsequent ASE, the rate of media reporting of a previous ASE was associated with the subsequent ASE; i.e., the media reporting rate of the Columbine High School ASE was associated with the Atlanta Day Trading ASE (see Table 5).

Table 5

Number of News Media Reports and Rate of News Media Reporting

ASE	ProQuest Central	Google News	Total number of reports between events	Number of days between ASEs	News media reporting rate per day
Columbine High School*	30073.0	0	N/A	100	N/A
Atlanta Day Trading	-	-	30073	-	300.73

* Initial event

Casualty Rate

Data from Internet posts, ProQuest Central database wire feed/newspaper/blog/podcasts/website archives, the Blair and Schweit (2014), Crime Prevention Research Center (2014), Everytown for Gun Safety (2012), Follman et al. (2012), and New York City Police Department, Counterterrorism Bureau (2012) studies, were used to determine:

- The number of individuals killed during each ASE, not including the ASO (mortality rate).
- The number of individuals wounded during each ASE, not including the ASO (injury rate).

The Excel formula function was used to calculate the total casualty rate of each ASE. The formula =SUM(J#:K#), when the J cell equals the mortality rate of the event, and the K cell equals the injury rate of the event, was used to calculate the total casualty rate of the event (See Table 6)

Table 6

Casualty Rate

ASE	Mortality rate	Injury rate	Casualty rate
Columbine High School	13	24	37
Atlanta Day Trading	14	13	27

Age, Gender, and Race

Data from Internet posts, ProQuest Central database wire feed/newspaper/blog/podcasts/ website archives, the Blair and Schweit (2014), Crime Prevention Research Center (2014), Everytown for Gun Safety (2012), Follman et al. (2012), and New York City Police Department, Counterterrorism Bureau (2012) studies, were used to gather demographic data regarding offenders including:

- The age of the offender or average age when there were multiple offenders.
- The gender of the offender, i.e. male or female.
- The racial identity of the offender, i.e. African American, Asian, Caucasian, Hispanic, Native American, Other.

Region, State/City, Location and Location Type

Data from Internet posts, ProQuest Central database wire feed/newspaper/blog/pod casts/website archives, the Blair and Schweit (2014), Crime Prevention Research Center (2014), Everytown for Gun Safety (2012), Follman et al. (2012), New York City Police Department, Counterterrorism Bureau (2012) studies, and the U.S. Census Regions and Divisions with states, FIPS codes map were used to determine the location of the ASE including:

- The region in which the event took place.
- The state/city in which the event took place.
- The name of the location where the event occurred.
- The type of location i.e. business, business (Gov), public location, place of worship, residence, or school.

Population

This study included all MPS occurring in the United States between April 20, 1999, and June 15, 2016, that were categorized as an ASE based on my operational definition of such (*N = 55)*. Due to the inclusion of all known MPS, meeting my operational definition of an ASE, the population included in the study was representative of the population.

Results

The purpose of this study was to determine the relationship, if any, between the number of news media reports about an ASE, the age and regional location of the ASO, and the casualty rate of the subsequent ASE. An ASE is any event in which an individual used a firearm to actively murder or attempt to murder people in a centralized populated area resulting in the murder of four or more victims (Blair & Martindale, 2013; Blair & Schweit, 2014; Everytown for Gun Safety, 2014; Fox & Delateur, 2013; Nekvasil, Cornell, & Huang, 2015; New York City Police Department, Counterterrorism Bureau, 2012; Police Executive Research Forum, 2014). If the incident stemmed from gang or drug violence, pervasive, long-tracked, criminal acts, accidental shootings, public suicides, or did not represent a threat to the public, it was not categorized as an ASE (see

Blair & Martindale, 2013; Blair & Schweit, 2014; Everytown for Gun Safety, 2014; Fox & Delateur, 2013; Nekvasil et al., 2015; New York City Police Department, Counterterrorism Bureau, 2012; Police Executive Research Forum, 2014).

The total number of media reports between ASEs was calculated by adding the results of the ProQuest Central database search to the results of the Google News search. The rate of media reporting was calculated by dividing the total number of media reports by the number of days between events. The Excel formula function was used to calculate both the total number of media reports and the rate of media reporting. Because it is hypothesized that the rate of media reporting about a ASE impacts the severity of the ensuing ASE, the media reporting rate of the previous ASE was associated with the subsequent ASE.

Data from Internet posts, ProQuest Central database wire feed/newspaper/blog/pod casts/website archives, the Blair and Schweit (2014), Crime Prevention Research Center (2014), Everytown for Gun Safety (2012), Follman et al. (2012), and New York City Police Department, Counterterrorism Bureau (2012) studies, were used to gather demographic data regarding offenders, including the age of the ASO. The age of the ASO was measured in years.

Data from Internet posts, ProQuest Central database wire feed/newspaper/blog/pod casts/website archives, the Blair and Schweit (2014), Crime Prevention Research Center (2014), Everytown for Gun Safety (2012), Follman et al. (2012), and New York City Police Department, Counterterrorism Bureau (2012) studies, were used to determine the location and casualty rate of each ASE. The casualty rate of

each ASE was determined by adding the injury rate and the mortality rate of each ASE. The U.S. Census Bureau Regions and Divisions with states, FIPS codes map, was used to assign a regional location to each ASE (U.S. Census Bureau, 2015).

Descriptive Statistic Results

Figures 4 – 9 illustrates the descriptive statistics associated with the study dataset.

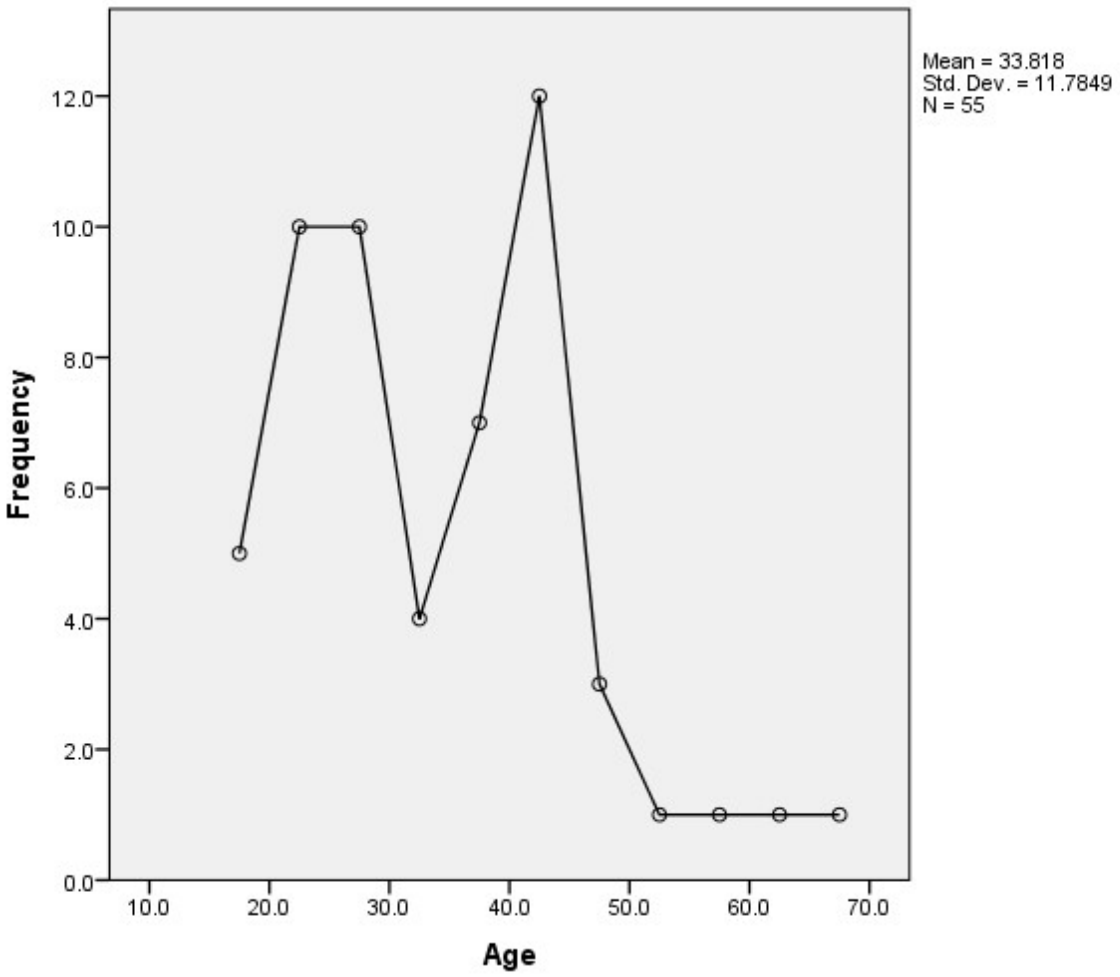

Figure 4. ASO age

This graph details the number of times an ASO of a specific age committed an ASE. The mean age of ASOs was 33.8 years old with a *SD* of 11.78 years.

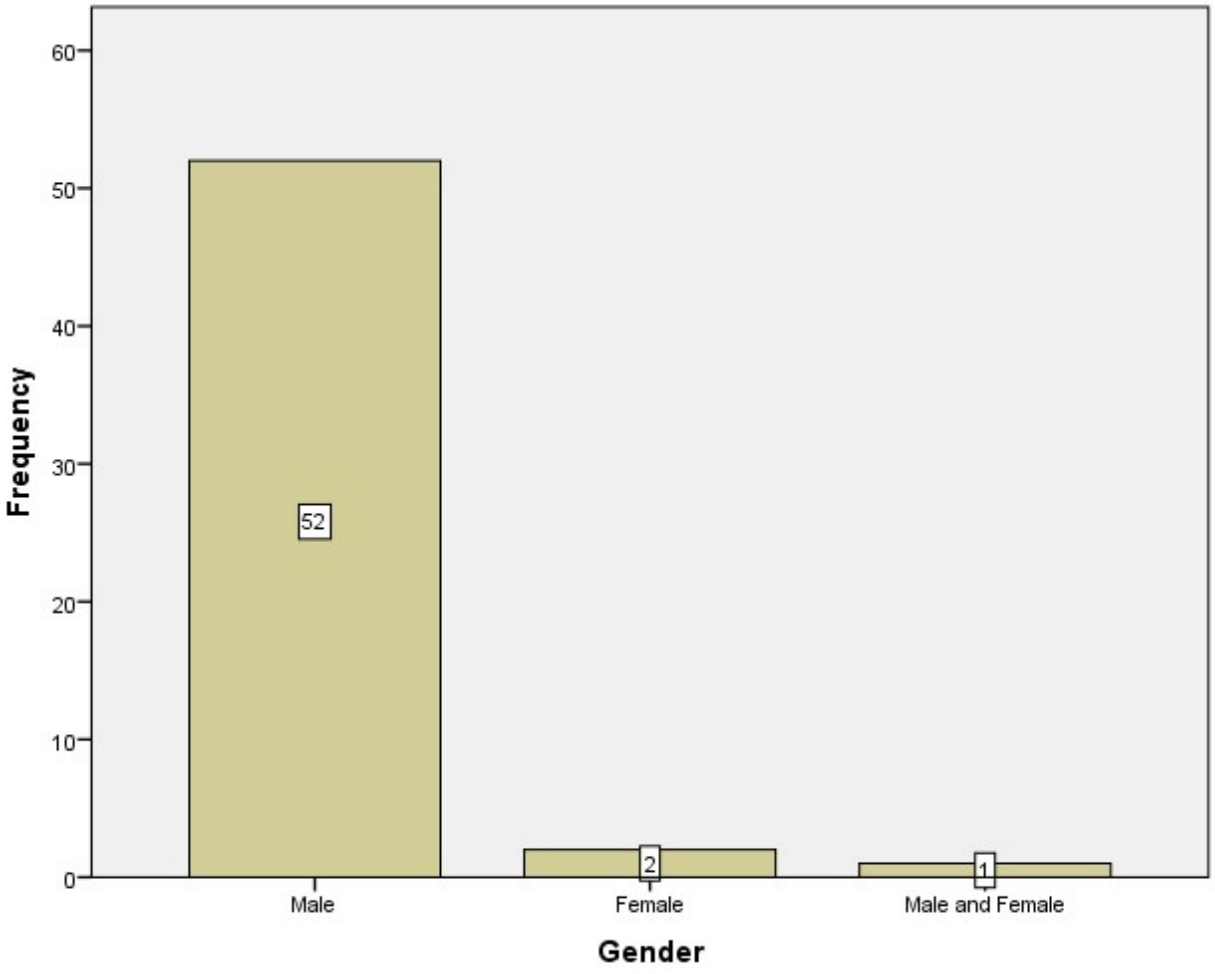

Figure 5. ASO gender

Of the 55ASEs included in this study, 52 were carried out by male ASOs, two were carried out by female ASOs, and one was committed by a male and female team.

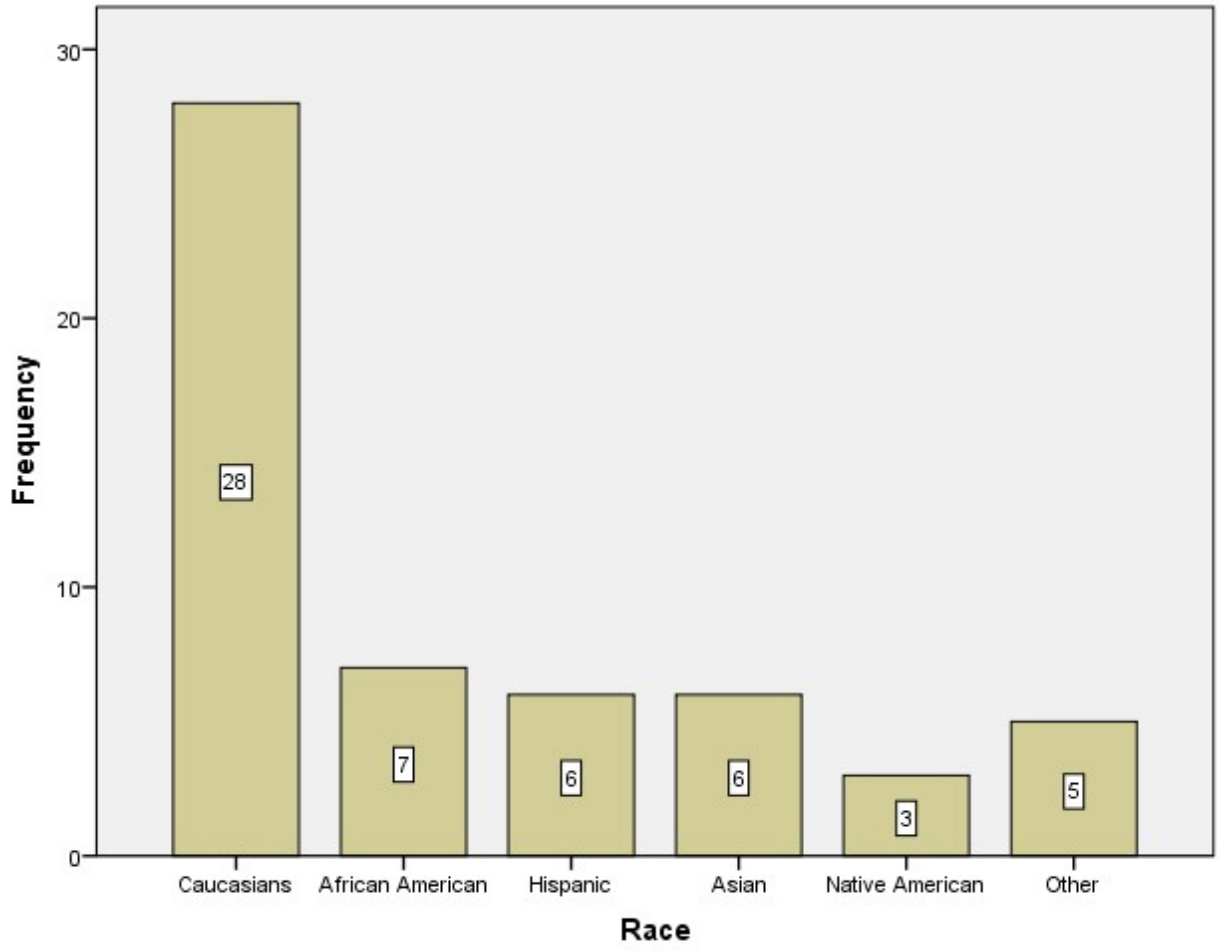

Figure 6. ASO race

Of the 55 ASEs included in this study, 28 were carried out by Caucasians, seven by African Americans, six by Hispanics, six by Asians, three by Native Americans, and five by individuals of other races.

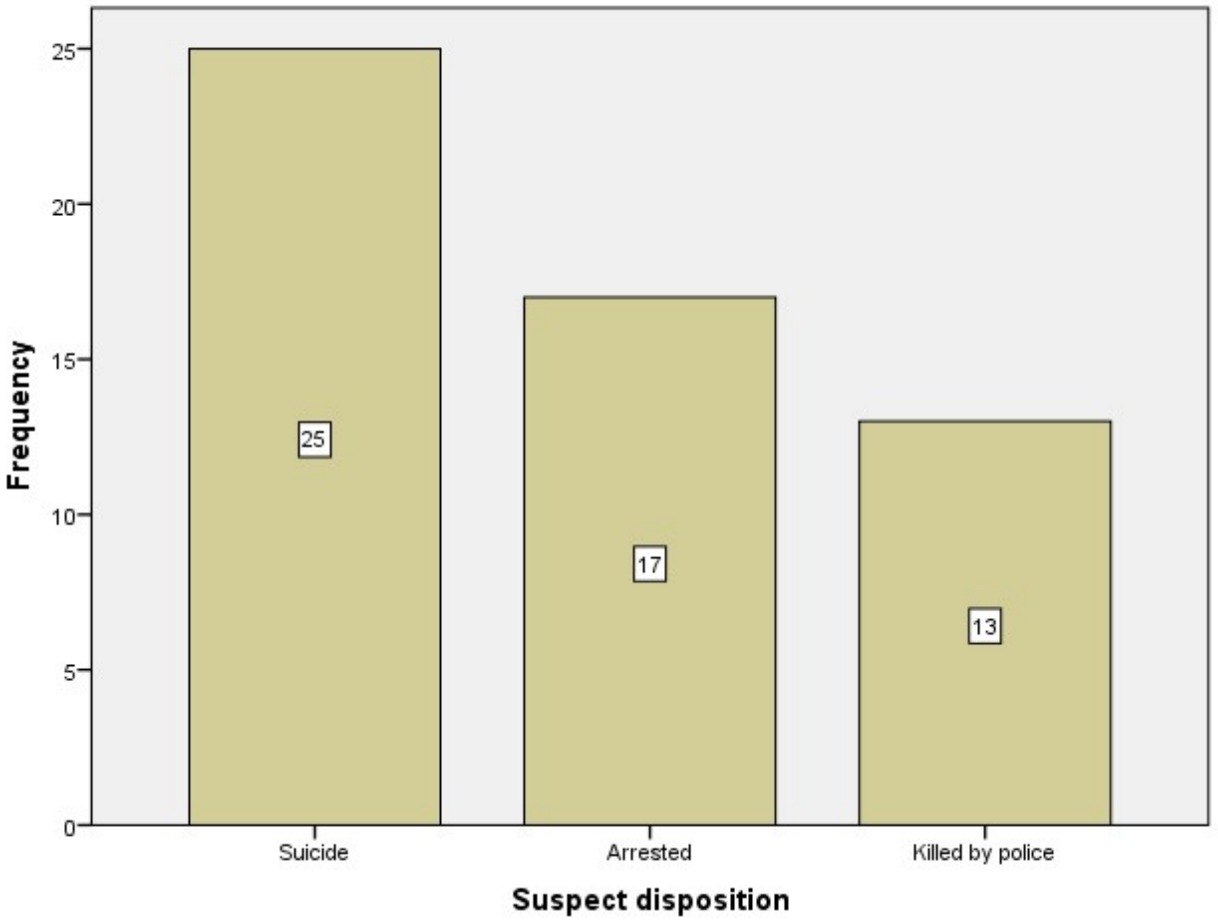

Figure 7. ASO disposition

Of the 55 ASE included in this study, 25 ended with the ASO(s) committing suicide, 17 ended with the arrest of the ASO(s), and 13 ended with the ASO(s) being killed by the police.

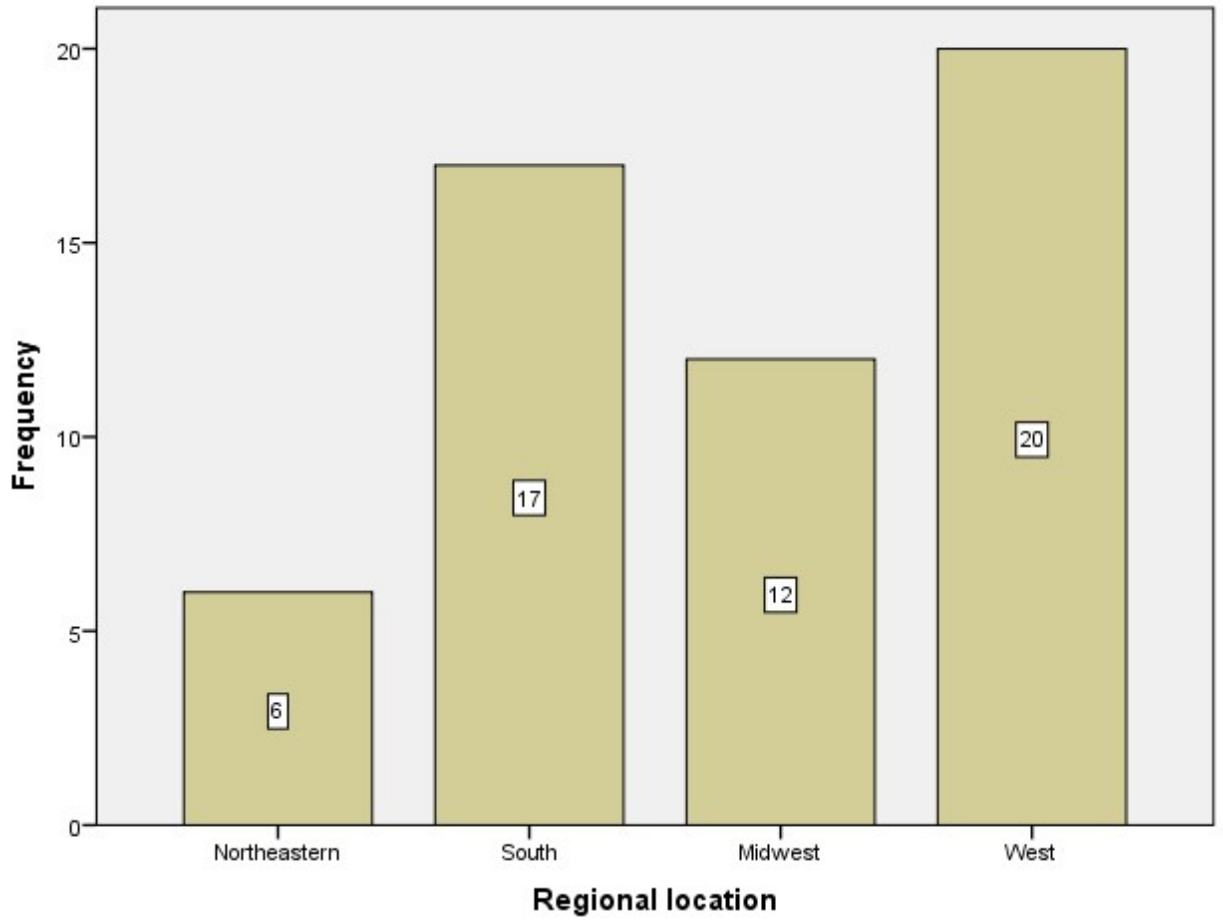

Figure 8. Regional location

Of the 55 included ASEs, six were committed in the Northeastern region, 17 in the Southern region, 12 in the Midwest region, and 20 in the Western region.

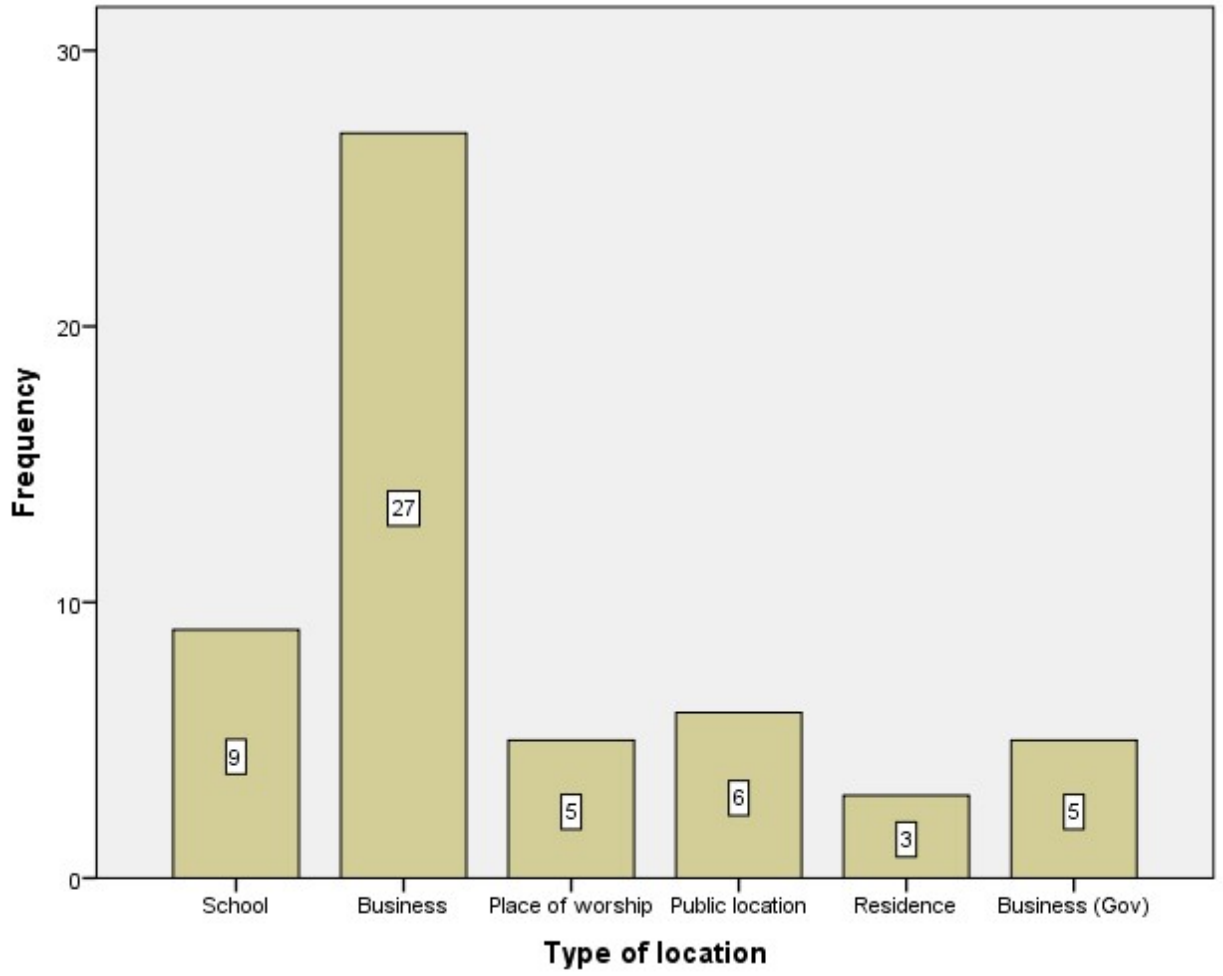

Figure 9. Type of location

Of the 55 included ASEs, nine took place in schools, 27 in businesses, five in places of worship, six in public locations, three in residences, and five in government businesses.

Statistical Assumptions

When conducting a retrospective multiple regression pathway analysis utilizing moderating variables there are 11 statistical assumptions that the data must meet:

Assumption 1: Variables can be measured by interval or ratio:

In this study the levels of measurement for each variable were as followed:

- The rate of media reporting was a ratio variable measured on a continuous scale of 0 to ∞.
- The age of the ASO(s) was a ratio variable measured on a continuous scale of 0 to ∞.
- The casualty rate of an ASE was a ratio variable measured on a continuous scale of 0 to ∞.
- The regional location of each ASE was a nominal variable.

Assumption 2: There is a linear relationship between variables:

I conducted graphing to evaluate the linear relationship between variables (see Figures 10-12). The result of this analysis revealed a week linear relationship between the independent, moderating, and dependent variables. The strength of the relationships was influenced by the inclusion of outliers. To protect the integrity of the data and to ensure that the findings of the study were reflective of the actual impact of the independent, and moderating variables on the dependent variable data transformation techniques, that would have addressed outliers, were not used.

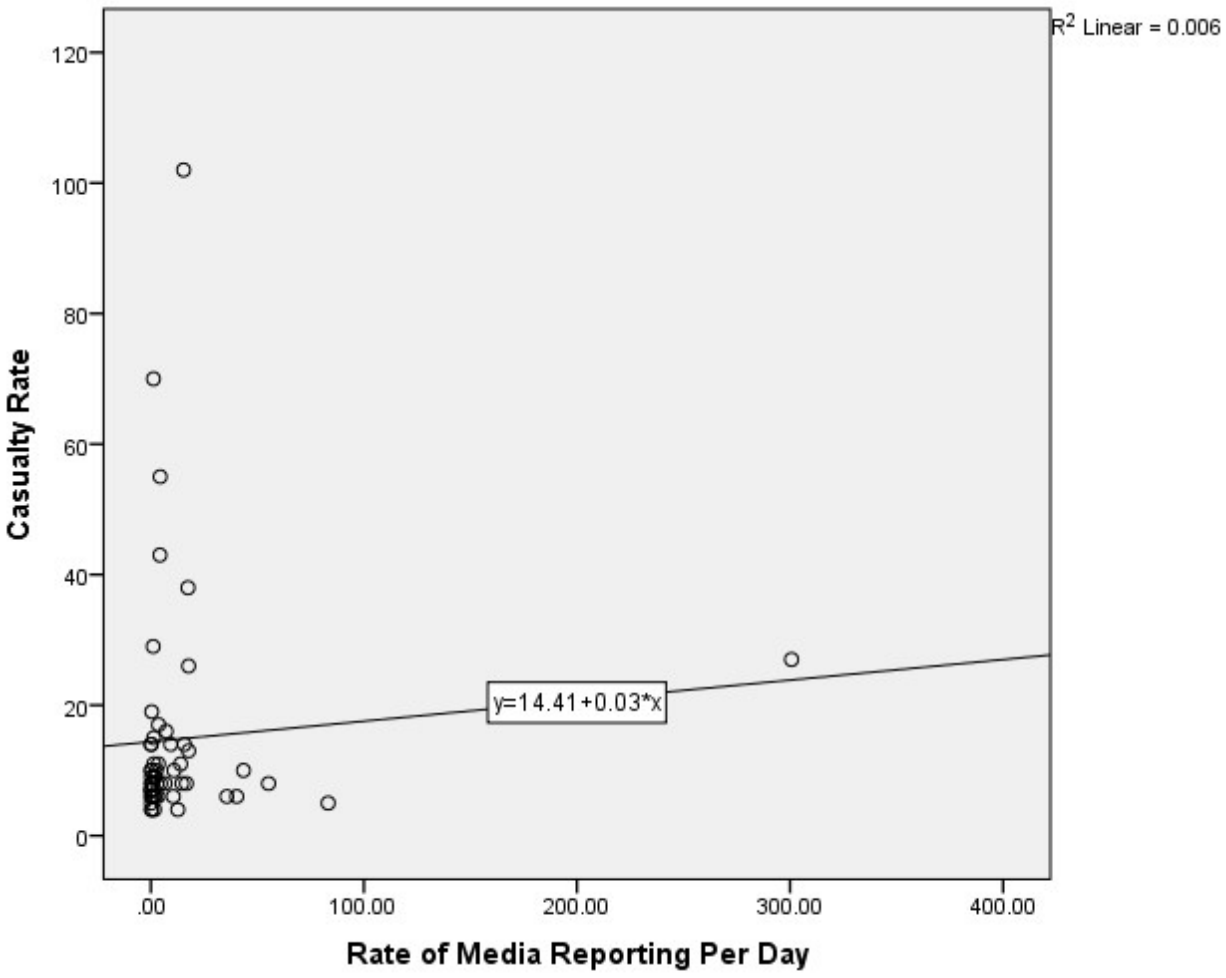

Figure 10. Linear relationship: Casualty rate of the subsequent ASE and rate of news media reporting

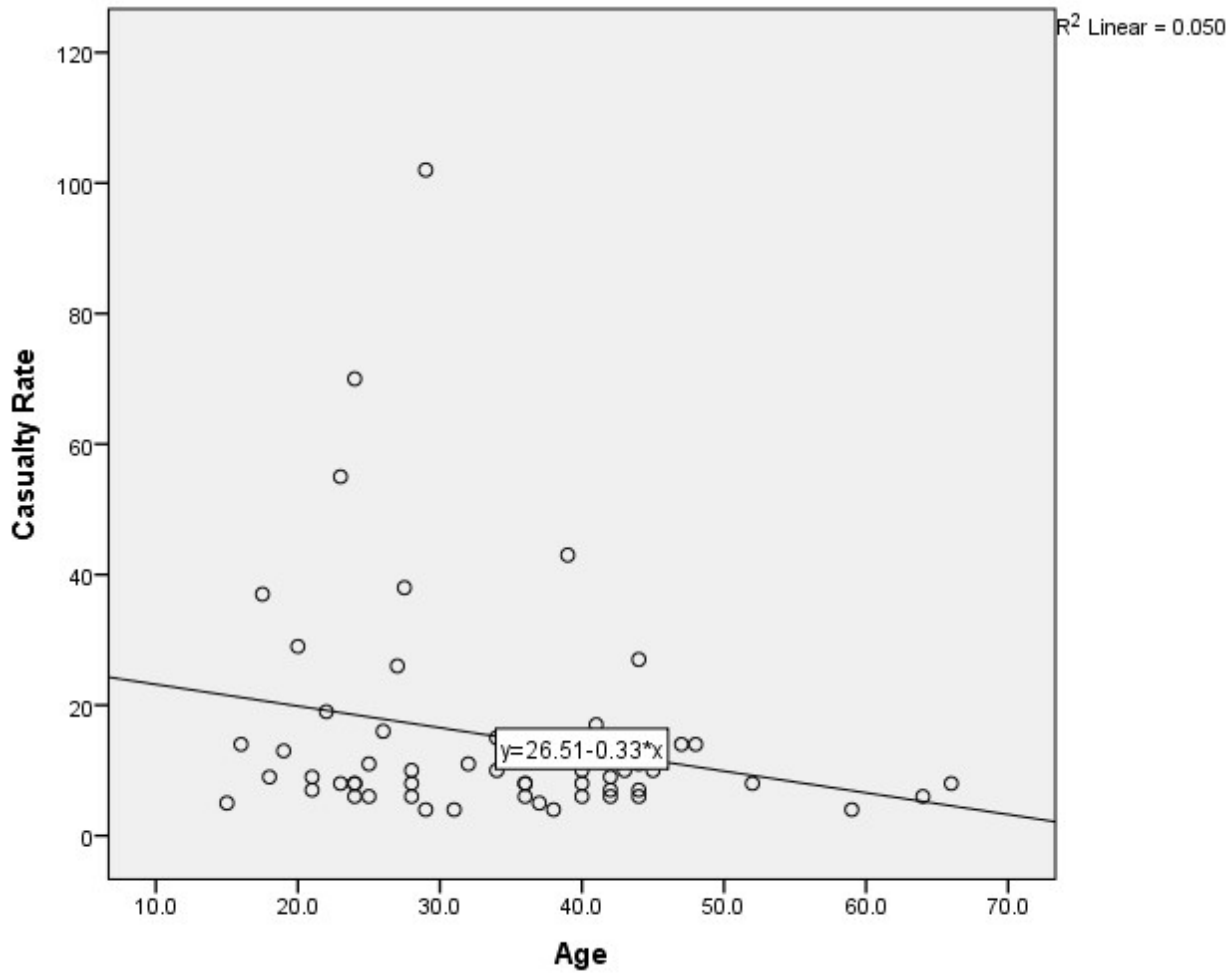

Figure 11. Linear relationship: Casualty rate of the subsequent ASE and age

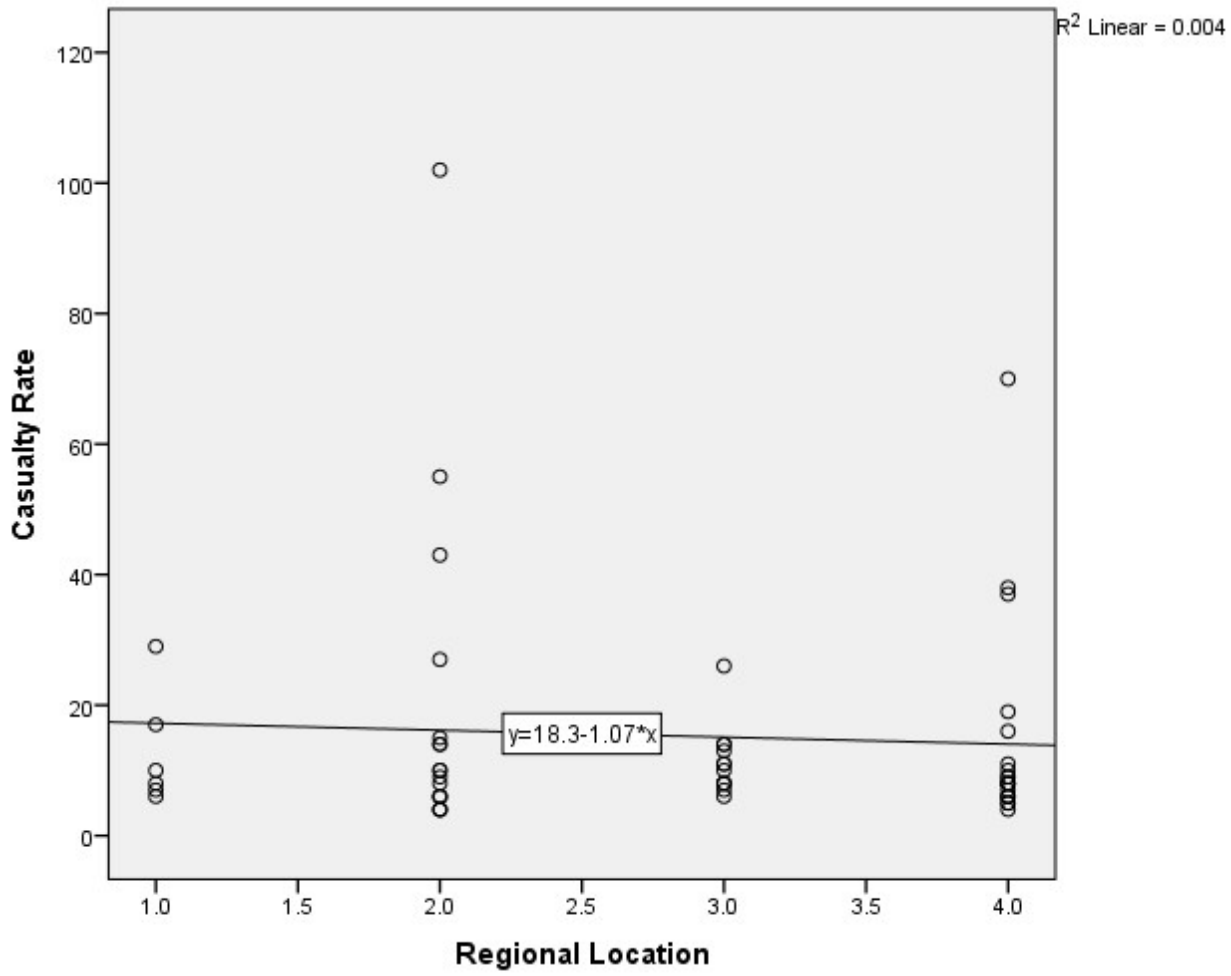

Figure 12. Linear relationship: Casualty rate of the subsequent ASE and location

Assumption 3: Variables are measured without error:

The applied methodology and the use of an intercoder process was designed to ensure the variables were measured consistently and with minimal errors. The rate of media reporting was calculated by dividing the total number of media reports by the number of days between events. The total number of media reports between ASEs was calculated by adding the results of the ProQuest Central database search to the results of the Google News search. The Excel formula function was used to calculate both the total

number of media reports and the rate of media reporting. The formula =SUM(S#:U#), when the S cell equals the approximate number of ProQuest Central database results, and the U cell equals the approximate numbers of Google News results, was used to calculate the total number of media reports. The formula =V#/W#, when V cell equals "Total number of reports" and W cell equals "Number of days between ASEs," was used to calculate the rate of the media reporting. Because it is hypothesized that the rate of media reporting about an ASE impacts the severity of the subsequent ASE, the rate of media reporting of a previous ASE was associated with the subsequent ASE.

The BIs that used to search for news media reports could have resulted in errors that would have impacted the calculation of the news media reporting rate. My initial list of BIs was pared down because the larger initial list of BIs created inconsistencies in the search results. The reduction of BIs, to achieve consistency in the searches, resulted in the tallying of an approximate number of reports rather than an exact number. The included news media reports where directly related to each event, rather than casually, which served reduce the number of errors that would have otherwise existed via the inclusion unrelated news reports. I believed that an accurate approximation of the news media reporting rate was more import to the validity of study then the inclusion of unrelated news media reports that would have resulted from boarder search criterion.

I used the Blair and Schweit (2014) Crime Prevention Research Center (2014), Everytown for Gun Safety (2012), Follman, Aronsen, Pan, and Caldwell (2012), and the New York City Police Department, Counterterrorism Bureau (2012) studies to create a preliminary list of MPSs occurring in the United States between April 20, 1999 and June

15, 2016. I used BIs to search the ProQuest Central database wire feed/newspaper/blog/podcasts/website archives and Google News to ensure that the initial list was complete. I also used data collected during the event classification stage of the intercoder process to determine the age and regional location of each ASO and the mortality and injury rate of each ASE.

Seventy-seven MPS were identified by searching the Internet and ProQuest Central database wire feed/newspaper/blog/podcasts/website archives and were measured without error. Three intercoders were used to evaluate the MPS list. Each intercoder independently evaluated each event to determine if the event met my operational definition of an ASE, after which the intercoders conferred. MPSs that were unanimously categorized as ASEs by the intercoders were included in the final data set. When the intercoders could not reach a unanimous decision, a consensus was sought. When a consensus could not be reached, the event was excluded, and its exclusion was documented. By including an intercoder process utilizing three intercoders, two of which did not have a vested interest in the study, researcher basis related error was eliminated.

Assumption 4: Unknown or excluded variables have an unknown effect on the dependent variable:

I accounted for this assumption by including a “d” variable in the proposed pathway analysis. By noting the awareness of unknown variables such as the type of weapon used, law enforcement response times to an ASE, the distance to hospitals, demographics of victims, etc. the impact of these variables were controlled for and are noted by the inclusion of the “d” variable in the pathway analysis design.

Assumption 5: The relation between the moderating/mediating variables and the criterion variables is significant:

I used SPSS to conduct a correlation analysis using Spearman's correlation coefficient and bootstrapping to test this assumption. Because a Spearman's correlation was conducted nominal variables where not included in this analysis. There was not significant relationship between, the rate of news media reporting about and ASE, age of the ASO, and the casualty rate of the subsequent ASE (see Table 7).

Table 7

Spearman's Correlation Analyses

Variable	Casualty rate	Age	Rate of media reporting
Casualty rate	1	-.176 [-.40, .09]	.184 [-.082, .451]
Age	-.176 [-.404, .097]	1	.041 [-.237, .312]
Rate of media reporting	.184 [-.08, .45]	.041 [-.237, .312]	1

Assumption 6: The dependent variable is continuous:

The dependent variable was a ratio variable measured on a continuous scale of 0 to ∞.

Assumption 7: The specified relationship between the variables is correct:

Correlation analysis and graphing using SPSS software determined the specified relationship between the variables was incorrect resulting in the retention of the null hypotheses (see Table 7 and 8).

Assumption 8: There is no or little multicollinearity:

A collinearity analysis was conducted using SPSS software. Table 8 reflects the results of this analysis and the existence of little of no multicollinearity

Table 8

Collinearity Diagnostics

		Variance propositions		
Dimension	Eigenvalue	Regional location	Age	Rate of media reporting
1	2.989	.01	.01	.02
2	.848	.01	.00	.96
3	.132	.45	.35	.02
4	.031	.53	.63	.00

Assumption 9: Variables are normally distributed:

SPSS software was used to test the distribution of the independent, moderating, and dependent variables. Because outliers were expected and discovered (see Table 9) Spearman's correlation analysis was used to measure the correlation between the independent/moderating variable, age, and dependent variable (Wheelan, 2013).

Table 9

Test of Normal Distribution

Variable	Skewness statistic	Standard error	Standard error (Bootstrap)	Normal distribution
Regional location	-.228	.325	-.635	Yes
Age	.654	.325	-.045	No
Rate of media reporting	6.04	.325	1.873	No
Casualty rate	3.345	.325	1.862	No

Assumption 10: Residual Independence is assumed.

SPSS software was used to test the residual independence of the variables (see Figure 13). The results of the analyses were that the assumption of residual independence was violated. Because of the small sample size (N =54) and the preplanned inclusion of outliers the violation of this assumption was not considered a factor when considering additional analysis.

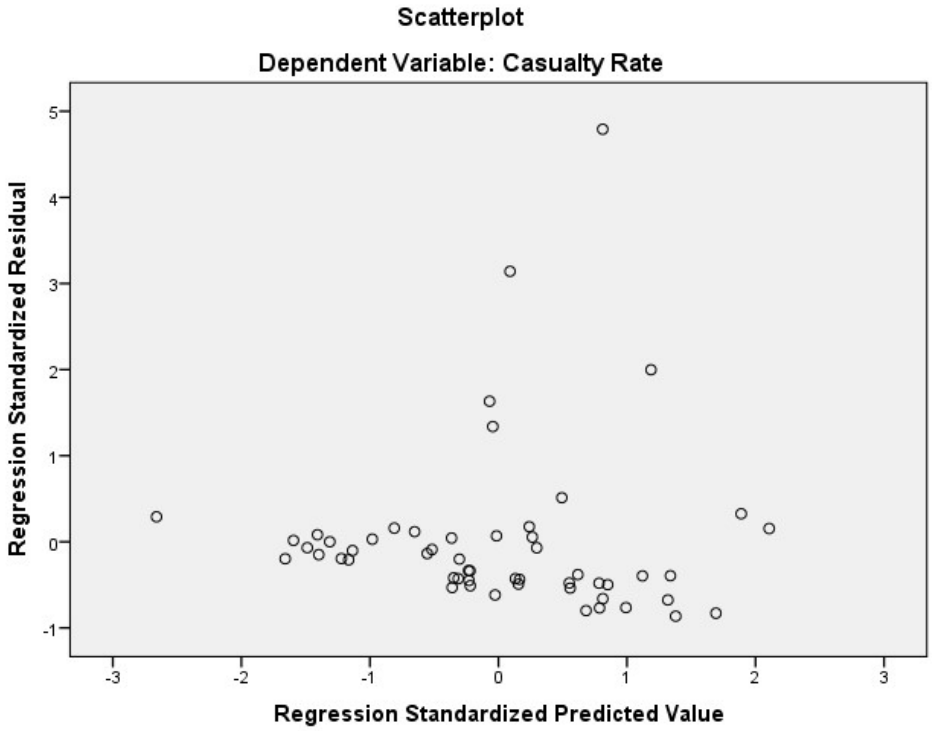

Figure 13. Test of residual independence

Assumption 11: Homoscedasticity exist.

SPSS software was used to test for homoscedasticity. A scatterplot analysis revealed that the residuals where not equally distributed along the regression line and therefore homoscedasticity did not exist. Because no significant relationships were discovered, a pathway analysis was not attempted. Similarly, because the data lacked a linear relationship between independent, moderating and dependent variables, homoscedasticity, residual independence, a significant relationship, and the use of a nominal variable a linear regression analysis was not appropriate.

A final analysis of the dataset led to the hypothesis that the number of news media reports about and ASE prior to the ensuing event correlated with the mortality and/or casualty rate of the ASE. A stronger linear relationship and a positive correlation were

found between these variables. These results infer that when and ASE as a high mortality or casualty rate the event will receive more media attention then an ASE with a lower mortality or casualty rate (see Figures 14-15 and Table 10).

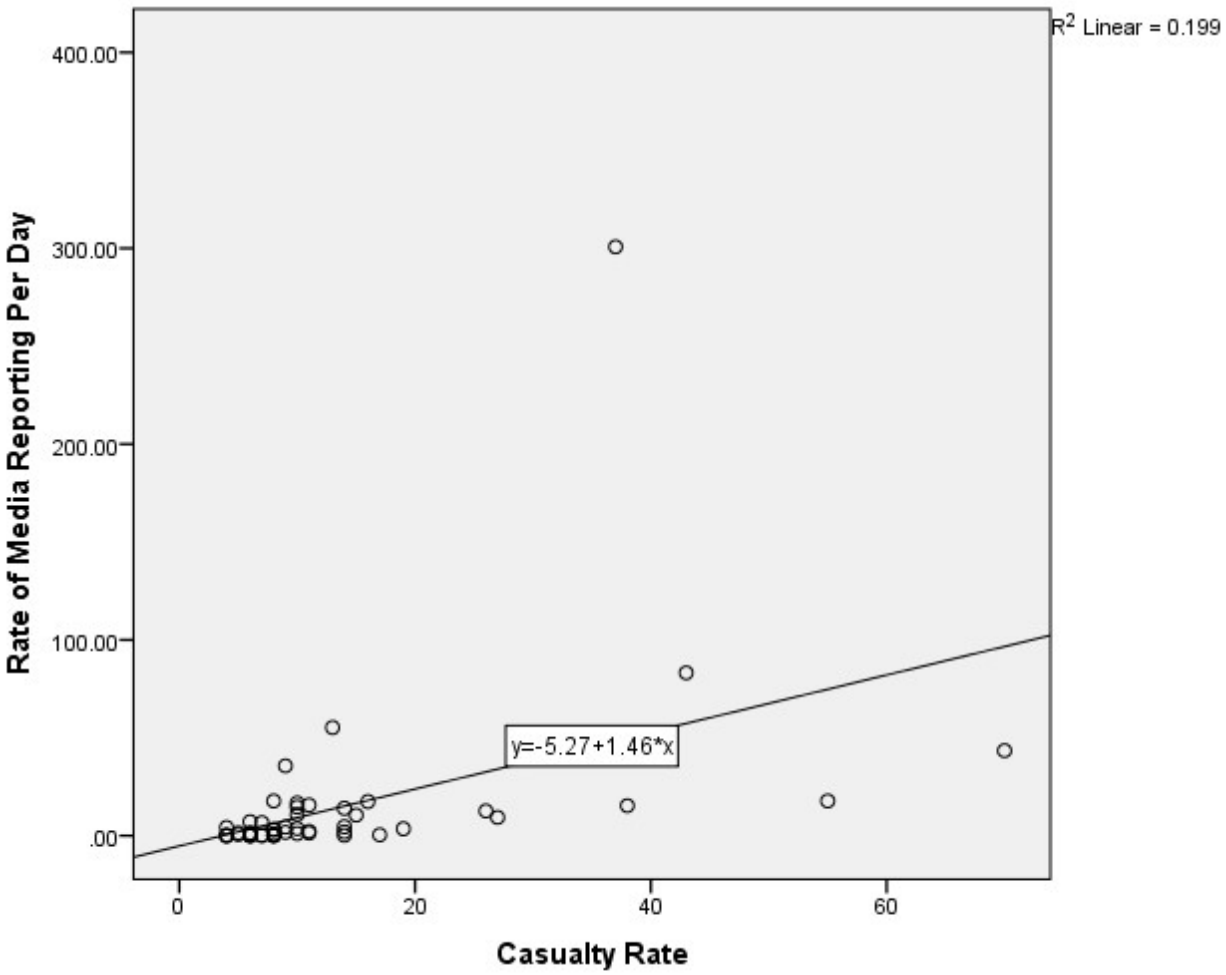

Figure 14. Linear relationship: Casualty rate and number media reports

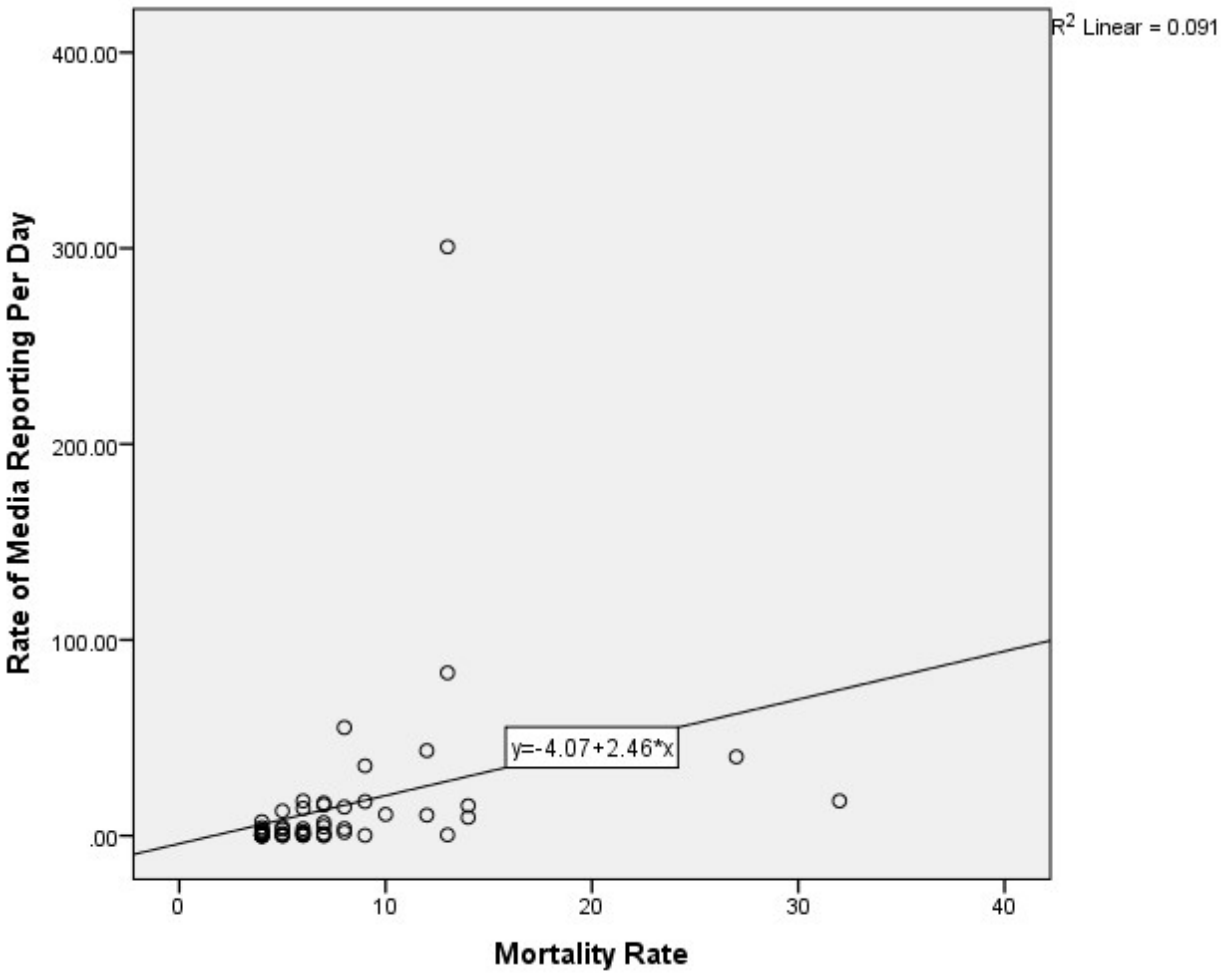

Figure 15. Linear relationship: Mortality rate and number of media reports

Table 10

Media Reporting Rates and Mortality/Casualty Rates

Variable	Casualty rate	Mortality rate	News media reporting rate
Casualty rate	1	.755* [.58, .87]	.662* [.48, .79]
Mortality rate	.755* [.58, .87]	1	.598* [.36, .75]
Rate of media reporting	.662* [.48, .79]	.598* [.36, .75]	1

Note. * $p < .01$. Upper and lower confidence intervals are rounded to .00**.**

Summary

Based on my statistical analysis of the data, the null hypotheses were retained as follows:

1. Between April 20, 1999, and June 15, 2016, there is not a relationship between the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.
2. Between April 20, 1999, and June 15, 2016, there is not a relationship between the age of the subsequent ASO, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.
3. Between April 20, 1999, and June 15, 2016, there is not a relationship between the regional location of the subsequent ASE, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.

4. Between April 20, 1999, and June 15, 2016, there is not a relationship between the age of the subsequent ASO, the regional location of the subsequent ASE, the number of news media reports about an ASE, and the casualty rate of the subsequent ASE in the United States.

Although, the null hypotheses were retained the results of this study still offers creditable and applicable knowledge to the field of ASE research. Chapter 5 will describe the significant 'take-aways' gleaned from this study as well as the probable impact of this analysis on the LEO belief that ASOs have used news media reports about previous events to develop more effective methods, which resulted in a 150% increase in ASE casualty rates between 2009 and 2013 (U.S. Department of Justice, 2013).

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this study was to determine the degree to which the number of news media reports about an ASE impacts the casualty rate of the subsequent ASE in the United States between April 20, 1999, and June 15, 2016. The impact of the age and regional location of the subsequent ASO on that relationship was also analyzed. During this study, I: (a) developed a list of MPS that met my operational definition of an ASE, (b) determined the number of news media reports about an ASE prior to the ensuing event, (c) determined the regional location of each ASE, (d) determined the age of the each ASO(s), and (e) measured the degree of variance between ASEs casualty rates

ASO researchers have not studied the relationship between the number of news media reports about an ASE and the casualty rate of subsequent ASE even though LEOs commonly believe there is a relationship (see Chesbro, 2012; Kissner, 2015; Page, Daniels, & Craig, 2015; Schunk, 2012; Siegert & Siegert, 2013). Because there is circumstantial evidence to support this commonly held LEOs belief that ASOs learn from news media reports about ASEs and uses that knowledge to become prolific murderers I conducted this study (see Bushman, Gollwitzer, & Cruz, 2015; Saul & Fredericks, 2013; Siegert & Siegert, 2013). The confirmation or the rejection of this LEO belief will help law enforcement agencies make decisions related to training, resource allocation, and ASE intervention or prevention strategies.

At the conclusion of this study the null hypothesis where retained. There was not a significant relationship between the age and regional location of the subsequent ASO,

and the rate of news media reporting about an ASE, and the casualty rate of the subsequent ASE. Finally, I found a significant relationship between the number of ASE news media reports and the mortality and casualty (mortality rate plus injury rate) rate of the ASE. This relationship may help to explain why some ASO(s) were obsessed with certain mass murders prior to committing an ASE (see Siegert & Siegert, 2013).

Interpretation of the Findings

I found no significant statistical relationship between the number of the news media reports about an ASE and the casualty rate of the subsequent event. The age of the ASO did not impact the relationship between the independent and dependent variable (see Tables 9). Although, the number of news media reports about an ASE correlated with the mortality and casualty rate of the event (see Table 10).

Based on social learning and social cognitive theory (Bandura, 1977; Bandura, 2001; Schunk, 2012), I theorized that individuals learn about ASEs and ASOs from news media reports. Furthermore, I theorized that the obsession of ASOs with previous ASEs, as documented in the Columbine High School, VPI and State University, and the Sandy Hook Elementary ASEs (Siegert & Siegert, 2013), supports my theory that ASOs are seeking out information about previous ASOs. These facts, when combined with the correlation that I found between ASE severity and the number of news media reports about the ASE prior the ensuing event, exemplifies the importance of understanding the influence of news media reporting about ASEs on the public, in general, and on potential ASOs, specifically. Although, it has been theorized d that ASOs have obsessed over specific events due to the severity of the event and a desire to *break the record* (Siegert &

Siegert, 2013), a ASOs' obsession with another mass murderer or event may be influenced by the intense news media coverage given to that event rather than the severity of the event itself. This information may help to explain why ASOs have focused on specific events and shed light on the impact of news media reporting on media consumers.

Limitations of the Study

This study was limited by the applied design and methodology. When conducting a retrospective multiple regression pathway analysis using moderating variables, the following limitations exist:

- Causation cannot be assumed based on correlation (Field, 2013; Meehl & Waller, 2002).
- The best model of significances cannot be determined (Meehl & Waller, 2002; Streiner, 2005).
- Models with identical correlations patterns cannot be distinguished (Meehl & Waller, 2002; Streiner, 2005).
- Sample size limits accuracy; the smaller the sample size the less accurate the analysis (Field, 2013).
- The effect of excluded or unknown variables on the dependent variable limits accuracy of correlational relations (Streiner, 2005).
- A significant relationship must exist between more than one variable to conduct a pathway analysis (Streiner, 2005).

When conducting a correlation analysis, the following limitations exist:

- Causation cannot be assumed based on correlation (Field, 2013; Meehl & Waller, 2002).
- Variables cannot be nominal (Field, 2013).

Upon reflection, I believe that the limitations created by the study design were unavoidable due to the nature of the study. The data set did not meet the statistical assumption necessary to conduct a pathway analysis. Due to a lack of a significant relationship between the variables I was not able to conduct any additional analyses of the original variables. A Spearman's correlation was conducted on the original ratio variables: (a) rate of media reporting, (b) age of the ASO, and (c) the casualty rate of the ensuing event. No significant relationship was found between these variables. The only significant relationship discovered was between the casualty (p = .66) and the mortality (p = .58) rate of an ASE and the number of news media reports about the event prior to the subsequent event.

The four most significant limitations of this study were my operational definition of an ASE, the use of a nominal variable, the period studied, and the effectiveness of the employed BIs and search engines used to locate news media reports about ASEs. I defined an ASE as any event in which an individual used a firearm to actively murder or attempt to murder people in a centralized populated area, resulting in the murder of four or more victims by firearm(s) (see Blair & Martindale, 2013; Blair & Schweit, 2014; Everytown for Gun Safety, 2014; Fox & Delateur, 2013; Nekvasil, Cornell, & Huang, 2015; New York City Police Department, Counterterrorism Bureau, 2012; Police Executive Research, 2014). Additionally, MPS that stemmed from gang or drug violence,

pervasive, long-tracked, criminal acts, accidental shootings, public suicides, or did not represent a threat to the public were not categorized as ASEs (see Blair & Martindale, 2013; Blair & Schweit, 2014; Everytown for Gun Safety, 2014; Fox & Delateur, 2013; Nekvasil, Cornell, & Huang, 2015; New York City Police Department, Counterterrorism Bureau, 2012; Police Executive Research, 2014). My operational definition was a limitation because it contained a mortality rate criterion of ≥ 4 as well as the criterion that exclude MPSs caused by other underlying criminal acts. However, by setting these limitations, the included events represent ASEs in the strictest form. By defining ASEs in the strictest manner possible the study aligned with current federal data collection and mass murder research norms and practices.

The regional location of an ASE or ASO was assigned per the U.S. Census Bureau Regions and Divisions with states Federal Information and Processing Standards (FPIS) codes map (U.S. Census Bureau, 2015). Each region was assigned a number. Because the regional locations were assigned a number (1-4) that did not represent and actual value this variable was nominal. The use of a nominal variable with four categories limited the number and type of analysis that could be conducted (Field, 2013). The use of a point-biserial correlation was also considered as a secondary analysis, but was rejected because the nominal variable, regional location was not dichotomous (Field, 2013).

The scope of this study was limited to MPSs occurring in the United States between April 20, 1999, and June 15, 2016 that met my operational definition of an ASE. Based on my review of the literature and my operational definition of an ASE, the number of ASEs occurring in the United States between April 20, 1999, and June 15,

2016, was finite ($N = 55$). Because the number of ASEs occurring in the United States between April 20, 1999, and June 15, 2016, was finite, all known ASEs occurring between those dates were included in this study. The inclusion of all known ASEs between April 20, 1999, and June 15, 2016, limited the results of this study to the included events, inferring that generalization of the findings across all MPSs and/or ASEs is inappropriate.

My operational definition of an ASE and the mortality rate criterion included in the operational definition limited the number of included events. However, since this study included all MPSs meeting my operational definition of an ASE, the relatively small size of the data set did not affect the analysis of the data as would be expected in studies utilizing numerically similar sample sizes (Field, 2013). Furthermore, since a significant relationship was found between mortality rate ($p = .58$) and the number of news media reports related to the event the application of a mortality criterion was an effective cut point.

ASEs occurring in the Unites States after April 20, 1999, were selected because the term ASE and the vast amount of news media attention paid to such events did not occur until after the 1999 Columbine High School MPS, making the date of that event an optimal starting point (see Blair & Martindale, 2013; Blair & Schweit, 2014; New York City Police Department, Counterterrorism Bureau, 2012). Further, 1999 was also selected because of the vast differences in the availability of news media services in the form of the Internet, cable television, and satellite prior to and after 1999. This study was also limited by the exclusion of ASEs that occurred outside of the United States. ASEs

occurring outside of the United States were excluded to avoid differing cultural influences and laws governing public access to crime data that could have impacted the validity of the study.

The use of a date range as an inclusion criterion limited the number of MPSs that could plausibly be categorized as an ASE and in turn limited the number of ASEs included in this study ($N = 55$). Superficially, it appeared to me that the number of Internet news reports about an ASE increased the closer an event occurred to the present. As an example, there were zero Google News reports located relating to the Columbine High School ASE in 1999, and 564 Google News Reports relating to the Inland Regional Center ASE in 2016 (see Table 11). Further, the reporting of a terrorism nexus in the Inland Regional Center ASE may have skewed the news media reporting rate (Berman, Izadi, & Lowery, 2015). Based on this observation I believe that Internet accessibility or popularity and the nature of the news media reporting i.e. terrorism vs. ASE should be studied as a variable in the future.

Table 11

News Media Reports: Columbine and Inland Regional Center

ASE	ProQuest Central	Google News	Total	Percentage of Google News*
Columbine High School	30073	0	30073	0
Inland Regional Center	2398	564	2962	19

* Percentage rounded to the nearest 10th

Finally, this study was limited by my ability to locate news media reports about each ASE. The selection of BIs, databases, data filters, and the effectiveness of Internet

search engines, limited the number of news media reports included in this study to those that were contained in the ProQuest Central database and available to the Google search engine via the Google News tab. The included news media reports were further limited by the ability of the selected BIs to locate all available media news reports with in the ProQuest Central database and on the Internet through the Google News search engine.

In retrospect, the limitations posed by the search methodology represented the greatest risk to the results of this study. Due to the inconsistency in the search results generated using my initial list of BIs, the list had to be pared down. In the end, the BIs most often used to locate news media reports specifically related to an ASE were the names of the ASOs and the names of the ASE, i.e. "Harris OR Klebold AND Columbine High School Shooting" The reduction in BIs to garner more specific results resulted in the tallying of an approximate number of reports rather than an exact number. Towards that end, the number of news media reports and the news media reporting rates were also approximated. Although, the use of a customized sophisticated search spider would have increased the accuracy of the search results, the creation and application of such a software application was beyond the limits of this study. However, the results of the study are valid based on the application of identical search methodologies for each ASE. By doing so, I believe that the rate of inclusion or exclusion of available news media reports was consistent across the study ensuring statistical accuracy.

Recommendations

The results of this study reveal that there is a significant relationship between the mortality rate and casualty rate of ASEs and the number of news media reports about the

event. Based on social learning and social cognitive theory, I theorized that individuals are learning from news media reports (see Bandura, 1977; Bandura, 2001; Schunk, 2012). Further, the obsession of ASOs with other mass murderers, as documented in the Columbine High School, VPI, and State University, the Sandy Hook Elementary ASEs (Siegert & Siegert, 2013), supports theory that ASOs are seeking out information about other mass murderers. Future studies relating to the effect of news media reports about ASEs should include an evaluation of the type of information ASOs are accessing about mass murderers and if or how that information is being operationalized, i.e. motivational, inspirational, adaption of tactics, etc.

Implications

The results of this study highlight the reality of media reporting and ASEs, specifically, that the number of news media reports about an ASE is positively related to the number of casualty ($p = .66$) occurring during the event. When this information is paired with data supporting the obsession of the some of the most prolific ASOs in United States history with other mass murderers it supports the creation of ASE news media reporting guidelines that are like suicide news media reporting guidelines proposed by the CDC and their partners. Through the application of media reporting guidelines, positive social change at the societal level, reflected in fewer ASEs or lower ASE casualty rates, could be achieved.

The data collected in this study also offers insight into the effectiveness of firearm control legislation. Between April 20, 1999, and June 15, 2016, an ASE occurred in every region within the United States; the majority occurring in the West (see Table 10). ASEs

have occurred in 27 states and one district, including states with some of the strictest firearm control legislation and lowest overall homicide rates (see Fleeger et al. 2013). Based on this data, the implementation of firearms controls legislation in an attempt to limit the likelihood of or to reduce the casualty rate of ASE has been relatively ineffective. This information suggests that as a society, we need to rethink our approach to ASE intervention via firearms control legislation and consider applying those same resources and efforts to other intervention and prevention strategies. The reallocation of resources, towards new intervention and prevention strategies, could create social change at the societal level by reducing the rate of ASEs or by reducing the casualty rate.

Future Research Recommendation

Based on the significant findings of this study I recommended that future research focus on determining how ASOs are affected by news media reports about ASEs, when there is evidence that the ASOs were aware of or obsessed with those reports. Case studies evaluating the media habits of ASOs such as, Harris and Klebold, Cho, and Lanza, who had a documented obsession with mass murderers and ASOs, would add to this area of research. These offenders and events also coincide with the significant findings of this study because each of these ASEs had high casualty rates and received a large number of media attention (see Table 12).

Table 12

Future Case Studies

ASO	Casualty rate	Total number of reports	News media reporting rate
Harris and Klebold	37	30,073	300.73
Cho	55	4138	17.76
Lanza	29	3585	40.28

Note: Casualty rate (*M* =15.27, *SD 17.6*). News media reporting rate (M = 14.5, *SD* 42.7).

When considering that the null hypotheses were retained in this study, it is recommended that future research regarding the impact of news media reports on the severity of ASEs focuses on developing a more accurate and complete means of counting the number of news media reports related to an event. Calculating a more accurate news media reporting rate will likely require the use of or the development of a complex search spider and plausibly the development of an algorithm that would account for the differences in media availability from year to year and the differences in elapsed time between events. Although, these suggestions were outside of the scope of this study the application of these suggestions in future research would more clearly define any relationship between news media reporting rates and the severity of ASEs.

To ensure that this study reflected current federal data collection methodology, a mortality criterion of ≥ 4 was used to categorize an MPS as an ASE. However, because the term Active Shooter is more descriptive of the law enforcement response to a shooting then to the type of event it is recommended that future researchers consider whether a mortality criterion is relevant when defining ASEs or not. Therefore, as carried out in this study, it is curial that future ASE researchers carefully consider categorization

criterion when undertaking similar research. The lack of a mortality criterion in this study would have undoubtedly increased the sample size and in doing so may have altered the results of the statistical analysis. However, as seen in other studies, the use of a less restrictive categorization criterion can complicate rather than simplifying the interpretation of the results.

Finally, using a nominal variable to define a regional location and in turn the regional strength of firearm control legislation should be reconsidered in future studies. It is my recommendation that future researcher develop an effective means of calculating the regional strength of firearm control legislation using an ordinal variable. By doing so, a wider and more accurate verity of analyses tools would be available to the researcher.

Conclusion

As reflected by the 2016 ASEs, in Dallas, Texas, and Orlando, Florida, ASEs will continue to represent a threat to public safety. Although, the mean mortality rate of ASE between April 20, 1999, and June 15, 2016, was 8.36 (SD = 7.62) and the mean injury rate was 7.04 (SD = 11.84) per event, news media outlets will continue to cite ASEs with a casualty rates that are substantially higher than the mean as the rule rather than the exception. Even though, the high casualty rates of these events correlates with the amount of news media attention received by these events, rarely has there been any discussion as to how news media reporting about these events maybe impacting individuals, society and potential ASOs. The impact of ASE reporting cannot be overlooked and research needs to be conducted to determine if the nature of news media reporting about ASEs is impacting the regularity or severity of ASEs. The question then, is not whether news

media outlets should report about ASEs, but how should news media outlets report about them. Finally, there is also a need to educate the public about the differences between mass shootings, mass public shootings, and ASEs as well as the differences between an Active Shooter response by law enforcement and an ASE. Through a clear understanding of these events the public and law enforcement can determine the actual threat posed by ASEs, the regularity of such events, and can be empowered to make empirically supported decisions about resource allocation and effective intervention/prevention measures.

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Appendix A: Active Shooter Events

Case 1: Columbine High School Shooting

Description: Harris and Klebold killed 13 people and wounded 24 during at Columbine High School.

Date:	April 20, 1999
Location:	Columbine High School, Littleton CO
Regional location:	West
Type of location:	School
ASO(s):	Eric Harris and Dylan Klebold
Age:	17.5 (average)
Mortality rate:	13
Injury rate:	24
Casualty rate:	37
ProQuest **C**entral BIs:	(Harris) OR (Klebold) AND (Columbine High School Shooting)
Google News BIs:	Harris OR Klebold AND Columbine High School Shooting

Sources: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 2: Atlanta Day Trading

Description: Barton killed his wife and mother-in-law, and then killed 12 people and wounded 13 others at two different Atlanta day trading firms.

Date:	July 29, 1999
Location:	Atlanta Day Trading, Atlanta GA
Regional location:	South
Type of location:	Business
ASO(s):	Mark Barton
Age:	44
Mortality rate:	14
Injury rate:	13
Casualty rate:	27
ProQuest Central BIs:	(Mark Barton) AND (Atlanta Day Trading Shooting)
Google News BIs:	Mark Barton AND Atlanta Day Trading Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 3: Wedgwood Baptist Church Shooting

Description: Ashbrook was anti-Baptist who killed seven people and wounded seven people at a teen prayer rally.

Date:	September 15, 1999
Location:	Wedgwood Baptist Church, Fort Worth, TX
Regional location:	South
Type of location:	Place of Worship
ASO(s):	Larry Ashbrook
Age:	47
Mortality rate:	7
Injury rate:	7
Casualty rate:	14
ProQuest Central BIs:	(Ashbrook) AND (Wedgwood Baptist Church Shooting)
Google News BIs:	Ashbrook AND Wedgwood Baptist Church Shooting

Source: Everytown for Gun Safety (2014)

Case 4: Xerox Shooting

Description: Uyesugi killed seven co-workers and wounded one other at Xerox, where he worked.

Date:	November 2, 1999
Location:	Xerox, Honolulu, HI
Regional location:	West
Type of location:	Business
ASO(s):	Bryan Uyesugi
Age:	40
Mortality rate:	7
Injury rate:	1
Casualty rate:	8
ProQuest Central BIs:	(Bryan Uyesugi) AND (Xerox Shooting)
Google News BIs:	Bryan Uyesugi AND Xerox Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 5: Radisson Hotel Shooting

Description: Izuierdo-Leyva killed five people and wounded three others near the Radisson Hotel

Date:	December 30, 1999
Location:	Radisson Hotel, Tampa, FL
Regional location:	South
Type of location:	Business
ASO(s):	Silvio Izquierdo-Leyva
Age:	36
Mortality rate:	5
Injury rate:	3
Casualty rate:	8
ProQuest Central BIs:	(Izquierdo-Leyva) AND (Radisson Hotel Shooting)
Google News BIs:	Izquierdo-Leyva AND Radisson Hotel Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 6: Edgewater Technology Shooting

Description: McDemott killed seven people at Edgewater Technology.

Date:	December 26, 2000
Location:	Edgewater Technology, Wakefield, MA
Regional location:	Northeastern
Type of location:	Business
ASO(s):	Michael McDermott
Age:	42
Mortality rate:	7
Injury rate:	0
Casualty rate:	7
ProQuest Central BIs:	(McDermott) AND (Edgewater Technology Shooting)
Google News BIs:	McDermott AND Edgewater Technology Shooting

Source: Everytown for Gun Safety (2014)

Case 7: Navistar Shooting

Description: Baker killed four people and wounded four people at the Navistar facility. Baker was a former Navistar employee.

Date:	February 5, 2001
Location:	Navistar, Melrose Park, IL
Regional location:	Midwest
Type of location:	Business
ASO(s):	William Baker
Age:	66
Mortality rate:	4
Injury rate:	4
Casualty rate:	8
ProQuest Central BIs:	(William Baker) AND (Navistar Shooting)
Google News BIs:	William Baker AND Navistar Shooting

Source: Everytown for Gun Safety (2014)

Case 8: Lockheed Martin Shooting

Description: Williams killed six coworkers and wounded eight others after an ethics and diversity training class.

Date:	July 3, 2003
Location:	Lockheed Martin, Meridian, MS
Regional location:	South
Type of location:	Business
ASO(s):	Douglas Williams
Age:	48
Mortality rate:	6
Injury rate:	8
Casualty rate:	14
ProQuest Central BIs:	(Williams) AND (Lockheed Martin Shooting)
Google News BIs:	Williams AND Lockheed Martin Shooting

Source: Everytown for Gun Safety (2014)

Case 9: Windy City Core Supply Shooting

Description: Tapia returned to Windy City Core Supply six months after being fired and killed six people.

Date:	August 27, 2006
Location:	Windy City Core Supply, Chicago, IL
Regional location:	Midwest
Type of location:	Business
ASO(s):	Salvador Tapia
Age:	36
Mortality rate:	6
Injury rate:	0
Casualty rate:	6
ProQuest Central BIs:	(Tapia) AND (Windy City Core Supply Shooting)
Google News BIs:	Tapia AND "Windy City Core Supply Shooting"

Source: New York City Police Department (2012)

Case 10: ConAgra Food Inc. Shooting

Description: Brown killed five co-workers and wounded two others at the ConAgra Food Inc. plant.

Date:	July 4, 2004
Location:	ConAgra Food Inc., Kansas City, KS
Regional location:	Midwest
Type of location:	Business
ASO(s):	Elijah Brown
Age:	21
Mortality rate:	5
Injury rate:	2
Casualty rate:	7
ProQuest Central BIs:	(Elijah Brown) AND (ConAgra Food Shooting)
Google News BIs:	Elijah Brown AND ConAgra Food Shooting

Source: New York City Police Department (2012)

Case 11: Vang Shooting

Description: Vang killed six hunters and wounded two others after argument over a hunting area.

Date:	November 21, 2004
Location:	Open space, Meteror, WI
Regional location:	Midwest
Type of location:	Public Location
ASO(s):	Chai Vang
Age:	36
Mortality rate:	6
Injury rate:	8
Casualty rate:	14
ProQuest Central BIs:	(Chai Vang) AND (Woods Shooting)
Google News BIs:	Chai Vang AND Woods Shooting

Source: Delong (2012)

Case 12: Damagepian Concert Shooting

Description: During a concert, Gale forced his way on to stage, began shooting, killing four people and wounding seven.

Date:	December 8, 2004
Location:	Damagepain Concert, Columbus, OH
Regional location:	Midwest
Type of location:	Public location
ASO(s):	Nathan Gale
Age:	25
Mortality rate:	4
Injury rate:	7
Casualty rate:	11
ProQuest Central BIs:	(Nathan Gale) AND (Shooting)
Google News BIs:	Nathan Gale AND Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 13: Living Church of God Shooting

Description: Ratzmann open fired in his church killing seven people and wounding four.

Date:	March 12, 2005
Location:	Living Church of God, Brookfield, WI
Regional location:	Midwest
Type of location:	Place of worship
ASO(s):	Terry Ratzmann
Age:	44
Mortality rate:	7
Injury rate:	4
Casualty rate:	11
ProQuest Central BIs:	(Ratzmann) AND (Living Church of God Shooting)
Google News BIs:	Ratzmann AND Living Church of God Shooting

Source: Everytown for Gun Safety (2014)

Case 14: Red Lake Senior High School Shooting

Description: Wise killed his grandfather and his grandfather's companion before going to his high school and killing seven people and wounding five.

Date:	March 5, 2005
Location:	Red Lake Senior High School, Red Lake, MI
Regional location:	Midwest
Type of location:	School
ASO(s):	Jeffrey Weise
Age:	16
Mortality rate:	9
Injury rate:	5
Casualty rate:	14
ProQuest Central BIs:	(Weise) AND (Red Lake Senior High School Shooting)
Google News BIs:	Weise AND Red Lake Senior High School Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 15: Goleta Postal Processing Facility Shooting

Description: San Marco killed her neighbor and then six people at the Goleta Postal Processing Facility.

Date:	January 30, 2006
Location:	Goleta Postal Processing Facility, Goleta, CA
Regional location:	West
Type of location:	Business (GOV)
ASO(s):	Jennifer San Marco
Age:	44
Mortality rate:	7
Injury rate:	0
Casualty rate:	7
ProQuest Central BIs:	(San Marco) AND (Goleta Postal Processing Facility Shooting)
Google News BIs:	San Marco AND Goleta Postal Processing Facility Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 16: Capitol Hill Rave Shooting

Description: Huff killed six people at a rave party.

Date:	March 6, 2006
Location:	Capitol Hill, Seattle, WA
Regional location:	West
Type of location:	Residence
ASO(s):	Kyle Huff
Age:	28
Mortality rate:	6
Injury rate:	2
Casualty rate:	8
ProQuest Central BIs:	(Kyle Huff) AND (Rave) AND (Shooting)
Google News BIs:	Kyle Huff AND Rave AND Shooting

Source: Everytown for Gun Safety (2014)

Case 17: Trolley Square Shooting

Description: Talovic killed five people and wounded four others in Trolley Square.

Date:	February 12, 2007
Location:	Trolley Square, Salt Lake City, UT
Regional location:	West
Type of location:	Public location
ASO(s):	Sulejman, Talovic
Age:	18
Mortality rate:	5
Injury rate:	4
Casualty rate:	9
ProQuest Central BIs:	(Talovic) AND (Trolley Square Shooting)
Google News BIs:	Talovic AND Trolley Square Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 18: Virginia Tech Shooting

Description: Cho killed 32 people and wounded 23 others at the Virginia Polytechnic Institute and State University.

Date:	April 16, 2007
Location:	Virginia Polytechnic Institute and State University, Blacksburg, VA
Regional location:	South
Type of location:	School
ASO(s):	Seung-Hui Cho
Age:	23
Mortality rate:	32
Injury rate:	23
Casualty rate:	55
ProQuest Central BIs:	(Cho) AND (Virginia Tech Shooting)
Google News BIs:	Cho AND Virginia Tech Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 19: Westroads Mall Shooting

Description: Hawkins killed eight and wounded five others during a shooting spree at the Westroads Mall.

Date:	December 5, 2007
Location:	Westroads Mall, Omaha, NB
Regional location:	Midwest
Type of location:	Business
ASO(s):	Robert Hawkins
Age:	19
Mortality rate:	8
Injury rate:	5
Casualty rate:	13
ProQuest Central BIs:	(Hawkins) AND (Westroads Mall Shooting)
Google News BIs:	Hawkins AND Westroads Mall Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 20: New Life Church Shooting

Description: Murray killed four people and wounded four at two different locations associated with New Life Church.

Date:	December 9, 2007
Location:	Youth with a Mission Training Center and New Life Church, CO
Regional location:	West
Type of location:	Place of worship
ASO(s):	Matthew Murray
Age:	24
Mortality rate:	4
Injury rate:	4
Casualty rate:	8
ProQuest Central BIs:	(Matthew Murray) AND (New Life Church) AND (Shooting) AND (Colorado Springs) NOT (Obituaries)
Google News BIs:	Matthew Murray AND New Life Church AND Shooting AND Colorado Springs

Source: New York City Police Department (2012)

Case 21: Kirkwood City Council Shooting

Description: Thornton killed six people and wounded two at a city council meeting.

Date:	February 7, 2008
Location:	Kirkwood City Council, Kirkwood, MO
Regional location:	Midwest
Type of location:	Business (GOV)
ASO(s):	Charles Thornton
Age:	52
Mortality rate:	6
Injury rate:	2
Casualty rate:	8
ProQuest Central BIs:	(Thornton) AND (Kirkwood City Council Shooting)
Google News BIs:	Thornton AND Kirkwood City Council Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 22: Northern Illinois University Shooting

Description: Krazmierczak killed five, wounded 21 (17 by gunfire) at Northern Illinois University after his program canceled.

Date:	February 14, 2008
Location:	Northern Illinois University, DeKalb, Il
Regional location:	Midwest
Type of location:	School
ASO(s):	Steven, Kazmierczak
Age:	27
Mortality rate:	5
Injury rate:	21
Casualty rate:	26
ProQuest Central BIs:	(Kazmierczak) AND (Northern Illinois University Shooting)
Google News BIs:	Kazmierczak AND Northern Illinois University Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014).

Case 23: Black Road Auto Wrecking Shooting

Description: Leeds killed his father, two co-workers and a customer.

Date:	March 19, 2008
Location:	Black Road Auto Wrecking, Santa Maria, CA
Regional location:	West
Type of location:	Business
ASO(s):	Lee Leeds
Age:	31
Mortality rate:	4
Injury rate:	0
Casualty rate:	4
ProQuest Central BIs:	(Leeds) AND (Black Road Auto Wrecking Shooting)
Google News BIs:	(Leeds) AND (Black Road Auto Wrecking Shooting)

Source: New York City Police Department (2012)

Case 24: Atlantis Plastics Shooting

Description: Higdon killed six people and wounded one other after being reprimanded by a supervisor.

Date:	June 25, 2008
Location:	Atlantis Plastics, Henderson, KY
Regional location:	South
Type of location:	Business
ASO(s):	Wesley Higdon
Age:	25
Mortality rate:	5
Injury rate:	1
Casualty rate:	6
ProQuest Central BIs:	(Higdon) AND (Atlantis Plastics Shooting)
Google News BIs:	Higdon AND Atlantis Plastics Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 25: City of Kinston Shooting

Description: McLendon killed 10 people, including five family members at three different locations.

Date:	March 10, 2009
Location:	City of Kinston, Geneva County,AL
Regional location:	South
Type of location:	Residence
ASO(s):	Michael McLendon
Age:	28
Mortality rate:	10
Injury rate:	0
Casualty rate:	10
ProQuest Central BIs:	(McLendon) AND (Shooting)
Google News BIs:	McLendon AND Shooting

Source: Everytown for Gun Safety (2014)

Case 26: Pinelake Health and Rehabilitation Center Shooting

Description: Stewart killed eight residents and wounded two at the Pinelake Health and Rehabilitation Center where his wife worked.

Date:	March 29, 2009
Location:	Pinelake Health and Rehabilitation Center, Carthage, NC
Regional location:	South
Type of location:	Business
ASO(s):	Robert Stewart
Age:	45
Mortality rate:	8
Injury rate:	2
Casualty rate:	10
ProQuest Central BIs:	(Stewart) AND (Pinelake Health and Rehabilitation Center Shooting)
Google News BIs:	Stewart AND Pinelake Health and Rehabilitation Center Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 27: American Civic Association Immigration Center Shooting

Description: Wong killed 13 people and wounded three others.

Date:	April 3, 2009
Location:	American Civic Association Immigration Center Shooting, Binghamton, NY
Regional location:	Northeastern
Type of location:	Business
ASO(s):	Jiverly Wong
Age:	41
Mortality rate:	13
Injury rate:	4
Casualty rate:	17
ProQuest Central BIs:	(Wong) AND (American Civic Association Immigration Center Shooting)
Google News BIs:	Wong AND American Civic Association Immigration Center Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 28: Television Store Shooting

Description: Chavez-Gonzalez killed four people outside of a TV Store.

Date:	June 6, 2010
Location:	Mount Airy, NC
Regional location:	South
Type of location:	Public Location
ASO(s):	Marcos, Chavez-Gonzalez
Age:	29
Mortality rate:	4
Injury rate:	0
Casualty rate:	4
ProQuest Central BIs:	(Marcos Chavez-Gonzalez) AND (Shooting)
Google News BIs:	Marcos Chavez-Gonzalez AND Shooting

Source: Everytown for Gun Safety (2014) and Crime Prevention Research Center (2014)

Case 29: Fort Hood Shooting

Description: Hasan targeted soldiers at Ft. Hood, killing 13 and wounding 30 others.

Date:	November 5, 2009
Location:	Fort Hood, TX
Regional location:	South
Type of location:	Business (GOV)
ASO(s):	Nidal, Hasan
Age:	39
Mortality rate:	13
Injury rate:	30
Casualty rate:	43
ProQuest Central BIs:	(Hasan) AND (Fort Hood Shooting)
Google News BIs:	Hasan AND Fort Hood Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 30: Forza Coffee Shop Shooting

Description: Clemmons targeted and killed four police officers in a coffee shop.

Date:	November 29, 2009
Location:	Forza Coffee Shop, Parkland, WA
Regional location:	West
Type of location:	Business
ASO(s):	Maurice Clemmons
Age:	37
Mortality rate:	4
Injury rate:	1
Casualty rate:	5
ProQuest Central BIs:	(Clemmons) AND (Forza Coffee Shop Shooting)
Google News BIs:	Clemmons AND Forza Coffee Shop Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 31: Galstyan Shooting

Description: Galstyan killed four people and wounded two others after an argument.

Date:	April 3, 2010
Location:	Los Angeles, CA
Regional location:	West
Type of location:	Business
ASO(s):	Nerses, Galstyan
Age:	28
Mortality rate:	4
Injury rate:	2
Casualty rate:	6
ProQuest Central BIs:	(Nerses Galstyan) AND (Shooting)
Google News BIs:	Nerses Galstyan AND Shooting

Source: Everytown for Gun Safety (2014) and Crime Prevention Research Center (2014)

Case 32: Yoyito-Café Shooting

Description: Regalado killed his wife in the parking lot of the Yoyito-Café before entering the café and killing three others.

Date:	June 6, 2010
Location:	Yoyito-Café, Hialeah, FL
Regional location:	South
Type of location:	Business
ASO(s):	Gerardo Regalado
Age:	38
Mortality rate:	4
Injury rate:	0
Casualty rate:	4
ProQuest Central BIs:	(Regalado) AND (Yoyito-Café Restaurant Shooting)
Google News BIs:	Regalado AND Yoyito-Café Restaurant Shooting

Source: New York City Police Department (2012), Everytown for Gun Safety (2014), and Crime Prevention Research Center (2014)

Case 33: Hartford Beer Distributor Shooting

Description: Thronton killed eight people and wounded two others after agreeing to resign for theft.

Date:	August 3, 2010
Location:	Hartford Beer Distributor
Regional location:	Northeastern
Type of location:	Business
ASO(s):	Omar Thornton
Age:	34
Mortality rate:	8
Injury rate:	2
Casualty rate:	10
ProQuest Central BIs:	(Thornton) AND (Hartford Beer Distributor Shooting)
Google News BIs:	Thornton AND Hartford Beer Distributor Shooting

Source: New York City Police Department (2012), Everytown for Gun Safety (2014), and Crime Prevention Research Center (2014)

Case 34: McCray Shooting

Description: McCray, began shooting into a crowd after an argument over spilled champagne. Four people were killed and four were wounded.

Date:	August 14, 2010
Location:	Buffalo, NY
Regional location:	Northeastern
Type of location:	Public location
ASO(s):	Riccardo, McCray
Age:	24
Mortality rate:	4
Injury rate:	4
Casualty rate:	8
ProQuest Central BIs:	(Riccardo McCray) AND (Shooting)
Google News BIs:	Riccardo McCray AND Shooting

Source: New York City Police Department (2012), Everytown for Gun Safety (2014), and Crime Prevention Research Center (2014)

Case 35: Gifford Rally Shooting

Description: Loughner killed six people and wound 13 others at a rally for Gabrielle Gifford's.

Date:	January 8, 2011
Location:	Tucson, AZ
Regional location:	West
Type of location:	Public location
ASO(s):	Jared Loughner
Age:	22
Mortality rate:	6
Injury rate:	13
Casualty rate:	19
ProQuest Central BIs:	(Loughner) AND (Gifford Shooting)
Google News BIs:	Loughner AND Gifford Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 36: IHOP Shooting

Description: Sencion killed four people and wounded seven others at an Ihop.

Date:	September 6, 2011
Location:	IHOP, Carson City, NV
Regional location:	West
Type of location:	Business
ASO(s):	Edurado Sencion
Age:	32
Mortality rate:	4
Injury rate:	7
Casualty rate:	11
ProQuest Central BIs:	(Sencion) AND (Ihop Shooting)
Google News BIs:	Sencion AND Ihop Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 37: Seal Beach Shooting

Description: Dekraai killed his wife and seven others at the Meritage Saloon.

Date:	October 14, 2011
Location:	Meritage Salon
Regional location:	West
Type of location:	Business
ASO(s):	Scott Dekraai
Age:	42
Mortality rate:	8
Injury rate:	1
Casualty rate:	9
ProQuest Central BIs:	(Dekraai) AND (Seal Beach Shooting)
Google News BIs:	Dekraai AND Seal Beach Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 38: Su Jung Health Sauna

Description: Paek killed four relatives in the Su Jung Health Sauna.

Date:	February 22, 2012
Location:	Su Jung Health Sauna, Norcross, GA
Regional location:	South
Type of location:	Business
ASO(s):	Jeong Paek
Age:	59
Mortality rate:	4
Injury rate:	0
Casualty rate:	4
ProQuest Central BIs:	(Paek) PEOPLE AND (Su Jung Health Sauna Shooting)
Google News BIs:	Atlanta AND Su Jung Health Sauna Shooting

Source: Everytown for Gun Safety (2014)

Case 39: Oikos University

Description: Goh killed seven people and wounded three others at Oikos University.

Date:	April 23, 2012
Location:	Oikos University, Oakland, CA
Regional location:	West
Type of location:	School
ASO(s):	One Goh
Age:	43
Mortality rate:	7
Injury rate:	3
Casualty rate:	10
ProQuest Central BIs:	(Goh) AND (Oikos University Shooting)
Google News BIs:	Goh AND Oikos University Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 40: Seattle Café Shooting

Description: Stawicki killed four people and wounded one other in and near the Seattle Café.

Date:	May 30, 2012
Location:	Seattle Café, Seattle, WA
Regional location:	West
Type of location:	Business
ASO(s):	Ian Stawicki
Age:	40
Mortality rate:	4
Injury rate:	1
Casualty rate:	5
ProQuest Central BIs:	(Stawicki) AND (Seattle Cafe Shooting)
Google News BIs:	Stawicki AND Seattle Cafe Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 41: Aurora Theater Shooting

Description: Holmes killed 12 people and wounded 58 others in the Cinemark Movie Theater.

Date:	July 20, 2012
Location:	Cinemark Movie Theater, Aurora, CO
Regional location:	West
Type of location:	Business
ASO(s):	James Homles
Age:	25
Mortality rate:	12
Injury rate:	58
Casualty rate:	70
ProQuest Central BIs:	(Holmes) AND (Aurora Theater Shooting)
Google News BIs:	Holmes AND Aurora Theater Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 42: Sikh Temple

Description: Page, a known white supremacist, killed six people and wounded three others in a Sikh Temple.

Date:	August 5, 2012
Location:	Sikh Temple, Oak Creek, WI
Regional location:	Midwest
Type of location:	Place of worship
ASO(s):	Wade Page
Age:	40
Mortality rate:	7
Injury rate:	3
Casualty rate:	10
ProQuest Central BIs:	(Page) AND (Sikh temple Shooting)
Google News BIs:	Wade Page AND Sikh Temple Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 43: Accent Signage Systems

Description: Engeldinger killed six people and wounded two others after learning that he was being fired.

Date:	September 27, 2012
Location:	Accent Signage Systems, Minneapolis, MN
Regional location:	Midwest
Type of location:	Business
ASO(s):	Andrew Engeldinger
Age:	36
Mortality rate:	6
Injury rate:	2
Casualty rate:	8
ProQuest Central BIs:	(Engeldinger) AND (Accent Signage Systems Shooting) NOT navy
Google News BIs:	Engeldinger AND Accent Signage Systems Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 44: Sandy Hook Shooting

Description: Lanza killed his mother before killing six adults and 20 children in the Sandy Hook Elementary school.

Date:	December 14, 2012
Location:	Sandy Hook Elementary, Newtown, CT
Regional location:	Northeastern
Type of location:	School
ASO(s):	Adam Lanza
Age:	20
Mortality rate:	27
Injury rate:	2
Casualty rate:	29
ProQuest Central BIs:	(Lanza) AND (Sandy Hook Elementary Shooting)
Google News BIs:	Lanza AND Sandy Hook Elementary Shooting

Source: New York City Police Department (2012) and Everytown for Gun Safety (2014)

Case 45: John's Barber Shop and Gaffey's Clean Car Center Shooting

Description: Myers killed four people and wounded two others at a car wash and a barbershop.

Date:	March 13, 2013
Location:	John's Barber Shop and Gaffey's Clean Car Center, Herkimer County, NY
Regional location:	Northeastern
Type of location:	Business
ASO(s):	Kurt Myers
Age:	64
Mortality rate:	4
Injury rate:	2
Casualty rate:	6
ProQuest Central BIs:	(Myers) AND (Shooting)
Google News BIs:	Kurt Myers AND Barber Shop shooting

Source: Everytown for Gun Safety (2014)

Case 46: Santa Monica College Shooting

Description: Zawahri killed his father and brother and began shooting people near Santa Monica College, killing three others and wounding three.

Date:	June 7, 2013
Location:	Santa Monica College, Santa Monica, CA
Regional location:	West
Type of location:	School
ASO(s):	John Zawahri
Age:	23
Mortality rate:	5
Injury rate:	3
Casualty rate:	8
ProQuest Central BIs:	(Zawahri) AND (Santa Monica College Shooting)
Google News BIs:	Zawahri AND Santa Monica College Shooting

Source: Everytown for Gun Safety (2014)

Case 47: Hialeah Apartment Shooting

Description: Vargas set his apartment ablaze and began shooting people in the area. Vargas killed six people.

Date:	July 26, 2013
Location:	Hialeah Apartments, Hialeah, FL
Regional location:	South
Type of location:	Residence
ASO(s):	Pedro Vargas
Age:	42
Mortality rate:	6
Injury rate:	0
Casualty rate:	6
ProQuest Central BIs:	(Vargas) AND (Hialeah apartment shooting)
Google News BIs:	Vargas AND Hialeah apartment shooting

Source: Everytown for Gun Safety (2014)

Case 48: Navy Yard Shooting

Description: Alexis killed 12 people and wounded three in the Washington Navy Yard.

Date:	September 16, 2013
Location:	Washington Navy Yard, Washington D.C.
Regional location:	South
Type of location:	Business (GOV)
ASO(s):	Aaron Alexis
Age:	34
Mortality rate:	12
Injury rate:	3
Casualty rate:	15
ProQuest Central BIs:	(Alexis) AND (Washington Navy Yards Shooting)
Google News BIs:	Alexis AND Washington Navy Yards Shooting

Source: Everytown for Gun Safety (2014)

Case 49: Alturas Tribal Shooting

Description: Lash killed four people and wound two, including 3 family members.

Date:	February 20, 2014
Location:	Alturas, CA
Regional location:	West
Type of location:	Business (GOV)
ASO(s):	Cherie Lash
Age:	44
Mortality rate:	4
Injury rate:	2
Casualty rate:	6
ProQuest Central BIs:	(Lash) AND (Alturas family Shooting)
Google News BIs:	Lash AND Alturas family Shooting

Source: Everytown for Gun Safety (2014)

Case 50: Marysville-Pilchuck High School Shooting

Description: Fryberg killed four friends and wounded one other at the Marysville-Pilchuck High School.

Date:	October 24, 2014
Location:	Marysville-Pilchuck High School, Marysville, WA
Regional location:	West
Type of location:	School
ASO(s):	Jaylen Fryberg
Age:	15
Mortality rate:	4
Injury rate:	1
Casualty rate:	5
ProQuest Central BIs:	(Fryberg) AND (Marysville-Pilchuck High School Shooting)
Google News BIs:	Fryberg AND Marysville-Pilchuck High School Shooting

Source: Everytown for Gun Safety (2014)

Case 51: Charleston Church Shooting

Description: Roof killed nine people in the Emanuel African Methodist Episcopal Church.

Date:	June 17, 2015
Location:	Emanuel African Methodist Episcopal Church, Charleston, SC
Regional location:	South
Type of location:	Place of worship
ASO(s):	Dylann Roof
Age:	21
Mortality rate:	9
Injury rate:	0
Casualty rate:	9
ProQuest Central BIs:	(Dylann Storm Roof) AND (Shooting)
Google News BIs:	Dylann Storm Roof AND Shooting

Source: Horowitz, Corasaniti, and Southall (2015)

Case 52: Chattanooga Shooting

Description: Muhammad fired on two military facilities killing four people and wounding two.

Date:	July 16, 2015
Location:	Recruiting Center, Chattanooga, TN
Regional location:	South
Type of location:	Business (GOV)
ASO(s):	Abdulazeez Muhammad Youssef
Age:	25
Mortality rate:	4
Injury rate:	2
Casualty rate:	6
ProQuest Central BIs:	(Muhammad) AND (Recruiting Shooting)
Google News BIs:	Abdulazeez Muhammad AND Recruiting Shooting

Source: Chattanooga shooting: Five dead in attacks at Tennessee military facilities (2015)

Case 53: Umpqua Community College

Description: Mercer killed nine people and wound seven at the Umpqua Community College.

Date:	October 1, 2015
Location:	Umpqua Community College, Roseburg, OR
Regional location:	West
Type of location:	School
ASO(s):	Chris Harper Mercer
Age:	26
Mortality rate:	9
Injury rate:	7
Casualty rate:	16
ProQuest Central BIs:	(Mercer) AND (Umpqua Community College Shooting)
Google News BIs:	Mercer AND Umpqua Community College Shooting

Source: Gunman among 10 dead at Umpqua Community College (2015)

Case 54: San Bernardino Shooting

Description: Farook and Malik murdered 14 people and wounded 24 others at the Inland Regional Center.

Date:	December 2, 2015
Location:	Inland Regional Center, San Bernardino, CA
Regional location:	West
Type of location:	Business
ASO(s):	Syed Rizwan Farook & Tashfeen Malik
Age:	27.5 (Average age)
Mortality rate:	14
Injury rate:	24
Casualty rate:	38
ProQuest Central BIs:	(Syed Rizwan Farook) AND (San Bernardino Shooting)
Google News BIs:	Syed Rizwan Farook AND San Bernardino Shooting

Source: Berman, Izadi, & Lowery (2015)

Case 55: Pulse Night Club Shooting

Description: Marteen killed 49 people and wounded 53 in the Pulse Night Club.

Date:	June 12, 2016
Location:	Pulse Night Club, Orlando, FL
Regional location:	South
Type of location:	Business
ASO(s):	Omar Marteen
Age:	29
Mortality rate:	49
Injury rate:	53
Casualty rate:	102
ProQuest Central BIs:	N/A
Google News BIs:	N/A

Source: Goldman (2016) and Stapleton and Ellis (2016)

Appendix B: Media Reporting Data

Table B1

Media Reporting Data

Location of incident	Date of incident	Search range	ProQuest Central	Google News	Total number of reports	Number of days between ASEs	Number of media reports per day
Columbine, High School	04/20/99	04/20/99-07/28/99	30,073	-	30,073	100	300.73
Atlanta Day Trading	07/29/99	07/29/99 - 09/14/99	447	1	448	48	9.33
Wedgwood Baptist Church	09/15/99	09/15/99 - 11/01/99	218	1	219	48	4.56
Xerox	11/02/99	11/02/99 - 12/29/99	14	1	15	58	0.26
Radisson Hotel	12/30/99	12/30/99 - 12/25/00	71	1	72	362	0.20
Edgewater Technology	12/26/00	12/26/00 - 02/04/01	274	1	275	41	6.71
Navistar	02/05/01	02/05/01 - 07/07/03	108	1	109	883	0.12
Lockheed Martin	07/08/03	07/08/03 - 08/26/03	99	1	100	50	2.00
Windy City Core Supply	08/27/03	08/27/03 - 07/01/04	71	1	72	310	0.23
ConAgra Food Inc.	07/02/04	07/02/04 - 11/20/04	27	2	29	142	0.20

Table continues next page

Location of incident	Date of incident	Search range	ProQuest Central	Google News	Total number of reports	Number of days between ASEs	Number of media reports per day
Woods	11/21/04	11/21/04 - 12/07/04	230	8	238	17	14.00
Damagepian Show	12/08/04	12/08/04 - 03/11/05	116	15	131	94	1.39
Living Church of God	03/12/05	03/12/05 - 03/20/05	136	5	141	9	15.67
Red Lake Senior High School	03/21/05	03/21/05 - 01/29/06	57	4	61	315	0.19
Goleta Postal Processing Facility	01/30/06	01/30/06 - 03/24/06	6	1	7	54	0.13
Capitol Hill	03/25/06	03/25/06 - 02/11/07	46	4	50	324	0.15
Trolley Square	02/12/07	02/12/07 - 04/15/07	226	51	277	63	4.40
Virginia Tech	04/16/07	04/16/07 - 12/04/07	3,736	402	4,138	233	17.76
Westroads Mall	12/05/07	12/05/07 - 12/08/07	185	36	221	4	55.25
Youth with a Mission Training Center, New Life Church	12/09/07	12/09/07 - 02/06/08	150	30	180	60	3.00
Kirkwood City Council	02/07/08	02/07/08 - 02/13/08	119	5	124	7	17.71
Northern Illinois University	02/14/08	02/14/08 - 03/18/08	389	41	430	34	12.65

Table continues next page

Location of incident	Date of incident	Search range	ProQuest Central	Google News	Total number of reports	Number of days between ASEs	Number of media reports per day
Black Road Auto Wrecking Yard	03/19/08	03/19/08 - 06/24/08	1	-	1	98	0.01
Restaurant	04/03/10	04/03/10 - 06/05/10	10	3	13	64	0.20
Atlantis Plastics	06/25/08	06/25/08 - 03/09/09	17	6	23	258	0.09
City of Kinston and Geneva	03/10/09	03/10/09 - 03/28/09	47	1	48	19	2.53
Pinelake Health and Rehabilitation Center	03/29/09	03/29/09 - 04/02/09	8	10	18	5	3.60
American Civic Association Immigration Center	04/03/09	04/03/09 - 10/31/09	62	28	90	212	0.42
Outside TV Store	11/01/09	11/01/09 - 11/04/09	13	4	17	4	4.25
Fort Hood	11/05/09	11/05/09 - 11/28/09	1,824	173	1,997	24	83.21
Forza Coffee Shop	11/29/09	11/29/09 - 04/02/10	56	14	70	125	0.56
Yoyito-Café Restaurant	06/06/10	06/06/10 - 08/02/10	2	6	8	58	0.14
Hartford Beer Distributor	08/03/10	08/03/10 - 08/13/10	139	22	161	11	14.64
Shooting outside of bar	08/14/10	08/14/10 - 01/07/11	55	1	56	147	0.38

Table continues next page

Location of incident	Date of incident	Search range	ProQuest Central	Google News	Total number of reports	Number of days between ASEs	Number of media reports per day
Tucson	01/08/11	01/08/11 - 09/05/11	126	733	859	241	3.56
IHOP	09/06/11	09/06/11 - 10/13/11	77	9	86	38	2.26
Salon, Meriage	10/14/11	10/14/11 - 02/21/12	179	46	225	131	1.72
Su Jung Health Sauna	02/22/12	02/22/12 - 04/22/12	4	10	14	61	0.23
Oikos University	04/23/12	04/23/12 - 05/29/12	31	11	42	37	1.14
Seattle Café	05/30/12	05/30/12 - 07/19/12	33	30	63	51	1.24
Aurora Theater	07/20/12	07/20/12 - 08/04/12	139	556	695	16	43.44
Sikh Temple	08/05/12	08/05/12 - 09/26/12	628	256	884	53	16.68
Accent Signage Systems	09/27/12	09/27/12 - 12/13/12	65	20	85	78	1.09
Sandy Hook Elementary	12/14/12	12/14/12 - 03/12/13	3,004	581	3,585	89	40.28
John's Barber Shop and Gaffey's Clean Car Center	03/13/13	03/13/13 - 06/06/13	55	13	68	86	0.79
Santa Monica College	06/07/13	06/07/13 - 07/25/13	95	65	160	49	3.27
Hialeah Apartment	07/26/13	07/26/13 - 09/15/13	48	25	73	52	1.40

Table continues next page

Location of incident	Date of incident	Search range	ProQuest Central	Google News	Total number of reports	Number of days between ASEs	Number of media reports per day
Washington Navy Yard	09/16/13	09/16/13 - 02/19/14	1,317	333	1,650	157	10.51
Alturas Tribal	02/20/14	02/20/14 - 10/23/14	8	24	32	246	0.13
Marysville-Pilchuck High School	10/24/14	10/24/14 - 06/16/15	231	116	347	236	1.47
Church	06/17/15	06/17/15 - 07/15/15	640	394	1,034	29	35.66
Recruiting Center	07/16/15	07/16/15 - 09/30/15	246	306	552	77	7.17
Umpqua Community College	10/01/15	10/01/15 - 12/1/15	720	361	1,081	62	17.44
Inland Regional Center	12/02/15	12/2/15 - 06/11/16	2,398	564	2,962	193	15.35
Pulse Night Club	06/12/16	N/A	-	-	-		