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Age as a Predictor of Factors Involved in Targeted School Violence

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Walden University
2017

Abstract

Age as a Predictor of Factors Involved in Targeted School Violence

by

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MS, Walden University, 2013

BA, University of South Florida, 2000

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Forensic Psychology

Walden University

February 2017

Abstract

Targeted school violence (TSV) in the United States is increasing, causing a loss of innocent lives and challenges for teachers and students in building rapport. In addition, TSV increases levels of anxiety and makes it difficult for parents and community members to believe students are safe while at school. Several studies have highlighted the fact that age may be a factor in school shootings, calling for future research to determine if age is indeed influential. The problem is to date age has not been established as a predictive factor, even though the extant research is beginning to identify possible variances. Guided by general strain theory and ceremonial violence, this study determined statistical significance between age and select variables in the personal, event, and ecological categories. This information could be illuminating to educators, mental health professionals, and law enforcement for threat assessment purposes. The information was gathered on all TSV members within the United States from 1966 to 2015 through archival data, and the data were analyzed using logistic regression, Pearson's correlation, and Spearman's correlation. Results indicated that, as age increases, the offenders are more likely to have a higher social status, have a mental health and criminal history, carry out their act in the afternoon, and choose a knife as a weapon. In addition, older offenders are less likely to be students and less likely to have been bullied. Implications for social change include modifications to current threat assessment protocol regarding weapon choice and previous mental health or criminal history, which could be utilized to change public policy for mandatory reporting of students identified as at risk. Also, younger offenders are being bullied more often than older offenders and this could add more awareness to antibullying program procedure and earlier mental health intervention.

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Dedication

This dissertation is dedicated to two groups of people. First, I dedicate this to all of the girls who are unable to acquire an education, due to discriminatory gender norms, location, or developmental disability. No one should be prevented from expanding her knowledge and obtaining a degree.

In addition, I dedicate this project to all of the people who have been affected by targeted school violence. These are tragedies that permeate through families and communities, destroying lives in the process. It is my hope that this study will help, even in some small way, to stop these acts from occurring.

Acknowledgments

First I would like to thank my committee members, Dr. Kristen Beyer and Dr. James Herndon. I would like to thank Dr. Beyer for her knowledge, kindness, and constant cheerleading during this entire process. She made this journey truly enjoyable and I am forever thankful. I would also like to thank Dr. Herndon for his prompt feedback and for his constructive criticism that made me a better writer. Furthermore, I want to thank the best statistician I know, Dr. Douglas Lunsford, because this process would have been a great deal more trying without his assistance. Additionally, I offer a special thank you to Dr. Colleen Allen for teaching me that sometimes during this process you just need to cry.

Next, I want to thank my family and friends for their understanding and encouragement throughout this journey, as their constant support and humor kept me going. Finally, I would like to thank my caring, understanding, and most of all patient wife, Adrienne. She stood by me through frustration, tears, excitement, and celebration with unwavering support and love, and for that, I am eternally grateful.

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Chapter 1: Introduction to the Study

Introduction

The United States is currently experiencing a disconcerting shift in its educational system as violence within schools continues to rise. One particular type of violence, targeted school violence (TSV), is a major cause of this distress, as the number of students and teachers being murdered in schools is becoming a more common occurrence, and thus a public health concern (Haan & Mays, 2013; Lee, 2013). According to Schildkraut and Cox Hernandez (2014), these acts have spurred considerable debate regarding gun laws, school safety, and mental illness protocol, but more research is needed to understand characteristics of these offenders in order to prevent future shootings from occurring. One manner in which to accomplish this is to identify if there is a relationship between age and the personal, event, and ecological variables associated with TSV.

This chapter will provide information regarding the history of school shootings, identify both a social and research problem associated with acts of TSV, specify the purpose and significance of this study, and identify three research questions and subsequent hypotheses associated with the questions. In addition, information on general strain theory (GST) and ceremonial violence theory will be presented to aid in the understanding of TSV. Furthermore, assumptions of this study in addition to limitation will be identified and explained.

Background

Unfortunately TSV is not a new phenomenon in the United States, as the first recorded act of school violence occurred on July 26, 1764, when four Delaware American Indians entered into a one-room schoolhouse in the territory now known as Pennsylvania and killed the teacher,

Enoch Brown, and nine of the students (Lankford, 2015). Since then, the phenomenon has continued. Two shootings, one stabbing, and one bombing, all resulting in deaths, occurred from the first incident in 1764 to 1930; between 1930 and 1966, 11 incidents transpired, resulting in 17 deaths and four injuries (K12academics, 2016). The incident with the most casualties in the United States occurred in 1927 when Andrew Kehoe killed 45 individuals, most of whom were children attending the targeted school, and injured 58 others before taking his own life (Lee, 2013; Meloy & O'Toole, 2011). The motivations for these acts seemed to vary, from revenge or retaliation to unrequited love, and they continued to occur without much publicity until the notorious Charles Whitman attack in 1966 at the University of Texas (Flores de Apodaca, Brighton, Perkins, Jackson, & Steege, 2012). Subsequent shootings transpired from that point forward, at times making locations such as Jonesboro, Arkansas, and West Paducah, Kentucky, household names; however, it was not until the watershed act that shocked the nation at Columbine high school on April 20, 1999, that targeted school violence became an exigent concern (Ferguson, Coulson, & Barnett, 2011; Roque, 2012; Thompson, 2014). Flores de Apodaca et al. (2012) stated that while the number of these incidents is still considered to be low compared to the number of students in attendance every day, multiple victim homicides, as in TSV incidents, have increased significantly between 1992 and 1999, are still occurring today, and have become a focus of research.

Initially, the focus of research began by attempting to profile individuals who had committed a TSV act by identifying specific characteristics. The first profiling attempt referred to these offenders as classroom avengers (Agnich, 2015). However, the United States Secret Service conducted a study headed by former Federal Bureau of Investigation (FBI) agent

O'Toole and quickly asserted no such profile is possible, instead proffering that further investigation into characteristics and level of threat would be more beneficial for early identification. Agnich (2015) indicated that narcissism might be a key characteristic of offenders, which may result in intense feelings of rejection and social isolation. Furthermore, Lee (2013) analyzed all shootings from the original act in 1764 through 2013, identifying aspects such as age, gender, number of attackers, and potential causes. In addition, Meloy and O'Toole (2011) studied the eight warning behaviors often present prior to a TSV attack, highlighting the importance of written or verbal communication of a potential threat often leaked before the attack, commonly referred to as leakage, for threat assessment purposes. Moreover, Oksanen, Sailas, and Kaltiala-Heino (2012) espoused the importance of leakage when they performed a study of leakage that was either online or offline, and determined the online forms of leakage involved a significantly higher level of threat. From that point forward, there has been ample support for utilization of threat assessment.

Threat assessments have been widely used across the U. S. and in additional countries to protect key figureheads. According to Cornell (2015), the purpose of TSV threat assessment is to evaluate the student's behavior, including the dynamic risk factors as well as the context, prior to the escalation of violence in order to prevent the attack. The focus on threat assessment resulted after researchers identified that leakage was occurring in most of the attacks. According to Cornell and Allen (2011), leakage postulated optimism, as analysis of the leaked information has the potential to aid in prevention of future attacks; thus, threat assessment began to gain support as the most promising intervention measure. Cornell and Allen reported that two months after the attack at Columbine, the commencement of the Virginia Student Threat Assessment

Guidelines (VSTAG), an evidence-based practice commonly referred to as the Virginia Model, was initiated through the FBI's National Center for the Analysis of Violent Crime. Researchers investigated 18 attacks that either had been completed or thwarted (Cornell & Allen, 2011). According to Cornell, the Virginia Model involves every secondary school having its own threat assessment team, which consists of an administrator, a mental health professional, and a school resource officer who, upon awareness of a threat, perform a threat assessment. However, the Virginia Model was developed after identification of completed or foiled attacks at the secondary level, and it is posited this assessment may not be the most appropriate evidence-based approach for college level shooters if there is a relationship between age and the personal, event, and ecological variables. The National Behavioral Intervention Team Association (2016) developed the Structured Interview for Violence Risk Assessment, which is a 35 item questionnaire used solely at institutions of higher education (IHE) for threat assessment purposes. Thus, different threat assessments may be necessary for different education levels, but to date no research has been performed examining the influence of age. Currently, there is no evidence-based practice to support the use of two instruments, or to support that the same instrument may be used regardless of age.

Problem Statement

The TSV problem is multifaceted and tangential. Recent research supports the fact that TSV impacts students, educators, and community members by increasing anxiety and interrupting rapport building between students and teachers, identifying a clear social problem (Eraslan-Capan, 2014). In addition to a social problem, there is also a current, significant research problem. Agnich (2015); Meloy, Hoffman, Roshdi, and Guldimann (2014); and

Lankford (2015) each highlighted the fact that age may be a factor in school shootings, calling for future research to determine if age is indeed influential. The problem is to date age has not been established as a predictive factor, even though the extant research is beginning to identify possible variances.

Purpose of the Study

At the time of this study, no research had been performed relating age and personal, event, and ecological variables of TSV offenders. Therefore, there was an identified gap in the current literature pertaining to age and these categories. This research added to the existing literature to determine if age is indeed a factor in TSV offenses. The purpose for this research was to determine if a relationship exists with the rationale being if relationships do exist and the assessors are using the same threat assessment guidelines for all ages, then potential attacks may be missed because the threat assessment was not tailored to the specific population.

Research Questions and Hypotheses

Research Question 1: How does age relate to the probability of change in the personal variables of discipline, academic achievement, social status, student status, precipitating event, criminal history, mental health history, and suicide for juvenile and adult TSV offenders?

$H_0 1$: Age does not relate to the probability of change in the personal variables of discipline, academic achievement, social status, student status, precipitating event, criminal history, mental health history, and suicide for juvenile and adult TSV offenders.

$H_a 1$: Age relates to the probability of change in the personal variables of discipline, academic achievement, social status, student status, precipitating event, criminal history, mental health history, and suicide for juvenile and adult TSV offenders.

Research Question 2: How does age relate to the probability of change in the event variables of number of dead, number of wounded, time of day, time to completion, weapons, perpetrated alone or with a partner, and leakage for juvenile and adult TSV offenders?

$H_0$2: Age does not relate to the probability of change in the event variables of number of dead, number of wounded, time of day, time to completion, weapons, perpetrated alone or with a partner, and leakage for juvenile and adult TSV offenders.

H_a2: Age relates to the probability of change in the event variables of number of dead, number of wounded, time of day, time to completion, weapons, perpetrated alone or with a partner, and leakage for juvenile and adult TSV offenders.

Research Question 3: How does age relate to the probability of change in the ecological variables of location and region for juvenile and adult TSV offenders?

$H_0$3: Age does not relate to the probability of change in the ecological variables of location and region for juvenile and adult TSV offenders.

H_a3: Age relates to the probability of change in the ecological variables of location and region for juvenile and adult TSV offenders.

Theoretical Foundation

There are two theoretical frameworks that provide a lens through which TSV can be viewed, general strain theory (GST) and the ceremonial violence theory. Strain theory was first proposed by Merton (1938) and later developed into GST by Agnew in 1992. Mazerolle and Piquero (1997) analyzed GST and identified three categories of strain: when an individual fails to meet the positive goals they aspire to, when an individual has lost something they value, and when an individual has been subjected to an aversive stimulus such as violence or negative

experiences in school. Therefore, GST theory encompasses the proposed personal variables of this study including academic achievement, social status, and if there was a precipitating event, such as bullying or loss of a girlfriend, prior to the act of TSV. Furthermore, Mazerolle and Piquero also stated that after individuals experience repeated strain, they can develop negative affective states, often leading to anxiety and depression. Thus, the individual may become suicidal or act out in a retaliatory manner. This portion of GST supports the remaining personal variables of discipline, criminal or mental health history, and if the TSV offender was suicidal.

The ceremonial violence theory, first proposed by Fast (2008), encompasses the individual performing a ritual as a means of committing suicide (Warnick, Johnson, & Rocha, 2010). Warnick et al. (2010) stated that the individuals find themselves in a low social status, develop depression, and may become suicidal. Instead of committing suicide in a private manner, they decide they will make a public statement out of the act due to their narcissistic tendencies. Thus, they start to plan out the attack, often making lists of victims, writing in diaries, acquiring weapons, and quite often leaking the event (Warnick et al., 2010). Therefore, the ceremonial violence theory can lend a viewpoint toward understanding the event variables of weapons used, time it took to take the act to fruition, number of dead and wounded, and leakage. Each of these theories will be further analyzed and related to TSV in Chapter 2.

Nature of the Study

This study utilized a quantitative approach to analyze numerical data collected from archival data for TSV offenders; the data were analyzed using logistic regression, Pearson's correlation, and Spearman's correlation. The independent variable (IV) for the study was age of the offender; the dependent variables (DV) were categorized into personal, event, and ecological

classifications with 10, nine, and seven variables respectively. Personal variables included: discipline; academic achievement; social status; if the offender was a student; precipitating events, if the precipitating event was acute or long term, and if the prior circumstance involved bullying; criminal history; mental health history; and suicide. In addition, event variables included: number of dead, number of wounded, time of day incident occurred, time to carry out the act, weapons used, leakage, and if the offender carried out the act alone or with a partner. Finally, the ecological variables were region and type of location. Location type was identified as urban, rural, or suburban. Measurement levels for the DV were primarily categorical with several ratio measurement levels, and the dummy variables were used for the majority of the variable codes.

The target population for this research was all TSV offenders in the United States who have committed an attack from 1966 to 2015, thus utilizing a recent epoch which streamlined the analysis, allowing for current, meaningful recommendations for threat assessment purposes. According to Flores de Apodaca et al. (2012), the two most valid, comprehensive lists of TSV attacks are *Fatal School Shootings in the United States* and the *National School Safety Center*; all subjects were collected from these two federally funded databases which are compiled annually. From that point forward, the data were collected through archival data of local, state, and national news articles. The target population was not be delimited by race, gender, age, nor region, but instead included the total population of TSV offenders during that time period.

Logistic regression is a predictive analysis frequently used when DVs are dummy coded categorical variables and the IV is ratio, as is the case in the proposed study, and therefore is appropriate to answer the aspirations of this study. This analysis will be advantageous in the

proposed study on TSV, as many of the events are discrete, meaning they either occurred or did not. Logistic regression is the most appropriate data analysis method for the proposed data collection, one that has been applied to similar TSV studies, which will be further explored in Chapter 3.

Definitions

For the purposes of this study, age was divided into juvenile and adults, with juvenile status ending at the age of 18. For example, if an 18-year-old senior level high school student was in attendance at their school and committed an act of TSV, then they were considered a juvenile; individuals 19 and older were considered adults. Furthermore, "Targeted violence is defined as violent incidents where both the perpetrator and target(s) are identified or identifiable prior to the incident" (Reddy et al., 2001, p. 4). These attacks can occur in the workplace, in public forums such as movie theaters, churches, or malls, and in schools. Only acts by a perpetrator entering on to school grounds with the intent of carrying out an act of TSV on a known or knowable person or institution were considered TSV. Each variable will be investigated further in the section on operationalization of variables found in Chapter 3.

Assumptions

There are several assumptions that have been interwoven into this study. First, it has been assumed that identification of trends related to specific characteristics of TSV offenders was possible, and that these trends in similarities or differences were meaningful. Moreover, the second assumption was that these identified trends were meaningful for threat assessment purposes. The third assumption was that different threat assessment instruments may be useful to help identify and thwart potential TSV attacks. Finally, it has been assumed that threat

assessment is the most viable manner in which to prevent school shootings. These assumptions were included in this study because recent research is moving in the direction that age is a factor, that trends do occur within this subculture of TSV offenders, and that threat assessment is the most beneficial way of identifying potential attackers (Agnich, 2015; Cornell & Allen, 2011; Lankford, 2015;).

Scope and Delimitations

This study was limited in scope to events of TSV transpiring between 1966 and 2015 in the United States. The purpose for this was twofold regarding timeframe and location. One delimitation for this study was the timeframe. As previously stated, acts of TSV have been occurring since the 1700s and this study only included acts perpetrated from 1966 forward. However, this was intentional as the scope of this study sought to determine if relationships exist to aid in current threat assessment instruments used to identify potential perpetrators, therefore proffering that information gleaned from recent attacks would be the most productive information for present-day threat assessment procedures. Another delimitation of this study was the exclusion of any act of TSV that occurred outside of the United States. The rationale behind this decision was that the majority of acts of TSV occur within the United States, far surpassing acts in other countries (Lee, 2013). Furthermore, differences have been identified between TSV offenders in the United States versus perpetrators in other countries; thus, for threat assessment instruments used in the United States, only U.S. perpetrators was necessary (Meloy et al., 2014; Neuman, Assaf, Cohen, & Knoll, 2015).

The specific focus for the study arose after a noticeable trend in extant literature was identified, which was, of the sparse amount of quantitative research on TSV, these juveniles and

adults had always been combined, even though research was emerging that was identifying that these two groups may actually differ. Generalizability was limited in this study, as the subjects were only individuals who have attempted or committed an act of TSV, and thus the results can only be generalized to other TSV offenders. Also, the study only included acts within the United States, and therefore may not be as applicable to others in different countries. Finally, the sample of TSV offenders was less than 200, which is a low sample size and thus decreased the ability to generalize to larger populations.

Limitations Addressed

Acts of TSV are relatively rare compared to the number of schools, number of students in the schools, and timeframe in which students attend said schools. This meant a low sample size compared to the total population of students in the school systems. Furthermore, this rarity can be viewed as a limitation from a research perspective, as studying TSV potential offenders prior to their attack or having access to the population postattack is extremely difficult whereas studying an attack through observational methods is highly unlikely if not near impossible. Another limitation of this research was that the names of the offenders were gathered via *Fatal School Shootings in the United States* and the *National School Safety Center,* and it is possible that these two lists, even though cross-referenced, did not include every act of TSV committed in the United States between 1966 and 2015. One final limitation of this study was that all of the information was gathered using archival data by means of local, state, and national newspapers, which may have entailed reporting bias from the newspapers. Specifically, some newspapers reported certain aspects of the school shootings and some excluded this same information, thus lacking continuity of information across subjects. Due to the lack of access to these perpetrators

or potential perpetrators, the most viable option to study this population for the purpose of this research proposal was through archival data. Moreover, given previous researchers have asserted the aforementioned lists of TSV offenders provided the most complete, enumerated sample, the offenders were collected from what has been determined to be the most reliable sources. Finally, if missing data does occur, I will need to cross reference as many sources as possible in order to acquire all necessary information regarding the DVs.

Significance

Current researchers have not indicated whether there is a relationship between age and personal characteristics such as academic achievement, social status, criminal or mental health history, nor have researchers explored the relationship between age and event characteristics such as weapons, time of day the incident occurred, or leakage despite the fact that each of these characteristics has been studied in previous research (Agnich, 2015; Meloy et al., 2014; Lankford, 2015). These could all be key concepts paramount to threat assessment that would delineate more information about using different threat assessments. In previous research, risk assessments have had ample support for identifying individuals who may potentially become violent; however, the current trend in research is to use threat assessment for TSV due to the unique context and dynamic risk factors (Cornell & Allen, 2011; Meloy & O'Toole, 2011; Reddy et al., 2001;).

Information on this relationship could be imperative, not only to educators, mental health professionals, and law enforcement, but to community members and policy makers. Additional information could potentially save students' and teachers' lives. Furthermore, more information on the relationship between age and the three aforementioned categories could provide more

knowledge for threat assessment purposes. According to Cornell and Allen (2011), the State of Virginia has already put into effect legislation that demands every school have a threat assessment team on site, and these threat assessors could be afforded the opportunity to use different threat assessments created for secondary levels or IHE if the hypotheses that age is influential is found true. If this does occur and the State of Virginia becomes successful at identifying perpetrators and stopping them prior to these attacks using appropriate threat assessment measures, then other states may model this behavior, leading to the positive social change of fewer TSV attacks in the United States.

Summary

Researchers have indicated that age may be a factor in acts of TSV, but prior to this research no research had been performed to determine if there is a relationship between age and personal, event, and ecological variables associated with acts of TSV. These attacks have been occurring since the 18th century, are on the rise, and affect students, teachers, community members, and policymakers. The acts can be understood through the lenses of GST and ceremonial violence theory and analyzed by a logistic regression using a secondary data analysis to answer the three research questions. This study included a specific scope, delimitations, and several assumptions and limitations, and was largely built upon research collected and described in the literature review in Chapter 2.

Chapter 2: Literature Review

Introduction

Targeted school violence is a growing concern for individuals across the nation. The problem of TSV is multifaceted, affecting school members at lower education levels and institutions of higher education (IHE), community members, concerned citizens, and policy makers. Schools used to represent a place of solace, a location for students to learn, for educators to teach, and for parents and community members to know that children were safe and engaging in productive behaviors that would benefit society; however, there has been a distinct shift in this trend. While it is true that each of the aforementioned activities still occur in schools daily, another trend has arisen; students and teachers are being murdered in schools (Agnich, 2015). This not only has the axiomatic effect of loss of innocent lives, but it also encompasses additional, long-lasting effects to those directly and indirectly involved with acts of TSV. For example, according to Eraslan-Capan (2014), as a result of targeted violence in schools, 84% of teachers were affected both emotionally and psychologically, whereas 61% were affected physically. Eraslan-Capan also reported a distinct negative shift in ability to create rapport between teachers and students as well as a negative effect to students' academic performance after school violence had occurred. Thus, not only does TSV entail the devastating outcome of loss of innocent lives, it also affects future health, ability for teachers to effectively educate students, and interferes with students' learning. Furthermore, those directly involved in the school system are not the only ones affected. Vuroi, Oksanen, and Rasanen (2013) found that community members reported an increased anxiety level and raised level of emotional distress after mass school violence. Furthermore, Vuori et al. (2013) found that in two communities, six

months after acts of TSV had occurred, social solidarity was diminished. This indicated that due

to the fact that the school shooters were members of the community, a lack of social trust

postattack now existed. Thus, TSV is not only a problem for those directly involved in the

incidents, but has tangential, ongoing effects for community members. In addition to the

prominent social problem, there is also a research problem.

School shootings have been an area of research for the last two decades. Researchers

have focused on areas such as profiling, risk and threat assessment, and specific characteristics of

TSV offenders (McGee & DeBernardo, 1999; Meloy, Hoffman, Roshdi, & Guldimann, 2014;

Reddy et al., 2001). Recently, the shift in focus has been toward identifying specific warning

behaviors for threat assessment purposes in order to identify potential TSV offenders prior to

their attack (Agnich, 2015; Mrad, Hanigan, & Bateman, 2015). Agnich (2015) performed a very

thorough study of TSV, identifying 282 cases of TSV across 38 countries which examined

characteristics such as dates, locations, number of victims, weapons used, and school context

information. Agnich found that age was a factor in attempted mass shootings, determining that

offenders were younger than other perpetrators of completed mass shootings, completed mass

killings, and attempted mass killings. Agnich stated that age may be a factor warranting further

research as younger shooters may be less methodical in their planning, which may result in law

enforcement uncovering the younger shooters' plans earlier, thus saving more lives. Lee (2013)

analyzed all shootings from the original act in 1764 through 2013, attempting to identify patterns

in aspects such as age, gender, number of attackers, and potential causes. Finally, Meloy et al.

(2014) performed a study on warning behaviors used for threat assessment purposes of TSV

offenders. They determined that age and gender might influence the presence of warning

behaviors, calling for future research in this area. However, the problem prior to this study was that to date no research had been performed to determine if there is a relationship between age and the personal, event, and ecological variables proposed in this study, even though each of these variables have been identified and examined in previous research (Dutton, White, & Fogarty, 2013; Flores de Apodaca et al., 2012; Lankford, 2015). Therefore, the purpose for this research was to determine if a relationship exists. The rationale behind this research was if relationships do exist and the assessors are using the same threat assessment guidelines for all ages, then potential attacks may be missed because the threat assessment was not tailored to the specific population.

This chapter will identify specific databases and search engines used for data collection followed by an exhaustive literature review. Next, general strain theory (GST) and ceremonial violence theory will be examined to provide a lens through which TSV can be viewed. Furthermore, the chosen methodology will be explained, identifying the independent variable (IV) and dependent variables (DV) including their associated levels. Finally, a gap will be identified in the literature and support will be provided for inclusion of new literature to add to the existing gap.

Databases and Search Engines

PsycINFO, PsycARTICLES, PsycEXTRA, ERIC, ProQuest Criminal Justice, LegalTrac, Mental Measurements Yearbook, Dissertation and Theses, and SocINDEX databases were searched using the following keywords: *targeted school violence, school shootings, school mass violence* using Boolean *OR*, and *rampage shootings* using Boolean *AND schools*, and *targeted violence* using Boolean *AND schools.* Additionally, Google Scholar was utilized in order to

identify more popular press publications. Furthermore, several government agencies were utilized such as the Federal Bureau of Investigation and the Center for Disease Control and Prevention. Finally, reference lists were searched in order to obtain further, relevant information. The types of literature searched were included in the following domains: psychology, criminal justice, legal, education, and behavioral sciences.

Theoretical Framework

General Strain Theory

The purpose of this study was to determine if there is a relationship between age and personal, event, and ecological variables associated with acts of TSV. Within each variable, several factors (levels) exist, identifying specific characteristics of either the offender or the incident. General strain theory provides a lens through which these variables and corresponding research questions can be viewed.

Merton's (1938) theory of strain was the original strain theory that was later revised by Cohen and Cloward and Ohlin in 1955 and 1959 respectively (Broidy, 2001). From this foundation, Agnew developed GST in 1992 (Broidy, 2001). Agnew's revisions were necessary due to criticism regarding the fact that earlier strain theories focused on lower class adolescent males from urban environments, which according to Broidy (2001) involved a number of uncertain assumptions such as class and crime have an inverse relationship and that strain directly causes crime. Agnew posited that strain occurs when an individual fails to meet the positive goals they aspire to, when an individual has lost something they value, and when an individual has been subjected to an aversive stimulus such as violence or negative experiences in school (Mazerolle & Piquero, 1997). Thus, there was a distinct shift from earlier strain theories

that focused on social structural aspects to Agnew's theory which identified strain as a social psychological variable (Broidy, 2001).

After an individual experiences strain, there are several factors that may ensue. According to Mazerolle and Piquero (1997), post strain an individual can begin to experience negative affective states such as anxiety, depression, frustration, and anger, which may in turn result in them acting out violently against others, seeking retribution or retaliation. For example, if a student has been repeatedly bullied at school, causing him frustration, anger, and eventually depression or anxiety, then the student may decide that instead of enduring future bullying by his peers, he will seek retribution and revenge by bringing a weapon onto school grounds and retaliating against those he perceived caused him harm. This may be the students who mistreated him, the other students who watched, or the faculty who did nothing to stop the maltreatment.

GST has been utilized to understand the causes and responses to strain among fields such as psychology, criminology, and sociology. More specifically, GST has been used to understand responses to strain such as violence because, after all, everyone who experiences strain does not act out in a violent manner. Therefore, other factors that led the individual to violence must be considered. Zavala and Spohn (2013) studied several types of strain that lead to criminal behavior, identifying experienced, anticipated, and vicarious strain; specifying, experienced strain involves the individual's own involvement in strain, anticipated strain encompasses the individual's negative expectations of the future as a result of strain, and vicarious strain includes either being witness to or having knowledge of other's strain. Zavala and Spohn determined that increased experienced and vicarious strain would lead to both perpetrating and victimization of criminal behavior whereas anticipated strain would increase the likelihood of victimization.

Therefore related to TSV, if a student has witnessed another student, especially a student they have close personal ties with, being victimized at school, then as a result that student may be more likely to act out aggressively; the same holds true for experienced strain. Hay and Meldrum (2010) also identified specific types of strain, however, they identified the ramifications of strain with regard to self-harm. Hay and Meldrum focused their research on peer abuse, particularly bullying, as this satisfied four conditions of strain identified by Agnew: there was an unjust perception of the treatment, there was a lack of social control as the treatment was often outside the view of authority figures, it was important as adolescents often give great weight to peer relations, and it presented an opportunity for the individual to view modeled deviant behavior from the bullies themselves.   Hay and Meldrum determined a statistically significant relationship between negative emotions associated with bullying and self-harm and suicidal ideations. Interestingly, these authors also found exposure to authoritative parenting and their own perception of self-control minimized the negative consequences of this type of strain. While authoritative parenting and self-control are beyond the scope of this study, combining Zavala and Spohn and Hay and Meldrum's research and relating it to TSV, we can conclude that when individuals either experience personal or vicarious strain, they are more likely to act out aggressively on others as well as themselves. Therefore, this aligns closely with TSV offenders entering into a school building with the intent of both harming others as well as committing suicide, either by self or officer, where the student either previously stated they had plans to commit suicide or did not think they would survive the attack. However, GST theory does not only apply to adolescents, but also to adults.

Adults in IHE also experience strain, and the negative emotional reactions associated with strain can also lead to violence. Huck, Lee, Bowen, Spraitz, and Bowers (2012) tested three hypotheses with a sample of university students: strain and associated negative emotions interfere with attainment of goals, emotions associated with strain could be positive or negative and these positive or negative emotions may lead to positive or negative coping skills; if the individual uses negative coping skills then they will have a higher likelihood of engaging in criminal behavior, whereas the inverse is true for positive coping skills. Huck et al. determined the negative emotion of anger was negatively related to the lack of positive coping skills and that anger led to negative coping skills. They also offered support for the importance of opportunity and desire to commit criminal activity, stating these are conditioning variables that must be attended to that can lead to an individual either engaging or not engaging in criminal behavior (Huck et al., 2012). Thus, utilizing these findings of GST on TSV, if an adult TSV offender experiences strain and anger as a result, and subsequently uses negative coping methods to alleviate the anger in addition to having the desire and opportunity, then they are more likely to engage in carrying out an act of TSV.

GST has been used to explain many types of violence responses, and it has also been utilized to explain the specific variables in this study. Mazerolle and Piquero (1997) stated that deviant responses to strain could be affected by personal variables such as social status, academic achievement, past criminal behavior, and past mental health history. Furthermore, Mazerolle and Piquero also noted the personal variable of precipitating event used in this study as a possible explanation for violent responses to strain, stating the response may simply be an adverse reaction to an accumulation of strain over time—long-term strain—or to an extremely

high level of strain—acute—acting as a precursor to the event. Moreover, Mazerolle and

Piquero also identified that many individuals who have deviant peers may model their peers'

behavior and respond in a violent manner, and this espouses the event variable of committing an

act of TSV alone or with a partner.

Targeted school violence can be understood through the lens of GST for several reasons.

The first aspect of the theory refers to an individual's failure to achieve desired goals, and this

may mean failure to have a high social status, failure to obtain high academic achievement, or

failure to engage in a romantic relationship with the person they desire. These are of paramount

importance to many students, both in secondary education and at IHE, and have been seen as the

motivation to carry out acts of TSV in many incidents (Bushman et al., 2016). Failure to achieve

these desired goals can induce strain, and based on the aforementioned research can lead to

acting in a violent manner, against self or others, if adequate coping skills are not present. Thus,

a student who feels neglected by the group of students who have achieved a coveted, higher

social status can induce strain, lead to depression or anger, and culminate in the student's desire

to retaliate or seek retribution (Mazerolle & Piquero, 1997). The second characteristic can be

used to explain bullying and lack of romantic relationship, two variables that have been evident

in many TSV acts.

The second feature of GST involves experienced stress related to an event, and Mazerolle

and Piquero (1997) related this theory specifically to incidents often occurring in schools such as

being suspended from school or loss of a girlfriend or boyfriend, and in this current study can be

deemed a precipitating event which is either acute or long-term. The stressful event could also be

bullying, and result in a suspension, loss of a partner, or inability to be accepted by a higher

social status. According to Hay and Muldrum (2010), bullying is a primary precursor to acting

out violently, either against self or others, and has been seen in a myriad of acts of TSV. In fact,

Hay and Muldrum stated that individuals who have been victims of bullying are two times more

likely to engage in self-harm. In a number of acts of TSV the individual has stated that they are

simply trying to stop the pain they are in, and were suicidal but did not have the fortitude to

commit suicide; thus, they decided to carry a weapon onto school grounds, knowing they will

most likely be shot by law enforcement (Thompson, 2014). Thus, using GST it is clear to see the

links between TSV and the personal and event variables included in this current study. The

ceremonial violence theory can also be used to expand on the various personal and event

variables.

Ceremonial Violence Theory

The ceremonial violence theory, first proposed by Fast (2008), encompasses the

individual performing a ritual as a means of committing suicide (Warnick et al., 2010). Warnick

et al. (2010) stated that the individuals find themselves in a low social status, develop depression,

and may become suicidal. Instead of committing suicide in a private manner, they decide they

will make a public statement out of the act due to their narcissistic tendencies. Thus, they start to

plan out the attack, often making lists of victims, writing in diaries, acquiring weapons, and quite

often leaking the event (Roque, 2012; Warnick, et al., 2010). In addition, Warnick et al. also

proposed that often the offender will turn the event into a ceremony, and prepares by choosing

specific clothing, music, and may include others in the act by telling their peers to be in a certain

location of the school at a certain time. Warnick et al. liken this preparation and eventual follow

through of violence to Homer, by stating "the goals of the shooters seem to us to align with the

Homeric ideal of obtaining immortal fame and notoriety (kleos) through acts of seemingly

superhuman violence" (p. 377). Warnick et al. also noted that many TSV offenders have the

expectation that their attack will end in suicide, as those who have survived their attacks have

either explicitly stated this or simply said they had no plans postattack because they did not think

they would survive; their idea was that they would simply go out in a blaze of glory and would

be infamous for their attack. Thus, they were creating a ceremony of their violent act that would

culminate in them being both noticed and remembered. Warnick et al. stated that oftentimes a

ritual is a way to reunite a community; however, in the case of TSV the inverse is true as the

offenders have often stated they feel as if they are marginalized, hated, or ignored members of

their community, and thus use the ceremony of violence as a retaliation against those who

ignored or mistreated them. Based upon this information, the ceremonial violence theory can

lend a viewpoint toward understanding the personal variable of social status and the event

variables of weapons used, time it took to take the act to fruition, number of dead and wounded,

and leakage.

Construct and Variables

Targeted violence is defined as an incident of violence where a known or knowable

assailant chooses a particular target prior to their violent attack; these attacks can occur to in the

workplace, in public forums such as movie theaters, churches, or malls, and in schools. TSV is

not a new phenomenon in the United States, and although the incidents are extremely rare, when

they do occur they have devastating effects to many stakeholders. According to Cornell (2015),

there are approximately 125,000 elementary and secondary schools in the United States, and

between 1996 and 2006 an average of only 21 homicides occurred in the school setting, meaning

that a person at any of these schools can expect to experience a homicide in the school approximately one time per 6000 years. The first incident in the United States dates back to 1764, and the incident with the most casualties in the United States occurred in 1927, when Andrew Kehoe killed 45 individuals, most of whom were children attending the targeted school, and injured 58 others before taking his own life (Lee, 2013; Roque, 2012). However, it was not until the watershed act at Columbine high school that these attacks became widely known, and thus a focus of research. The focus of research began by attempting to identify specific characteristics in order to create a profile of a TSV offender. According to Agnich (2015), early reports indicated that narcissism may be a key characteristic of offenders, which may result in intense feelings of rejection and social isolation; the researchers attempted to list a series of characteristics and termed these offenders classroom avengers, however, O'Toole was then sanctioned by the United States Secret Service (USSS) and quickly asserted no such profile is useful and firmly stated the most effective way to identify and potentially thwart these attacks is through threat assessment. From that point forward, there has been ample support for utilization of threat assessment.

Meloy and O'Toole (2011) studied the eight warning behaviors often present prior to a TSV attack, highlighting the importance of written or verbal communication of a potential threat often leaked before the attack, commonly referred to as leakage. Furthermore, Lindberg, Oksanen, Sailas, and Kaltiala-Heino (2012) espoused the importance of leakage when they performed a study of leakage that was either online or offline, and determined the online forms of leakage involved a significantly higher level of threat. Moreover, Neuman et al. (2015) also studied leakage via text for threat assessment purposes, which led them to determine specific

characteristics such as narcissism, revengeful thinking, and feelings of humiliation present in TSV offenders as opposed to other students of concern. Thus, it is clear to identify the distinct shift in empirical research for threat assessment, and what is noteworthy is that there is a distinct lack of quantitative research regarding specific characteristics of the shooters as well as the incidents themselves.

Acts of TSV have rarely been studied using quantitative methods. According to Ferguson, Couson, and Barnett (2011), "empirical research on school shooters in near nonexistent" (p. 10). Instead research has relied on case studies, typologies which attempt to uncover the offender's motivation or relationship to the victims, media involvement in these incidents, or community reactions post-attack (Agnich, 2015; Lee et al., 2014; Räsänen, Hawdon, Näsi, & Oksanen, 2014; Sequin et al., 2013; Thompson, 2014). For example, Barbieri and Connell (2015) sought to identify differences between the United States and Germany regarding media coverage after a TSV event, determining the U.S. media focused more on the themes of school safety measures, familial disruptions, and individual factors such as aggression and mental illness than Germany's media involvement. Seguin et al. (2013) focused their research solely on the Dawson College shooting, whereas Langman (2012) identified psychopathic, psychotic, and traumatized school shooters. One problem with typologies is that these offenders are an extremely heterogeneous group and often do not fit into one of the typologies. Regarding case studies, while many have proven useful for practitioners with regard to further understanding threat assessment or the role of strain, case study findings yield a vast amount of information about a single subject and due to the heterogeneous nature of these offenders may not be found useful in other cases. Therefore, this quantitative study explored age

as a factor on numerous variables in order to identify if there is a relationship. The independent variable for the study was be the offender's age, and the dependent variables was divided into three categories: personal, event, and ecological. The personal variables are: discipline; academic achievement; social status; if the offender was a student; precipitating events, type of event, and if the precipitating event was acute or long term; criminal history; and mental health history. The event category included: number of dead, number of wounded, time of day, time to fruition, weapons used, if the act was committed alone or with a partner, if leakage was present prior to the attack, and suicide. The ecological category included the variables of setting—urban, rural, or suburban—and if the incident occurred in a Southern, Northeastern, Midwestern, or Western region. While there is a paucity of quantitative data on these offenders, the few that do exist have included many of these variables in the research to determine different aspects of school shooters; if they have not been found as a variable in previous research, they have been identified as a topic for future research.

Variables

The most comprehensive quantitative research on TSV was performed by Agnich (2015) in which she identified four dependent variables and five independent variables, using 282 subjects worldwide who had each attempted or completed a TSV attack; her study sought to determine the differences in specific characteristics of the shooters who were in one of the following four categories: completed mass shooting, attempted mass shooting, completed mass killing, or attempted mass killing. The studied yielded noteworthy results and supported the use of several of the variables in the current study. For example, Agnich stated that there was a sharp increase in all events of TSV during the timeframe of her study, which included all

incidents from 1900 to 2010; in a more recent timeframe over the past four decades, Haan and Mays (2013) reported four incidents in the 1970s, five incidents in the 1980s, 28 incidents in the 1990s, and 25 incidents occurring between 2000 and 2010. Lankford (2015) also supported the idea that the trend of TSV was drastically on the rise, and reported over 60 mass shootings since 1980 and specifically, between 2010 and 2013, found that approximately 40 acts of TSV had occurred. Interestingly, there is a contradiction in reports regarding prevalence of TSV throughout the past several decades. For example, based on a CDC report from 2008, Flores de Apodaca et al. (2012) stated that between 1992 and 1999, 358 violent deaths occurred in schools, which is a drastically higher number of fatalities than other research has determined; they did however specify, identifying rampage versus TSV shootings that of those 358, finding 38 fatal rampage shootings from 1996 to 2007 and 96 schools in which TSV shootings had occurred. This is a considerably higher number of TSV shootings than previously reported. Nonetheless, TSV is a public safety concern that must be addressed as the fact remains that students and teachers are being murdered in schools. In addition, there has been a dramatic and steady increase in TSV incidents from the notorious Charles Whitman Texas bell tower shooting in 1966 that resulted in 16 being killed and more than 40 being wounded (Ferguson et al., 2011; Flores de Apodaca et al., 2012;). This means that, while the problem has existed since schools and guns have coexisted, the rate is on the rise.

Agnich (2015) also found evidence of differences between lower education shootings and IHE in her attempt to determine differences regarding location of incidence. The research indicated that IHE had more urban and rural mass shootings whereas elementary schools experienced more mass killings in rural areas than in urban areas (Agnich, 2015). Flores de

Apodaca et al. (2012) reported universities experienced more random shootings whereas high schools experienced a far great number of targeted shootings. Thus, it is clear to surmise that research is indicating TSV is increasing and there are differences between lower and higher educational institutions. In fact, in Lankford's (2015) dissertation work on TSV juvenile offenders, he specifically stated a recommendation for future research would be "a quantitative study, similar in scope and design, of school shootings occurring in institutions of higher education such as colleges and universities within the United States to examine and compare trends with that of this study" (p. 97). Therefore, a gap that warrants attention does exist, and more information must be elucidated in order to add to the extant literature on TSV and the differences between lower level institutions and IHE. One manner in which to do so is to identify and discern if there is a relationship between age and the personal, event, and ecological characteristics of TSV offenders.

Personal. The personal variables for this study were: discipline; academic achievement; social status; if the offender was a student; precipitating events, type of event, and if the precipitating event was acute or long term; criminal history; and mental health history. Basic demographics were also included in this study, and they included age of shooter, grade, gender, race, and socioeconomic status. As previously mentioned, these variables, in addition to basic demographics, have either been included in previous research or have been recommended as variables for future research. For example, Flores de Apodaca et al. (2012) determined the average age of a TSV offender was 16, that males are overwhelming more likely to carry out an act than females, that a precipitating event did occur prior to the act that influenced carrying out said act, and that social attachment to the school was a factor, indicating social status may also

be a dynamic. In addition, Meloy et al. (2014) performed a study comparing United States shooters to German shooters and determined that 93% of the U.S. shooters had engaged in preparatory planning for the attack, that 78% had previous suicidal attempts or what is termed last resort thinking, meaning they felt hopeless and as if they had no other choice but to end their lives; last resort thinking is deemed a mediating variable for depression. Furthermore, Meloy et al. also found that 89% of the shooters were current students of the school they attacked and that the average age was 16. Research from Haan and Mays (2013) indicated that most of the shooters in their study had psychological problems, were Caucasian, came from relatively affluent suburban backgrounds, had no criminal history, were less likely to carry out an attack if they felt a strong bond with their community or school, and had a precipitating event prior to the attack that was influential in them carrying out the attack; they also found some of the shooters had brief discipline issues. Agnich's (2015) work also espoused several aspects of the current study and in addition found contradictory results regarding age; specifically, the research indicated the average age of a perpetrator of mass killing was 28.03, which was older than both previous study's mean ages offenders as well as her other three categories of attempted mass killings, attempted mass shootings, and completed mass shootings. Agnich called attention to the age factor, stating that this result was noticeably different than earlier reports of age of school shooters. Agnich also found age to be another factor between her groups, reporting that the average age of offenders of attempted mass shootings was 18, following this by stating the reason for this may be the lack of methodological planning in younger perpetrators, as 33.3% of the attempted shootings were thwarted by law enforcement compared to only 14.3% of attempted killings. Furthermore, Agnich's study also supported the importance of further research

regarding mental health status of the offender when she stated that untreated mental illness was not thoroughly covered in the research with regard to TSV and should be an area for future investigation to identify potential motivating factors important to policy makers. Moreover, Agnich also contrasted previous research on several key points, stating that previous research indicated the perpetrators were overwhelmingly white males; however, she found statistically significant results regarding mass killing offenders who did not use a firearm, as they were much less likely to be Caucasian.

Finally, Bushman et al. (2016) also highlighted several of the demographics and personal variables in the proposed study. Their study noted the descriptive differences between school shooters and what the authors termed street shooters, finding the majority of TSV offenders were white males; had little to no history of discipline problems or criminal history; were predominantly from middle class SES status; had mental health challenges in the past, even if it was undiagnosed or untreated; and had obtained an average or above average academic achievement record. Therefore, there is ample support for the inclusion of each demographic area as well as every personal variable in this study. Moreover, there is a discrepancy in information pertaining to several factors that warrants further examination. Each of these studies was performed for a specific reason, none of them being to identify a relationship between age and the personal, event, and ecological variables. They have in fact identified a relationship between age and certain characteristics. Thus, there is a clear gap in the literature and it is proffered this research could add to the existing literature to more fully understand acts of TSV, and more importantly specific characteristics of the offenders and the events.

Event. The event variables for the study are number of dead, number of wounded, time

of day incident occurred, time to carry out the act, weapons used, suicide, leakage, and if the offender carried out the act alone or with a partner. As with the personal variables, each of these variables has been utilized in previous research on TSV. First, the number of dead and number of wounded has been an area of focus, both by the media and throughout research. In fact, given the increase in frequency of events, if there is a low number of victims or only victims wounded, today school shootings will have little coverage via the media; this also includes acts that were thwarted prior to perpetration (Thompson, 2014). As previously stated, number of dead and wounded has often garnered attention in the few quantitative studies on TSV. However, there is a discrepancy in number of dead and number of wounded reported in each study due to the research questions under investigation (Agnich, 2015; Flores de Apodaca et al., 2012; Lankford, 2015; Meloy et al., 2014). Nonetheless, identifying the differences in variables of number of dead and number of wounded between juvenile and adult TSV perpetrators may shed light on their amount of preparation and planning and provide more insight to threat assessors.

There has been a paucity of research on time of day and time to fruition these incidents occur, and this could also prove useful for school personnel and law enforcement charged with the task of protecting their institutions. For example, in seminal research on originator versus follower TSV offenders, Lowry (2009) found no significant differences between time of day the incidents occurred. While Lowry did not report any additional information pertaining to time of day, the variable was of interest in the study and could potentially lead to more information regarding lower educational environments versus IHE. Agnich (2015) used time as a variable in her study, and coded for time to fruition as hostage situation, indicating a longer time to fruition for hostage situations.

Weapons have been extensively studied in extant research on TSV, and have shown a number of interesting results. What yields the most interesting results are the variety of weapons used and the correlation to number of dead or number of wounded. This topic has also warranted recent media coverage regarding the family members of those killed in the Sandy Hook shooting who are attempting to sue the Bushmaster and Remington firearms company, stating there is no need for civilians to carry this much firepower and have the ability to kill multiple individuals in minutes (Feyerick, 2016). Agnich (2015) found a total number of 437 weapons used in her study of 282 incidence of TSV; specifically, there were 306 handguns and long guns, 53 explosives, and approximately 60 knives or swords. Her research indicated there were a much higher number of homicides when explosives were used. Meloy et al. (2014) also studied weapon type in their comparison between United States and German school shootings, determining 78% of the attacks used firearms, 44% of the attacks utilized explosives and smoke grenades, and 22% of the attacks used knives. Finally, Lankford (2015) found 43.18% of the 88 TSV perpetrators in his study carried handguns, 12.50% carried long guns, and only 1.14% carried knives; however, what is interesting about Lankford's findings is that on multiple occasions (9.09%) of the school shootings, the perpetrator carried multiple weapon types, most often a handgun and rifle or shotgun, but in three of the incidents the offender carried a combination of knife, machete, and Molotov cocktail. Lankford also studied obtainment of weapons in his study on juveniles, which indicated that 18 of the 88 juveniles acquired their weapon from home, which is approximately 20% of the incidents. In 2.27 % of the incidents, the offender borrowed the weapon from a friend, and only 1.14% the offender stole the weapon. This contrasts reports by Bushman et al. (2016); however, it should be noted that Bushman et al. did not perform a quantitative study, but

instead completed a meta-analysis which summarized several previous studies over the past two decades. Bushman reported a much higher rate of obtainment from family at 68%, but also noted differences in obtainment of weapons between juveniles and adults by indicating college students typically acquire their weapons from the internet, from gun shows, or other legal means.

Attempting or committing suicide is a very common occurrence in incidents of TSV. Early works by Lowry (2009) reported that 79 of the 99 perpetrators in her research either planned to commit or committed suicide following the incident whereas 20 did not plan to commit suicide. Moreover, Bushman et al. (2016) reported that 61% offenders reported severe depression and 78% either contemplated or attempted suicide prior to their attack; based on previous findings, Bushman et al. stated that 43% of the TSV perpetrators committed suicide during the incident. The authors did not report if they considered suicide by officer in their total, as was considered in other studies. Lankford (2015) divided suicide into three categories: killed by law enforcement, committed suicide, or was assisted by a fellow perpetrator in suicide, reporting that 19.48% of the perpetrators committed suicide either during or shortly thereafter the incident and not a single perpetrator was killed by law enforcement but instead the majority were arrested during the incident. Agnich (2015) reported that 31% of perpetrators of mass shootings committed suicide, finding statistical significance between mass shooters and attempted or completed mass killers. Finally, Meloy et al. (2014) study comparing United States to German school shooters with regard to warning behaviors determined that 78% of U.S. school shooters had a history of suicidal attempts or ideation. These suicide percentages are extremely high for the population of TSV perpetrators, and warrants further examination to determine if trends exist regarding age.

One interesting aspect that has been studied pertains to if the shooter planned or carried out the attack alone or with a partner. Seminal research on TSV performed by Lowry (2009) used this concept as a variable in her study of 99 school shooters comparing originator versus followers and her results indicated that 56.6% of the perpetrators planned or committed the attack alone compared to 43.3% of the offenders who planned or committed the attack with a partner. Bushman et al. (2016) reported that there was a major descriptive difference between school shooters and street shooters, stating that most street shootings occur with a co-offender, while most school shootings are committed alone. Agnich (2015) found that completed mass shooters typically perpetrated their act alone, whereas attempted mass shooters had a much higher statistical significance, committing the act with a partner. Moving in a different direction, Lindberg et al. (2012) studied text of TSV offenders, finding that while none of the offenders in their study did in fact carry out the act with a partner, several of them were active in online communities that supported or even encouraged the offender to carry out the act of TSV. What is intriguing about all of these reports is the number of acts that were either planned or carried out with a partner, due to the well-known information that many of these offenders are considered to be loners or social outcasts. It would be interesting to determine if age is related as simply by the nature of their environments at lower educational levels or IHEs, it could be proffered that the closer knit communities of lower educational environments might have more planned or committed with a partner attacks whereas a more spread out campus life of a college may have more perpetrators who committed the act alone.

Leakage is one of the more commonly studied variables in research on TSV, mainly because of its level of importance in threat assessment and the current upshift in trend on using

threat assessment to identify and stop acts of TSV. Threat assessments have been used widely

across the United States and in additional countries to protect key figureheads. Threat

assessment is a system that provides individuals with an opportunity to report violent threats and

affords threat assessors the opportunity to assess the type and level of threat in order to thwart

the attack (Nekvasil, Cornell, & Huang, 2015). In previous research, risk assessments have had

ample support for identifying individuals who may potentially become violent; however, the

current trend in research is to use threat assessment for TSV (Cornell & Allen, 2011; Meloy &

O'Toole, 2011; Reddy et al., 2001). Van Brunt (2015) clarified the difference by stating

> Threat assessment and risk assessment have developed as somewhat overlapping fields.
>
> Violence risk assessment has an older provenance, and is a method by which the
>
> probability of generally violent behavior is estimated for an individual based upon
>
> membership in a particular at-risk group. Threat assessment is concerned almost wholly
>
> with the risk of targeted violence by a subject of concern, and has a behavioral and
>
> observational policing focus. Risk assessment may address different domains of risk
>
> than threat assessment, and typically relies on more historical and dispositional (status)
>
> variables (p. 2).

Reddy et al. (2001) provided several reasons to support the use of threat assessment as opposed

to other forms of risk assessment such as profiling or guided professional judgment because

targeted violence differs substantially from other forms of aggression. Reddy et al. cautioned

against these forms of risk assessment for TSV because of false positives due to the rarity of

these events, lack of base rates because of the low prevalence of the events, and lack of empirical

research on risk factors for TSV. Therefore, researchers who study TSV events focus on using threat assessment.

One key component of threat assessment is identifying warning behaviors that may indicate an impending attack. According to Meloy et al. (2014), leakage, a warning behavior, is often the first evidence of an approaching targeted attack and it is a valuable piece of information to a threat assessor that can help determine motivation as well as category and level of threat. Meloy et al. also stated that age might influence warning behaviors such as leakage. If leakage commonly occurs in adults, but is less present in juvenile TSV offenders and the assessor minimizes this lack of leakage, then this may be an error as it simply may not be as common in the juvenile population. For example, Seung-Hui Cho, the TSV attacker who killed 32 people and wounded 17 others at Virginia Tech, leaked his information prior to their attacks (Schildkraut & Hernandez, 2014). Cho's writings were so disconcerting to his professor that she turned him in to school authorities who subsequently mandated counseling. Unfortunately, the treating clinician did not determine Cho was a danger to self or others (Schildkraut & Hernandez, 2014). However, if more research were applied to literature identifying the significance of leakage prior to these attacks and that it may be more or less present in juveniles versus adults, then educators, mental health professionals, and law enforcement may attend more to these factors and potentially save innocent lives.

According to Cornell (2015), the purpose of TSV threat assessments is to evaluate the behavior of a student, including the context and dynamic risk factors, prior to the escalation of violence in order to prevent the attack. The focus of threat assessment resulted after researchers identified that leakage was occurring in most of the attacks. According to Cornell and Allen

(2011), leakage postulated optimism as analysis of the leaked information provided prior to the attack may aid in prevention of the future attack; thus, threat assessment began to gain notoriety as the most promising prevention measure. Therefore, current quantitative research on TSV includes leakage in their studies, particularly after Meloy and O'Toole's (2011) published research on the eight warning behaviors, highlighting the number of times leakage has occurred in acts of TSV and calling for future research on the subject. There are several empirical studies that have used leakage as a variable, and many studies that have emphasized its importance. For example, Meloy et al. (2014) found an overwhelming 81% of incidents including leakage where at least one person other than the perpetrator was aware of the thinking, planning, and preparation prior to carrying out the act of TSV. What is interesting about this statistic compared to the other variables is that there seems to be little to no discrepancy in information across studies. Ferguson et al. (2011) also reported that 81% of the perpetrators told someone, usually a friend or peer, about the event prior to committing it. Haan and Mays (2013) offered a plausible explanation for why so many students leak their information, asserting the student's need for attention and attempt to turn their violence into a public event. Bushman et al. (2016) espoused this information by stating that 78% of the students were considered to be marginalized members of the school and community, considered to be "wannabees," "gothic," or "geeks" (p. 19). Whatever the reason may be for the leaked information, the fact remains that the majority of school shooters do tell someone about their plan prior to the attack, offering a tremendous opportunity for intervention before they carry out their violent act, in addition to being able to help a prospective perpetrator who may feel they simply have no other choice. Nonetheless, what has not been studied is the difference in frequency of leakage between juveniles and adults, as

adults may not feel as socially marginalized, thus needing less attention from their peers. The information could be crucial to educational personnel, law enforcement, and mental health practitioners who may be attempting to identify presence of the eight warning behaviors for threat assessment purposes.

       Ecological. Location has been an area of investigation when it comes to TSV offenses. There has been a widespread interest in region and type of location for various purposes such as to identify trends or to understand if different procedures would help thwart these attacks based upon the location. Agnich (2015) coded her research for region as well as location—rural, urban, or suburban—within the United States, and determined the southern regions had a higher number of attempted mass shootings and attempted mass killings, in addition to mass shootings. Moreover, differences were also found between regions. Agnich reported high schools in rural locations are targeted for mass shootings at a rate of 19.8% as opposed to 6.3% or 13.5% for suburban or urban mass shootings whereas colleges and universities are targeted 22.2% in urban locations as opposed to 3.2% or 7.1% in suburban or rural settings. These numbers indicate a strong potential for differences to be discovered between lower education shootings and shootings at IHE, being that nearly 20% of high school shootings occur in rural locations whereas over 22 % of shootings at IHE occur in urban areas. Flores de Apodaca et al. (2012) performed a study of 138 schools where shootings had occurred to determine the differences between random and targeted shootings and their findings indicate that college campuses and lower education institutions were far more likely to have a targeted shooting than a random one. Their research also indicated that all school levels were more likely to be random or targeted in urban or suburban settings as opposed to rural locations, contrasting Agnich's work that revealed

a much higher rate for high schools in rural settings than urban or suburban, and also contrasting Flores de Apodaca et al. research which indicated no major increase in rural settings. Furthermore, a recent dissertation on 88 schools that had experienced an act of TSV also contrasted previous findings. Lankford (2015) performed a descriptive statistical analysis and determined the four highest number of shootings per state, indicating Florida—at nine—had the highest number, followed by California, North Carolina, and Tennessee each with seven shootings. Thus, three of these states are located in the southern region, supporting Agnich's findings, but there is one outlier, California, that does not support previous results. Furthermore, Lankford also identified shootings by location and found 47.3 % occurred in the urban setting, 39.77% occurred in the suburban setting, and only 12.5% occurred in the rural setting, again contrasting previous research from Agnich but supporting findings from Flores de Apodaca. While not a quantitative study, Bushman et al. (2016) recently summarized previous work on location, determining from several studies that TSV incidents typically occur in small, rural or suburban towns, reporting a rate of 92% in one study from 2004. While it is clear to see the necessity to include both region and location in the current study, these two aspects also require further research to identify if there are significant differences between shootings perpetrated by juveniles, which are predominantly in lower educational environments, and those committed by adults, which largely occur in IHE.

Methodology

This quantitative study analyzed the archival data using a logistic regression; both archival data and logistic regression have been utilized in previous studies on TSV. Agnich (2015), Flores de Apodaca (2012), and Lankford (2015) each used archival data to collect their

information on various aspects of TSV for quantitative purposes. Collecting data in this manner provides the researcher with the ability to obtain a large amount of information about a unique, vulnerable population that researchers may otherwise not have access to. It also allows the researcher to code the information in order to run the best analysis for the data, in this case the logistic regression. Logistic regression is a predictive analysis frequently used when DVs are dummy coded categorical variables and the IV is ratio, as is the case in the proposed study, and therefore is appropriate to answer the aspirations of this study. There are advantages to using dummy coded variables, according to Pampel (2000), as their mean equals the proportion of cases with a value of 1, and then can be interpreted as a probability. This analysis will be advantageous in the proposed study on TSV, as many of the events are discrete, meaning they either occurred or did not. Flores de Apodaca (2012) utilized logistic regression for their study on TSV to determine outcomes of fatal shootings occurring or not and if the act was targeted or random. Furthermore, Nevasil et al. (2015) utilized logistic regression to analyze data for one of the research questions regarding TSV, specifically comparing shootings to nonshootings and weapons (firearms) or other weapons. Logistic regression is the most appropriate data analysis method for the proposed data collection, and one that has been applied to other TSV studies.

Summary

The intent of this study was to determine if age is related to various TSV characteristics both associated with the individual who perpetrated the act and the incidents themselves. Uncovering this relationship could be useful for mental health professionals, law enforcement personnel, and educators, particularly those who are utilizing threat assessment as a means of thwarting these attacks. The review of literature focused on two specific theories that offer a

lens through which these acts can be viewed and more fully understood, in addition to providing

concrete rationale for the inclusion of each of the variables in the personal, event, and ecological

categories. The extant literature on this subject is sparse, particularly in the realm of quantitative

studies, and therefore specific characteristics need to be further analyzed in order to gain a more

thorough understanding of both the offenders and the occurrences in order to lessen the

frequency of TSV events from transpiring in our nation's schools.

Chapter 3: Research Method

Introduction

The purpose of this research was to determine if a relationship exists between age and variables in personal, event, and ecological categories for threat assessments and interventions utilized by law enforcement, mental health professionals, and educational personnel. This chapter will describe the research design and rationale for carrying out said research, identify the population of TSV offenders for the study, describe the sample and sampling procedures, explain the data collection method, operationalize each variable for the proposed study, and identify potential barriers to the data analysis. Furthermore, threats to validity will also be identified and ethical concerns will be explored.

Research Design and Rationale

This study utilized a quantitative approach to analyze numerical data collected from the TSV offenders. An external secondary data analysis was conducted using archival data collected from local, state, and national news articles obtained through the LexisNexis database and from professional journals and scholarly publications. This research design was the most appropriate design choice to answer the research questions regarding the relationship between age and the personal, event, and ecological variables associated with TSV offenders, as access to this vulnerable population is not permitted for the current study. While collecting the data through archives is the most appropriate choice for this type of study, it did entail a lengthy process as each offender needed to be identified and located, and subsequently each variable's information needed to be traced in order to complete the data for that subject. This meant identifying multiple news reports on each offender, which was time consuming and arduous. However, it

was necessary to obtain as much information about each offender relevant to the variables as possible in order to avoid missing data for the logistic regression analysis.

The IV for this study was age of the offender; the DVs were the personal, event, and ecological categories with 10, nine, and seven variables respectively. Specifically, personal variables include: discipline; academic achievement; social status; if the offender was a student; precipitating events, if the precipitating event was acute or long term, and if the prior circumstance involved bullying; criminal history; mental health history; and suicide. In addition, event variables included: number of dead, number of wounded, time of day incident occurred, time to carry out the act, weapons used, leakage, and if the offender carried out the act alone or with a partner. Finally, the ecological variables were region and type of location. Location type will be identified as urban, rural, or suburban. Region was if the event occurred in the Western, Midwestern, Southern, or Northeastern region of the United States; the states by region are listed in Table 1.

Measurement levels for the personal DV were primarily categorical, with the exception of academic achievement, which is ordinal. Measurement levels for the event DVs are three at the ratio measurement level (number of dead, number of wounded, and time to fruition); all other event variables are categorical. Ecological variables were all categorical, and dummy variables were utilized for all of the categorical variables. For example, discipline was coded as 0 for no history of discipline issues and 1 for yes there was a history of discipline issues, thus utilizing dummy coding. Another example of a categorical variable coding was, for example, social status which was coded as 0 for loner, 1 for few friends, and 2 for many friends. Basic demographics were also included in this study and were: grade, age, sex, race, and socioeconomic status. These

were collected in the same manner as the other variables in the study. For a complete list of all variables including demographics, see Table 2.

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Population

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The target population for this research was all TSV offenders who have committed an attack from 1966 to 2015. This period marks the current epoch that included the post-American Civil Rights era when schools in the United States experienced significant changes; the data collection can also begin with the notorious Whitman Texas bell tower shooting in 1966 (Ferguson et al., 2011). This timeframe provided a more recent focus on school shootings, which streamlined the analysis, allowing for current, meaningful recommendations for threat assessment purposes. The offenders were identified through two databases, as according to Flores de Apodaca et al. (2012) the two "authoritative compendia" of TSV attacks are *Fatal School Shootings in the United States* and the *National School Safety Center*, which are the most valid, comprehensive lists of all acts of TSV in the United States; all subjects were collected from these two federally funded databases which are compiled annually (p. 368). The target population was not delimited by race, gender, nor age, but instead included the total population of TSV offenders during that time period. The estimated population size will be approximately 150 to 200 individuals. The population will include all individuals who entered onto a school property with the intent of carrying out targeted violence on a known or knowable individual, group, or institution, and completed their attack.

<div align="center">

Sampling and Sampling Procedures

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This study utilized nonprobability sampling. Specifically, this study used a purposive sampling technique. According to Frankfort-Nachmias and Nachmias (2008), purposive

sampling, which can also be referred to as judgment sampling, is commonly used among social

scientists for two specific reasons which are when the sampling size is relatively small or when

the population shares an uncommon characteristic. Thus, TSV offenders fit into both of the

aforementioned categories as the sample size was less than 200 individuals, and those individuals

share a very uncommon characteristic of carrying out an act of TSV in the school setting. When

using the purposive sampling technique on an entire population, the strategy is referred to as total

population sampling (Field, 2013). Therefore, a purposive total population strategy in this

research was the primary research strategy to analyze the quantitative data collected by using

archival data.

Archival Data

Archival data, the secondary data type for this proposed research, is a popular method

utilized in the forensic realm for several reasons. According to Turiano (2014), archival data is

currently used by thousands of researchers and is able to produce a more diverse population than

the researcher may otherwise have access to, which can be both more time and cost efficient than

attempting to reach the population. In addition, Turiano also noted that it is an extremely

beneficial method of data collection for researchers who do not have access to a specific

population. Due to the fact that the majority of TSV offenders who have survived their attack

are currently incarcerated and thus considered members of a vulnerable population, the only

method for collecting data on this population is through archival data. This archival data was

collected using the LexisNexis and ProQuest National Newspapers databases in order to obtain

all relevant information on the offender's demographics and personal, event, and ecological

variables. By using this method of data collection the research included the total population of

TSV offenders that perpetrated an act in the United States from 1966 to 2015, and was not forced to exclude any member of the sample due to the status of being considered a member of a vulnerable population.

A list of all known perpetrators of TSV was compiled from *Fatal School Shootings in the United States* and the *National School Safety Center* to serve as a complete enumerated sample. In order to obtain information on demographics, personal variables, and event variables, Lexis-Nexis Academic database was utilized, and the option "Major U.S. & World Publications; Web Publications; Legal; and Newswire Services, TV & Radio Broadcasts" were selected. One barrier to collecting the data in this manner is that many of the articles that predate 1990 might not be included in the search, thus an additional database—Historical Databases—may need to be selected in order to have access to records of incidents that occurred prior to 1990 (Lowry, 2009). The aforementioned search criteria were used for each perpetrator gathered from the two lists of TSV offenders.

Region was easily identified for the current study as each location of the shooting was listed in the media; the researcher obtained the state of occurrence and categorized it into the region using Table 1. However, type of location—urban, rural, or suburban—needed to be obtained through other methods. Therefore, the classification of urban, rural, or suburban was gathered using the U.S. Census Bureau's Census 2010 to acquire information on location of incident.

Table 1

States by Region

Western	Midwestern	Southern	Northeastern
Alaska	Illinois	Alabama	Connecticut
Arizona	Indiana	Arkansas	Delaware
California	Iowa	Florida	Maine
Colorado	Kansas	Georgia	Maryland
Hawaii	Kentucky	North Carolina	Massachusetts
Idaho	Michigan	Oklahoma	New Hampshire
Montana	Minnesota	Louisiana	New Jersey
Nevada	Missouri	Mississippi	New York
New Mexico	Nebraska	South Carolina	Pennsylvania
Oregon	North Dakota	Tennessee	Rhode Island
Utah	Ohio	Texas	Virginia
Washington	South Dakota		Vermont
Wyoming	Wisconsin		West Virginia

Operationalization of Variables

After all names had been compiled, the next step in the data gathering process entailed removing all acts that are not considered to be targeted school violence. For example, all acts that were reported as TSV but subsequently were determined to be gang related, a robbery, a suicide, or were carryover from a domestic violence incident were not included in this study. For example, if an incident was reported as a school shooting but was later determined to be of an abusive husband waiting in his car on school grounds to kill the mother of his children as she picked them up from school, then this was not be deemed an act of TSV for the purposes of this study as this was regarded as carryover from previous domestic violence. Only acts of a perpetrator entering on to school grounds with the intent of carrying out an act of TSV on a known or knowable person or institution were included.

Personal variables. Personal variables for this proposed study fall under two categories, either they were considered to be related to the school or not related to the school. For example, a school related personal variable is the student's academic achievement while a personal variable not related to the school is the student's mental health history. Discipline was dummy coded and coded as a 1 for any reported referral or history of discipline issues and coded as a 0 if the report specifically stated the student has no history of discipline issues. Academic achievement was coded as 0 for below average, 1 for average, and 2 for above average. Thus, for example, if the student was in special education courses they will be given a 0 for below average or honors classes the student will be specified as 2 for above average; if the report specifically states the student's academic history, the corresponding code will be provided. The social status variable was coded for 0 as a loner, for 1 with a few friends, and for 2 with many

friends. Therefore, for example, if the media report indicated the student was always seen alone, eating in the cafeteria by themselves, or never interacting with other students, then the variable was coded as 0. If it was reported the student had many friends, or for example had been named homecoming prince as in the Jaylen Fryberg case, then the student will be given a 2 (Kutner, 2015). For the student variable, the perpetrator was marked as a 1 only if he or she were a student at the school where the act occurred at the time they carried out their act; thus the student was given a 0 if he or she was a previous student and no longer attended that school. Precipitating event was coded as 0 for unknown and as 1 for yes; the following category, type, relates to precipitating event as either 0 for acute or 1 for long term precipitating event. Accordingly, if a student had recently been suspended or experienced a breakup with a girlfriend, the student was marked 0 for acute, but if the student had a history of abuse at the hands of a parent the student was given a 1 for long term precipitating event. It should be noted if the perpetrator had an extensive history of severe mental illness, then they were also provided a 1 for long term precipitating event. The next variable, circumstance, also relates to precipitating event and entails bullying; therefore, if it was reported consistently that the student had a history of being bullied, then they were given a 1 for bullying, but if no bullying was reported or indicated, the student will be given a 0 for other type of circumstance related to a precipitating event.

 Criminal history was dummy coded for 1 if there was any reported involvement with police, even if the student was not arrested, as can commonly occur with juveniles who have no previous criminal history. The researcher opines it is necessary to note that the perpetrator had any history of police involvement as oftentimes there is no history of any criminal or violent behavior prior to these events and police involvement may be some indication that an act were

impending; this also may differ between juveniles and adults. Mental health history was coded as a 1 for any previous history of diagnosis, treatment, or family or friend statement. For example, if the report indicated family members believed the student were depressed and stated the perpetrator had been isolating themselves for the past two months, had dropped out of all extracurricular activities, and was no longer socializing with family or friends, then the offender received a 1 for yes to mental health history. Suicide was dummy coded for 0 for no suicide, but will be given a 1 for either suicide that resulted in death or survived suicidal attempt. The offender was provided a 0 for no if they were shot and killed by law enforcement.

Event. Number of dead and number of wounded was reported as ratio data, and the numbers were gathered from several sources using the most recent information, as this provided the most accurate account of dead and wounded, and also afforded a timeframe that allowed for the wounded to be included in the death toll if they eventually did not survive the attack. The offender was not be included in the number of dead if they did not survive. Time to fruition was also be on a ratio measurement level and ranged from the time the weapon was drawn or the first shot fired to the time when law enforcement stopped the perpetrator or the student committed suicide. The ratio scale used minutes and if, for example, the incident turned into a barricaded or hostage situation and lasted for three hours, then the time to fruition was marked as 180. Time of day was coded as 0 for AM and 1 for PM. Weapon was divided into categories and coded for dummy coded for gun, knife, and both for a gun and knife of any type, a bomb, rope, or any other device meant to assist in carrying out the TSV attack. The variable of alone or with a partner was coded as 0 for alone and 1 for with a partner, but was only coded as 1 if the actual act occurred with a partner, regardless of if the planning phase included a partner or not. Finally,

leakage was dummy coded as 0 for no and 1 for yes if there were any reports of the offender

stating or writing information of a warning or threat based nature. For example, if a student

posts on social media, even what may be deemed a benign threat, that students at their school

will be sorry tomorrow and an act does transpire, then leakage was coded as a 1 for yes. Other

examples of leakage may be a student paper being turned in for an English course that has

violent themes toward school members or prerecorded videotape, either left behind or sent to the

media prior to the attack, detailing motivation. For a list of variables by category, the

measurement levels, and the variable values, see Table 2.

Table 2
Information and Dictionary of Variables

Variable	Variable Label	Measurement Level	Variable Values
Group	Juvenile or Adult	Categorical	0 = Juvenile
			1 = Adult
Demographics			
Grade	Grade of TSVO	Ordinal	0 – 24
Age	Age of TSVO	Ratio	6 – 65
Sex	Sex of TSVO	Categorical	0 = Male
			1 = Female
Race	Race of TSVO	Categorical	0 = Caucasian
			1 = Other

(*table continues*)

SES	Socioeconomic Status	Categorical	0 = Low
			1 = Middle
			2 = High

Personal SR

Discipline	Discipline Referrals	Categorical	0 = No
			1 = Yes
AcAchiev	Academic Achievement	Ordinal	0 = Below Average
			1 = Average
			2 = Above Average
Social Status	Social Status	Categorical	0 = Loner
			1 = Few Friends
			2 = Many Friends
Student	Student	Categorical	0 = Not Student
			1 = Student
PrecEvent	Precipitating Event	Categorical	0 = Unknown
			1 = Yes
Type	Acute vs. Long Term	Categorical	0 = Acute
			1 = LongTerm
Circ	What was the Event	Categorical	0 = Other
			1 = Bullied

(table continues)

Personal NSR

CrimHx	Criminal History	Categorical	0 = No
			1 = Yes
MHHx	History of Mental Health Challenges	Categorical	0 = No
			1 = Yes
Suicide	Suicide or Not	Categorical	0 = No
			1 = Yes

Ecological

Setting	Urban	Categorical	0 = No
			1 = Yes
	Rural	Categorical	0 = No
			1 = Yes
	Suburban	Categorical	0 = No
			1 = Yes
Southern	Southern Region	Categorical	0 = No
			1 = Yes
Northeastern	Northeastern Region	Categorical	0 = No
			1 = Yes
MidWestern	MidWestern Region	Categorical	0 = No
			1 = Yes

(*table continues*)

| Western | Western Region | Categorical | 0 = No |
| | | | 1 = Yes |

Event

Dead	Number of Dead	Ratio	0 - 50
Wounded	Number of Wounded	Ratio	0 - 50
Time	Time of Day	Categorical	1 = AM
			2 = PM
TimeFrui	Time to Fruition	Ratio	0 = 1000 min
Weapon	Gun	Categorical	0 = No
			1 = Yes
	Knife	Categorical	0 = No
			1 = Yes
	Both	Categorical	0 = No
			1 = Yes
AlonePart	Alone or Partner	Categorical	0 = Alone
			1 = Partner
Leakage	TSVO Told Anyone	Categorical	0 = No
			1 = Yes

Data Analysis, Missing Data, and Multiple Imputation

Logistic Regression

Logistic regression was used to analyze the data for the following research questions.

Research Question 1: How does age relate to the probability of change in the personal variables of discipline, academic achievement, social status, student status, precipitating event, criminal history, mental health history, and suicide for TSV offenders?

$H_0 1$: Age does not relate to the probability of change in the personal variables of discipline, academic achievement, social status, student status, precipitating event, criminal history, mental health history, and suicide for TSV offenders.

$H_a 1$: Age relates to the probability of change in the personal variables of discipline, academic achievement, social status, student status, precipitating event, criminal history, mental health history, and suicide for juvenile and adult TSV offenders.

Research Question 2: How does age relate to the probability of change in the event variables of number of dead, number of wounded, time of day, time to completion, weapons, perpetrated alone or with a partner, and leakage for juvenile and adult TSV offenders?

$H_0 2$: Age does not relate to the probability of change in the event variables of number of dead, number of wounded, time of day, time to completion, weapons, perpetrated alone or with a partner, and leakage for juvenile and adult TSV offenders.

$H_a 2$: Age relates to the probability of change in the event variables of number of dead, number of wounded, time of day, time to completion, weapons, perpetrated alone or with a partner, and leakage for juvenile and adult TSV offenders.

Research Question 3: How does age relate to the probability of change in the ecological variables of location and region for juvenile and adult TSV offenders?

H_03: Age does not relate to the probability of change in the ecological variables of location and region for juvenile and adult TSV offenders.

H_a3: Age relates to the probability of change in the ecological variables of location and region for juvenile and adult TSV offenders.

Logistic regression was utilized to predict if age is related to any of the variables in the three aforementioned categories. Logistic regression can be used to describe the data when the IV is ratio and the DVs are binary or categorical, as they are in this proposed study (Field, 2013). In order to reveal the relationship between the variables, logistic regression calculated the log—or natural logarithm—odds that the event will occur. Relationships between age and the DVs were provided by the ratio of the probability of the influence occurring to the ratio of the probabilities of this not occurring, with the higher values indicating a higher probability of influence occurring and lower values indicating a lower probabilities of influence occurring; a positive odds ratio indicated that as age increases the event is more likely to occur and a negative value will indicate the that as age increases an event is less likely to occur (Field, 2013). According to Pampel (2000), the regression coefficients provide a valuable explanation when the DV are categorical, as every one unit of change in the logit of the DV can either increase or decrease the predictive probability of the IV, and these can be presented as odds ratios (*OR*) after exponentiating the coefficients. There will be *OR* and 95% confidence intervals for *ORs* for each of the predictors; all tests were run with $\alpha = .05$. The data was analyzed using SPSS. Logistic

regression was used for all categorical data; however, for the ratio data a Pearson product-moment correlation was the analytic strategy.

Missing Data and Multiple Imputation

There are three possible ways that missing data could occur. According to Little, Jorgensen, Lang, and Moore (2014), the data could be classified as missing completely at random (MCAR), missing at random (MAR), or missing not at random (MNAR). MCAR, according to Little et al., almost exclusively occurs in controlled environments whereas MNAR usually transpires when a subject decides not to answer a presented question. For example, if a subject did not want to disclose that he smoked marijuana, as this is an illegal behavior in most states, then the data would be considered MNAR. Finally, MAR data is due to a predictable reason, and according to Little et al. is easily estimated because it is then considered a random effect. If any data is missing in this proposed study, it will be due to the fact that the newspaper simply did not have the information or did not report it; therefore, since there is no controlled environment associated with this study and there are no participants refusing to answer any questions associated with the study, it is proffered the data will be considered MAR. Hence, multiple imputation (MI) will need to be performed in order to replace the missing data. There are numerous assumptions that must be met in order to use MI: first the data must be considered MAR or MCAR, and it is proposed this data will be considered MAR; next the imputed data generator model must be accurate and all predictor and dependent variables must be used to maintain variance; lastly, the analysis model must match the imputed data model (Little et al., 2014). After collection of data is complete, the analysis and imputed model will be analyzed to determine if these assumptions will be met. Then the researcher can perform the MI and,

according to Little et al. this requires inputting plausible estimates of what the data may have been if it were reported. Little et al. reported that MI is in no way simply making up data, but instead calculates several plausible estimates in order to provide potential values for the missing data.

Threats to Validity

One threat to the validity of this study will possibly be the missing data, and procedures to overcome this threat have been described in the previous section regarding missing data and MI. Another threat to validity was experimenter bias. According to Goodwin and Goodwin (2012), when researchers are utilizing archival data they are provided an enormous amount of information that they must decide to either include or exclude. However, Goodwin and Goodwin also stated this simply depends on the creativity of the researcher and the study design. Furthermore, experimenter bias can occur if the researcher chooses to only include data that will either support the hypotheses or if the researcher interprets the information in a biased manner in order to align with the researcher's expectations (Goodwin & Goodwin, 2009). While experimenter bias using archival data may appear to be unavoidable to a certain degree, this researcher plans on including every subject that falls under the definition of TSV offender, collected only data associated with the three categories of variables, and collected data using the aforementioned criteria listed in the operationalization of each of the variables.

Ethical Procedures

Informed consent was not necessary as permission from the offenders was not required due the fact that all information was collected through public domain online sources such as newspaper articles; no identifiable data such as name of the offender or name of the school were

included to protect anonymity. The data was securely stored on the researcher's computer, which is password protected; backups of the data were stored on flash drives and secured. All data was deleted upon completion of the research project. Institutional Review Board (IRB) approval was required; the IRB offers an alternative application for archival data collection, Form A for DNP students: Ethics Pre-application, and this was used to obtain IRB approval.

Summary

This study was proposed with the intent to identify if there is a relationship between age and the personal, event, and ecological categories associated with acts of TSV. The study utilized an external secondary data analysis, identifying specific variables and their measurement levels, all collected from two authoritative compendia. A purposive total population strategy was utilized and logistic regression was the analysis, as this was driven by the types of data that were collected and coded using dummy variables. If missing data does occur, multiple imputation will be initiated in order to alleviate the concern, thus allowing for a complete analysis of all data which will be reported in Chapter 4.

Chapter 4: Results

Introduction

The purpose of this study was to examine the relationship between age and the criterion variables in personal, event, and ecological categories associated with targeted school violence (TSV). The three research questions and corresponding hypotheses were provided in Chapter 3 and will be further delineated in this chapter. The hypotheses were developed to test the relationship between age and 26 variables in the aforementioned categories, including 10, nine, and seven variables respectively, to determine if age relates to the probability of change in the variables. The original number of variables changed from 19 to 26 due to the analysis required for the measurement level of certain variables and will be further explained in this chapter. This chapter also provides information on procedures for data collection and sample characteristics, includes descriptive statistics for demographics, identifies assumptions related to the analyses performed, and provides results associated with the three research questions and their hypotheses.

Data Collection

Data were collected over a seven-week period beginning in October of 2016 via archival data sources. From the subsequent search using *Fatal School Shootings in the United States* and the *National School Safety Center*, a sample of 130 (*N*=130) subjects was obtained and the necessary data regarding each subject were acquired. These necessary data on the 26 variables were taken from various sources found through the LexisNexis database including local, state, and national newspapers and an assortment of reputable websites. The one discrepancy with data collection entailed an exclusion of Historical Databases to acquire information that predated

1990, as these articles were easily obtained through simple Google searches. Furthermore, there were also two reporting discrepancies worth noting. Originally, the proposed data analysis entailed running logistic regression for all categorical data and Pearson's product-moment correlation for the ratio data. However, because two of the variables—social status and academic achievement—were ordinal, a further analysis, Spearman's rank-order correlation analysis, needed to be performed. Furthermore, the number of variables needed to be changed for setting to include separate categories labeled 1 for urban, 2 for rural, and 3 for suburban and for weapon to be separated into 1 for gun, 2 for knife, or 3 for both; these changes occurred in order to perform the logistic regression as this analysis requires data to be categorical as opposed to ordinal. One final change pertained to the missing data. Originally it was proposed that multiple imputation would be necessary if there were large quantities of missing data; however, there were no large quantities of data missing and, according to Field (2013), SPSS used an iterative process in order to estimate the parameters of the model and then approximate those parameters when minimal missing data occurs. Because there were very few variables with missing data and SPSS utilized estimation procedures, it was not necessary to perform multiple imputation.

The demographic information collected for each subject included: age, sex, race, and socioeconomic status. The total sample size was 130 subjects and age ranged from six to 62 with a median age of 18.5, 94% were male, 60% were Caucasian, and 63.8% were from middle-income families (See Table 3).

Table 3
Descriptive Statistics

Measure	*N*	*%*
Race	130	100
Caucasian	78	60
Other	52	40
Sex	130	100
Male	122	94
Female	8	6
SES	123	100
Low	25	19.2
Middle	83	63.8
High	15	11.5

This sample included all TSV offenders between the timeframe of 1966 to 2015 in the United States, and based upon previous research of the total population this sample is representative as research indicates TSV offenders are most often Caucasian males from middle class socioeconomic backgrounds (Bushman et al., 2016).

Results

In keeping with the purpose of the study, an analysis of the relationship between age and a number of criterion variables was carried out using logistic regression, Pearson's correlation, and Spearman's correlation. In order for logistic regression to be utilized, the predictor variable must be numerical and the criterion variable must be categorical with only two values, and for this study the dichotomous variables were 0 and 1. For Pearson's correlation, both predictor and criterion variables must be interval or ratio and for Spearman's correlation one or both of the two variables must be ordinal with more than two categories; in this study, each variable analyzed through Spearman's correlation had three categories. In addition and including the dichotomous nature assumption of the dependent variable, in order to perform logistic regression two other assumptions must be met and they are assuming the likelihood of a relationship occurring and using the correct model. All assumptions were met for this study.

Research Question 1

The first research question asked: How does age relate to the probability of change in the personal variables of discipline, academic achievement, social status, student status, precipitating event, criminal history, mental health history, and suicide for juvenile and adult TSV offenders? The null hypothesis for research question 1 stated $H_0 1$: Age does not relate to the probability of change in the personal variables of discipline, academic achievement, social status, student status, precipitating event, criminal history, mental health history, and suicide for juvenile and adult TSV offenders. The alternative hypothesis was $H_a 1$: Age relates to the probability of change in the personal variables of discipline, academic achievement, social status, student

status, precipitating event, criminal history, mental health history, and suicide for juvenile and
adult TSV offenders.

All statistical findings for the personal variables using logistic regression can be found in
Table 4 and personal variables using Spearman's correlation coefficient can be found in Table 5.
Statistical significance ($p < .05$) was found in four of the personal variables: student,
circumstance of precipitating event, criminal history, and mental health history, and all effects
sizes (*ORs*) were small. Specifically, for every one year of increase in age, the likelihood of the
TSV offender being a student decreases by 8.8%. Circumstance associated with precipitating
event was coded as 1 if the offender was bullied and 0 if another precipitating event occurred. It
was determined that for every one year of increase in age, the likelihood of being bullied
decreased by 7.6%. And finally, for every one year of increase in age, the likelihood of having a
criminal history background or mental health history background increased by 6.7% and 7.5%
respectively.

The Spearman's correlation coefficient for age and social status was also significant ($r_s =$
$.40, p < .001$). This suggests that as age increases so social status will increase, that the
relationship is moderate to strong, and that the percentage of variation in social status that can be
determined by age is 16% ($r^2 = .16$). The other personal variable analyzed using Spearman's
correlation coefficient, academic achievement, was not significant ($r_s = .096, p > .05$) (See Table
5).

Table 4

Logistic Regression and Odds Ratios Using Age as a Predictor

							95% C.I. for OR		
Measure	*β*	*SE*	*Wald*	*df*	*p*	*OR*	*Lower*	*Upper*	*R²*
Student	-.088	.021	17.596	1	.000*	.916	.879	.954	.225
Discipline	.004	.018	.059	1	.807	1.004	.969	1.041	.001
Prec Event	.036	.030	1.370	1	.242	1.036	.976	1.100	.023
Type	-.021	.017	1.474	1	.225	.980	.947	1.013	.015
Circ	-.076	.034	4.930	1	.026*	.926	.866	.991	.086
Crim Hx	.067	.019	12.245	1	.000*	1.070	1.030	1.111	.147
MH Hx	.075	.025	9.097	1	.003*	1.078	10.27	1.131	.125
Suicide	.034	.017	3.853	1	.050	1.034	1.000	1.070	.041
Northern	.025	.019	1.809	1	.179	1.025	.989	1.064	.021
Southern	-.036	.022	2.2675	1	.102	.964	.923	1.007	.034
Midwestern	-.024	.025	.972	1	.324	.976	.930	1.024	.013
Western	.024	.017	1.982	1	.159	1.024	.991	1.059	.021
Urban	-.033	.024	1.916	1	.166	.967	.923	1.014	.026
Rural	.007	.017	.192	1	.661	1.007	.975	1.041	.002
Suburban	.031	.017	.579	1	.447	1.013	.980	1.046	.006

(*table continues*)

Time	.035	.017	4.088	1	.043*	1.035	1.001	1.071	.044
Gun	-.019	.023	.692	1	.405	.981	.939	1.026	.010
Knife	.061	.028	4.823	1	.028*	1.063	1.007	1.123	.086
Both	-.048	.049	.966	1	.326	.953	.865	1.049	.026
Alone/Part	-.150	.098	2.345	1	.126	.861	.711	1.043	.101
Leakage	-.015	.017	.771	1	.380	.985	.954	1.018	.008

The effects size conventions for Odds Ratios are: *ORs* of 1.44 = Small Effect, 2.47 = Medium

Effect, and 4.25 = Large Effect.

* $p < .05$

Table 5
Spearmen's Correlation Coefficient Using Age as a Predictor

Measure	r_s	p
Social Status	.40*	.00001
AcadAchiev	.096	.2773

Research Question 2

Research question 2 was: How does age relate to the probability of change in the event

variables of number of dead, number of wounded, time of day, time to completion, weapons,

perpetrated alone or with a partner, and leakage for juvenile and adult TSV offenders? The null

and alternative hypotheses were: H_02: Age does not relate to the probability of change in the

event variables of number of dead, number of wounded, time of day, time to completion,

weapons, perpetrated alone or with a partner, and leakage for juvenile and adult TSV offenders

or H_a2: Age relates to the probability of change in the event variables of number of dead, number

of wounded, time of day, time to completion, weapons, perpetrated alone or with a partner, and

leakage for juvenile and adult TSV offenders. Two of the variables in this category, time event

occurred and weapon, were statistically significant ($p < .05$). Logistic regression analysis was

used for both variables. Time event occurred was statistically significant, $\beta = .035$, Wald $\chi^2 (1)$

$= 4.088$, $p = .043$, as was knife, $\beta = .061$, Wald $\chi^2 (1) = 4.823$, $p = .028$. Pearson's correlation

coefficient was used to analyze the data at the interval measurement level, which were number of

dead, number of wounded, and time to fruition; no statistical significance ($p > .05$) was

determined (See Table 6).

Table 6
Pearson's Correlation Coefficients Using Age as a Predictor

Measure	r	p	N
Dead	.072	.414	130
Wounded	.012	.888	130
TimeFrui	.149	.093	128

Research Question 3

Research question 3 was: How does age relate to the probability of change in the ecological variables of location and region for juvenile and adult TSV offenders? The corresponding null and alternative hypotheses were H3$_0$: Age does not relate to the probability of change in the ecological variables of location and region for juvenile and adult TSV offenders or H3$_a$: Age relates to the probability of change in the ecological variables of location and region for juvenile and adult TSV offenders. Logistic regression was used to analyze all ecological variables. No statistical significance ($p > .05$) was determined for either location or region; therefore, findings failed to reject the null hypothesis.

Summary

The purpose of this study was to determine if age relates to the probability of change in 26 variables associated with TSV. Several discrepancies occurred from reports provided in the previous chapters regarding data analyses. Originally logistic regression was proposed for all categorical data and Pearson's product-moment correlation for all ratio data; however, a third analysis, Spearman's rank-order correlation, was necessary for two variables because there measurement levels were ordinal. Findings indicate statistical significance in seven of the 26 variables. Statistical significance was determined for the personal variables of student, social status, circumstance, criminal history, and mental health history, therefore supporting the first alternative hypothesis that age does relate to the probability of change in certain variables. In addition, event variables of time event occurred and weapon were also determined to be statistically significant, thus supporting the second alternative hypothesis that age does relate to the probability of change in event variables. Finally, no statistically significance was found in

the ecological variable category, resulting in failure to reject the third null hypothesis.

Based upon this information, the findings will be interpreted regarding the confirmation or extension of existing knowledge on this subject and several recommendations will be made. In addition, this study has several limitations that will be addressed as well as implications for social change. Each of these aforementioned topics will be addressed in Chapter 5.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this study was to determine if a relationship exists between age and 26 variables associated with targeted school violence (TSV). The variables were divided into three categories: personal, event, and ecological, and were analyzed to determine the relationship for current threat assessment procedures. This study arose after a gap was identified in the literature pertaining to age of the offender, as this particular phenomenon had not yet been studied even though each of the 26 variables had been included in previous TSV research (Agnich, 2015; Bushman et al., 2016; Lankford, 2015). Therefore, a quantitative analysis was performed using a purposive total population strategy on 130 subjects; the data were analyzed using logistic regression, Pearson's correlation, and Spearman's correlation. Statistical significance was determined to support two of the three alternative hypotheses. Specifically, in the personal category significance was determined for the individual being a student at the time of the offense, for social status, for the precipitating circumstance involving bullying, and for a history of mental health and criminal challenges. In addition, significance was determined in the event category for time the event occurred and weapon choice, specifically if a knife was involved in the attack. No significance was found for any of the ecological variables, thus failing to reject the third null hypothesis.

Interpretation of Findings

There is a paucity of quantitative studies performed on TSV. In fact, according to Ferguson et al. (2011), this type of research is near nonexistent. However, of the extant studies on the subject, several have utilized many of the criterion variables associated with this study.

While it is possible confirmation and disconfirmation exist as these results relate to previous research, it should be noted that this study was performed with a specific aim in mind, which was to determine the relationship between age and the 26 variables using a predictive measure, logistic regression.

Variables

Previous research has reported basic statistics on percentages of certain variables as they relate to incidents of TSV; for example, 81% of offenders engaged in some form of leakage, such as telling friends, posting on social media, or writing about a plan for an English assignment, prior to their event (Bushman et al., 2016). While leakage was a component found to have been performed by many of the 130 subjects in this study, that was not the aim of this study and therefore not reported in the same manner. For example, even though no statistical significance was determined for leakage as it related to age, leakage did occur in 56% of the 130 subjects. Thus, the major confirming contribution to previous research lies in the fact that each of these variables, however reported in previous research, did occur in a proportion of the cases, but that information exceeds the scope of this study as this study used logistic regression for prediction purposes. Therefore, this study confirms the previous research on variables, and also extends that research to identify their relationship to age. Another confirmation to existing literature occurred in the results for basic demographics with noted exceptions. Previous research indicated Caucasian males overwhelmingly commit these acts, the average age of attacker was 16, and the offenders were from relatively affluent backgrounds (Flores de Apodaca et al., 2012; Haan & Mays, 2013). This study confirmed that males committed 94% of the acts and that 63.8% of the subjects were from middle class families; however, the current study found only 60% of the

subjects were Caucasian, and that the median age was 18.5. Thus, this study confirmed overwhelmingly that these acts are committed by males from relatively affluent backgrounds, but disconfirmed that the perpetrators are overwhelmingly Caucasian as there were 40% of the subjects that were of another ethnic background. Due to the coding method necessary for the logistic regression, there was no further breakdown of the ethnicity as the information was simply coded as 0 for Caucasian and 1 for other ethnicity: however, this could be a potential area for future research. Furthermore, Agnich's (2015) work found the average age of perpetrators of mass killings was 28.03 and the average age of offenders of attempted mass shootings was 18, and noted the distinct difference from previous research. In addition, Agnich also found a discrepancy in previous research that aligns with this study when she determined that, while most offenders are Caucasian males, those who commit mass killings without using a firearm were less likely to be Caucasian. While a further comparison of non-Caucasian males who used knives was not within the scope of this study, it could be a potential area for future research. In addition to the demographic information as it related to previous research, each significant variable has been shown to confirm, disconfirm, or extend current knowledge.

Research question one pertained to age as it relates to the probability of change in the personal variables of discipline, academic achievement, social status, student status, precipitating event, criminal history, mental health history, and suicide. Through both the logistic regression and Spearman's correlation, it was determined that age does relate to the probability of change in social status, student, precipitating event, criminal history, and mental health history, therefore supporting the alternative hypothesis. Thus, knowledge has been extended to include that as age increases, so does the likelihood that the student will have a higher social status, be less likely to

be a student, be less likely to have been bullied, and be more likely to have both a criminal and mental health history. Flores de Apodaca et al. (2012) determined that social status was a factor in school shootings, and results from this study confirmed that and extended that knowledge by finding that as age increases, the likelihood of being in a higher social status will also increase, meaning TSV offenders who have few to no friends are more likely to be at the younger end of the age range. One disconfirmation in the personal category entailed criminal history. Previous research by Bushman et al. (2016) indicated that offenders rarely had any criminal history; however, the current study found statistical significance related to age and criminal history, which was as age increased so did the likelihood of having a criminal history background. Bushman et al. also previously reported that offenders were from middle class SES and had a history—even if undiagnosed—of mental health challenges and this study confirmed that research by finding statistical significance for both of those variables, meaning that their likelihood of having a criminal or mental health history increased with age. For example, older subjects were more likely to have been diagnosed with a severe mental illness (SMI) such as schizophrenia or bipolar disorder.

Research question two pertained to how age relates to the probability of change in the event variables of number of dead, number of wounded, time of day, time to completion, weapons, perpetrated alone or with a partner, and leakage, and statistical significance was found in time of day and weapon (knife). There was a paucity of research on time of day, only found in a seminal study by Lowry (2009); thus, this research did determine that as age increased the time of day decreased, meaning that TSV offenders who were younger were more likely to carry out their act in the a.m. as opposed to the p.m., which would be advantageous information for threat

assessment purposes and for law enforcement personnel tasked with the job of protecting schools at the elementary and secondary level. A cautionary note should be included with this information, as simply because there is a higher likelihood that incidents in lower education will occur before noon does not necessarily mean that they have not or will not occur in the afternoon, and the same holds true for the other significant variables as well as institutions of higher education (IHE). In addition, as previously noted Agnich (2015) found that individuals who carry out their attack with a weapon other than a gun (usually a type of blade) were less likely to be Caucasian, thus noted a difference between those who choose to use guns or some other form of a weapon. This study also found a statistically significant difference in weapon choice, as it was determined that as age increased, so the likelihood of choosing a knife as opposed to a gun increased. This is interesting information as adults have easier access to purchasing guns than do younger individuals, which one could surmise would make this a more practical option as it has been determined in previous research that there is a higher death toll with the use of a gun as opposed to a blade (Agnich, 2015). However, this information could also coincide with the previous diagnosis of a SMI or conviction for a serious criminal offense, as both may result in the inability to purchase a firearm. Furthermore, Meloy et al. (2014) also studied weapon choice in previous research and found a much higher likelihood of the offender using a gun (78%) than a knife (22%). Again, basic statistics were reported for Meloy et al. work as opposed to logistic regression, but this study can confirm there is a difference in weapon choice, and can also extend the knowledge to include age as a factor. Finally, results from research question three also yielded comparative results to previous research.

Age was also related to the probability of change in the ecological variables of location and region in research question three, and these variables have both been included in previous research. Agnich (2015) found differences in lower education and IHE with regard to location, determining that IHE had more urban and rural mass shootings whereas more mass killings occurred in elementary schools in rural and urban areas. Moreover, Agnich's work also found approximately 20% of high school shootings occurred in rural locations whereas 22% of IHE shootings occur in urban areas. Furthermore, she also determined that higher numbers of mass shootings, mass killings, and attempted mass shootings occurred more frequently in southern regions. Lankford (2015) also found a difference in region, determining that most shootings occur in the southern region. This study found no statistical significance for either location or region, meaning as age increases there is no higher or lower likelihood of the events transpiring more often in one or more locations or regions. Thus, the only confirmation gleaned from this research in the ecological category to previous research is that TSV does occur in each of the aforementioned regions and locations.

Theoretical Framework

The findings of this research support the two theories used to lend a viewpoint toward understanding acts of TSV, general strain theory (GST) and ceremonial violence theory. Specifically, statistical significance found for the variables of social status and circumstance involving precipitating event support GST, whereas the statistical significance found in time of day and weapon support ceremonial violence theory; social status and mental health history can also support this theory. GST theory states that strain occurs when individuals fail to meet the positive goals they are trying to achieve, when they have lost something they value, and when

they have been subjected to an aversive stimulus such as violence or negative experiences

(Broidy, 2001). The results of this study indicate that as age increases, so does social status,

which means that younger students who commit these acts are less likely to have friends. This

correlates to the fact that these students have failed to reach the positive goal of having friends, a

well-known coveted achievement sought by adolescents which, fitting with Agnew's theory,

may indeed have caused them strain and acted as a catalyst to their violence. The third portion of

GST theory pertains to an aversive stimulus causing strain and resulting in violence. Results of

this study indicate that bullying occurred as a precipitating event, and it was found that as age

increased the likelihood of the individual being bullied decreased. This means that younger TSV

offenders are more likely to have experienced the aversive stimulus of bullying, experienced

strain, and as a result carried out an act of TSV. In addition to the support lent toward GST, two

variables can also be more fully understood through aspects of ceremonial violence theory.

Ceremonial violence theory encompasses the individuals creating a ritual as a means of

committing suicide, directly as a result of finding themselves in a low social status, becoming

depressed, and wanting to end their own lives (Van Brunt, 2015). However, they often have

narcissistic tendencies and choose to make a public event out of the act, and therefore go through

a great deal of planning by choosing the time, weapon, location, and quite often leaking the

event. As previously noted, age is a factor in these offenses and the younger the offender, the less

likely they are to have a large number of friends, thus aligning with the low social status of the

first portion of ceremonial violence theory. In addition, this lack of social support and network

often leads to depression or a history of mental health challenges, again making them more likely

to act out in a violent manner. Finally, once the offender has committed to carrying out an act of

TSV, they begin the planning phase by choosing various aspects of the event such as time, location, and weapon. Therefore it is clear to surmise that ceremonial violence theory can be used to understand why a student who is low in social status and has become depressed chooses to carry out an act of TSV to end their own lives and puts a great amount of time and effort into planning and meticulously carrying out the act by choosing the specific time of day and weapon choice. And, as a result of this study, it can be gleaned that within this planning younger offenders are more likely to carry out their acts earlier in the day and older offenders are more likely to choose a knife as opposed to a gun.

Implications of the Findings

While some of the results determined in this study may seem rather axiomatic, with a further, in-depth look it is clear to see the validity posed for threat assessment purposes and for positive social change. For example, it is an evident concept that with increase in age comes an increase in the likelihood that a perpetrator may have acquired either a diagnosable mental illness or criminal background; however, looking further into the scenario, it is clear that there are valuable implications for educators and mental health professionals working in IHE. If a student at an IHE is listed as a student of concern and is therefore assessed using standard threat assessment procedures, the fact that they have a diagnosed mental illness or criminal history may now shed some interesting light on the fact that they may indeed be more likely to carry out an act of TSV due to the results of this study. With regard to mental health history, this information may help sway policymakers to push for mandatory reporting of previous mental illness if a student is warranted a concern for violence, adding a proactive security measure to students who may have previously been or may potentially be violent due to their mental health status. For

example, Myron May, a Florida State University (FSU) law student graduate who was experiencing paranoid delusions as a result of his schizophrenia went to the FSU campus brandishing a gun and fired several times before being killed by law enforcement. May's family and several friends had repeatedly called law enforcement to report his strange and disturbing behavior, and knew he had returned back home to Florida. However, because May had not committed any crime nor said he was a danger to himself or others, law enforcement was unable to take any action against him. With several changes in policy, law enforcement would have both his history of mental health illness and be given the responsibility of warning the University that May might be a threat to the campus. These simple policy changes might lead to the positive social change of less TSV attacks by providing IHE with the opportunity to increase security and intervene to get the individual mental health treatment prior to an incident that could have been avoided. Another implication as a result of this study is that older students may appear to be more socially well adjusted and have a network of friends; where they once may have been deemed less of a threat because of this fact, this current research shows that is not necessarily the case because as age increases, so does the likelihood that they will be in a higher social status. Also, with regard to IHE, information could be included in threat assessment protocol for weapon choice, whereas instead of focusing on inquiring if the student has recently purchased or been in possession of a gun, they can now show similar importance to the student's acquisition of a knife. Whereas once this may have been dismissed as an everyday item that students carry, it can now be seen as more of a possible threat. There are also several implications for lower educational settings.

First, results of this study indicate that the younger perpetrators of TSV are more likely to

be students, and again this may appear to be rather axiomatic; however, educational personnel and law enforcement working in lower education settings that remember the Sandy Hook massacre and the fact that Adam Lanza was not a member of the school, but an outsider who entered onto school property, may consider outsiders as more of a threat when in reality, while outsiders still may pose a threat, especially if they have no grounds for being on school property, this research indicates that TSV offenders in lower education are significantly more likely to be students than outsiders. Also, with regard to the bullying, the literature first insisted that bullying was a major contributing factor to a perpetrator carrying out an act of TSV, but after more and more of these incidents occurred and bullying was not found to be present, the researchers then began stating that bullying may not be much of a catalyst; however, this research indicates that younger students who carry out these acts are significantly more likely to be bullied than older perpetrators, and that this type of precipitating event may have acted as a reason for the attack. Therefore it is clear that, especially with younger students, bullying cannot be negated as a contributing factor to incidents of TSV.

These findings have several implications for positive social change. On the individual level, knowing more about the characteristics of TSV offenders at any age can be helpful as it may provide more opportunity to intervene and offer necessary mental health services. This would afford family members or educators who were concerned about the potential perpetrator peace of mind and more security that the individual was receiving help and therefore less likely to carry out a TSV act. In addition, these findings offer more information to threat assessors who may have relied on previous results which reported that, for example, bullying was not a major contributing factor to the younger student or that the adult students are not a threat because they

have a good social network. This additional information can now be taken into consideration

when performing a threat assessment and add to the extant knowledge of TSV offenders in order

to classify the potential perpetrator in the right level and category of threat. Finally, these

findings could assist policy makers in changing current legislature for mental health protocol as

well as educational protocol. As a result of New Jersey versus T. L. O., schools are already

considered hermetic environments with regard to search and seizure, specifically courts require

reasonable suspicion as opposed to probable cause to search a student who is deemed a potential

threat (Nance, 2013). Policy could be changed to include a similar reasonable suspicion for

students diagnosed with a mental illness that may include potential for violence. With this

information, schools would be able to proactively intervene if a student is indicating warning

behaviors often associated with TSV and initiate a behavior plan, with legal ramifications, for the

student to help them cope and continue with their education. This will lead to the positive social

change of more safety and security on campuses, more proactive mental health procedures, and

less TSV attacks.

Limitations of the Study

The first and primary limitation of this study was that it was conducted using archival

data. Archival data was the only option for this research due to the vulnerable status of these

offenders who have survived their attack and as a result are incarcerated. Due to the fact that

archival data had to be utilized, the study was subjected to reporting bias from local, state, and

national newspapers as certain sources chose to report or not report specific variables included in

this study. There were several attempts, normally approximately five to 10, to find all the

information across various sources in order to assuage this bias. However, as previously

mentioned, a small amount of missing data did occur that was unavoidable. Another limitation of this study was the two sources, considered the authoritative compendia, used to obtain all TSV offenders between 1966 and 2015. It is possible that not all perpetrators of TSV were included in these two lists, however, previous research indicated they were the two most inclusive of all subjects and therefore considered the most comprehensive lists (Flores de Apodaca et al., 2012). Finally, there were certain criteria that needed to be met in order to be included as a subject in this study. The criteria were all individuals who have either completed or attempted to complete an act of TSV in the United States between 1966 and 2015; all acts of violence that transpired on school property but were considered carryover from previous domestic violence, gang related, or spontaneous acts, meaning they did not meet the definition of targeted violence which is defined as an incident of violence where a known or knowable assailant chooses a particular target prior to their violent attack and carries out said attack on school grounds, were removed because they did not meet the criteria. Therefore, this study is not generalizable to all populations, even populations of TSV offenders outside of the United States.

Recommendations

First and foremost there is a distinct lack of quantitative research on TSV and that is the primary recommendation for future research. This subject is in great need of further study in several areas in order to broaden the knowledge base and assist mental health professionals, educators, and law enforcement personnel with information that would not only assist in thwarting these attacks, but more importantly with helping the would-be perpetrators prior to committing an act of TSV. The research utilized in this study uncovered some interesting areas that lack evidence-based practice, particularly quantitative studies, such as more research into the

eight warning behaviors—mainly leakage, fixation, identification, and last resort—often present prior to an incident, lack of public policy for preventative TSV measures, and the part social media plays in encouraging an offender who may be contemplating carrying out an attack. This study found statistical significance in seven out of the 26 variables, which means there is more information to be explored on many of the characteristics that have been consistently found in previous research. In addition, understanding the motivations to carry out these attacks is of paramount importance, as understanding the motivations is an important aspect to assist with proactive intervention prior to an incident. Event variables associated with the 130 incidents were included in this study; however, meta-analysis research used to more fully understand current safety and security programs that have been proven either effective or ineffective would also be valuable, for school systems and for policy makers. Moreover, there were 26 variables associated with this study that have been proven to be associated with other TSV offenses, and further analysis of those characteristics would be particularly beneficial, for the student contemplating an act due to loneliness, a sense of isolation, an undiagnosed mental health challenge, or a person who simply does not know how to reach out and acquire help. Further research into these characteristics could also assist school systems, law enforcement, and mental health professionals tasked with the duty of keeping all members of schools safe. Aligning particularly with this study, a similar study in scope and design would be beneficial to uncover differences between male and female offenders or between Caucasian offenders and offenders of other ethnicities. Finally, it is well known that the United States far exceeds to the number of TSV incidents, and therefore a comparison between acts perpetrated in the United States and other nations who are experiencing this phenomenon would be advantageous.

Conclusion

This study arose out of a passion and desire to fully understand not only acts of TSV, but more importantly the people who perpetrate them. While it is true that many of these perpetrators are angry, narcissistic, and acting out in a retaliatory manner against those they perceived harmed them, there are also many perpetrators who are scared, lonely, hurt, and feel as if they have no other choice but to end their lives; either of these scenarios is both heartbreaking and true. The fact remains that an ample amount of research, education, and knowledge is still required to positively affect social change at the school level, community level, and policy level. These acts are tangential, as they impact students, teachers, community members, and policy makers, and the effects after these incidents occur are long lasting and devastating. Lily Tomlin once said, "Somebody should do something about that. Then I realized I am somebody." The fact is that we are all somebody, somebody who can help, who can listen, who can try and understand, who can research, or who can change policy in order to add our small part to this abundantly growing problem. It is only then that we will all make progress toward stopping these senseless acts.

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