

Multi-Victim School Shootings in the United States: A Fifty-Year Review

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This study examined 64 school shooters who committed multi-victim attacks in the United States during the years 1966 through 2015. Results include demographic analysis of age, venues of attack, racial/ethnic identity, magnitude of attacks, and frequency of perpetrator suicide. Data is provided for the sample as a whole, as well as for different time periods to highlight trends over time. Notable results include numerous changes in post-Columbine attacks, including greater age range of perpetrators, more perpetrators who are not white males, increased fatalities, and increased suicide rates.

School violence is a major concern across all levels of education in the United States. Studies of school shooters have focused on a variety of types of violence, in different geographical locations, committed by particular types of perpetrators, and occurring within specific time frames.

In 2000, the Federal Bureau of Investigation released a report based on 14 shootings and 4 potential shootings (O'Toole). In 2002, the United States Secret Service and Department of Education published a study that investigated 41 school shooters involved in 37 attacks from 1974 through 2000 (Vossekuil, Fein, Reddy, Borum, and Modzeleski). Though these reports remain seminal documents in the field, they focused on perpetrators in middle school and high school; they did not include college and other adult perpetrators, nor provide any analysis of changes over time.

Other studies have also been limited to secondary school perpetrators (McGee and DeBernardo, 2002; Verlinden, Hersen, and Thomas, 2000; Meloy, Hempel, Mohandie, Shiva, and

Gray, 2001; and Leary, Kowalski, Smith, and Phillips, 2003). As important as it is to study adolescent school shooters, the exclusive focus on them does not address the full spectrum of the perpetrators of mass school attacks.

Two works by Langman (2009a, 2009b) discussed school shooters from a psychological perspective, dividing them into three types: psychopathic, psychotic, and traumatized. The sample, however, was only ten perpetrators, and the studies contained no demographic or longitudinal analyses. Also, nine of the ten shooters were secondary school shooters, providing virtually no data specific to older perpetrators. A more recent work (Langman, 2015b) investigated 48 perpetrators across all levels of education as well as from five countries outside the United States. Though the study contained demographic data and intergroup comparisons, there was no analysis of changes over time. Also, the inclusion of ten perpetrators from other countries limited the generalizability of the results for the United States.

Agnich (2015) studied multiple types of school violence, including both completed and foiled attacks that occurred in 38 countries. Another broad-based study (Bushman, et al., 2016) explored both rampage school shootings and more common urban violence, presenting risk factors for these different types of incidents. Though these studies were large in scale, they either did not focus solely on the United States or specifically address multi-victim school shootings; nor did they analyze changes in perpetrators and attacks over time.

Using the sniper attack by Charles Whitman at the University of Texas in 1966 as the starting point for modern school shootings in the United States, there are now fifty years of

school shootings to be investigated. Though school violence takes many forms, the focus in this study is on the larger-scale attacks that often strike people as more bizarre and incomprehensible than other types of aggression that occur in educational settings, such as gang violence, intimate partner violence, and the spontaneous eruption of violence at fraternity parties or sporting events. The fact that perpetrators, sometimes surprisingly young, walk into a school and open fire is a particularly disturbing phenomenon. Focusing on this specific type of school violence will hopefully lead to greater knowledge about the perpetrators.

The purpose of this study is to expand the literature by studying not only perpetrators who were secondary school students but those of all ages, and to analyze changes in the shooters and their attacks that have occurred over the last fifty years in the United States.

The study seeks to provide answers to the following questions:

- 1 Have multi-victim school shootings increased in frequency over the last fifty years?
- 2 What types of educational settings are most often attacked? Has this changed over time?
- 3 Who are the perpetrators in terms of age, gender, racial/ethnic identity, and immigration status, and has this changed over time? Does it vary among different groups of shooters?
- 4 Has the magnitude (number of casualties) of multi-victim school shootings changed over time? Does it vary among different groups of shooters?
- 5 What is the frequency of suicide among the perpetrators and has this changed over time? Does it vary among different groups of shooters?

Because this journal is devoted to safety in institutions of higher education, a particular focus will be given to results related to college and university attacks. For ease of reference, the term “college” will be used to refer to all institutions of higher education, including colleges and universities.

THE METHOD AND THE SAMPLE

The incidents included in this study met the following criteria:

- 1 The attacks occurred in education-related settings.
- 2 The attacks involved the use of firearms (though other types of violence may have also been employed).
- 3 The attacks were premeditated. Violence that erupted spontaneously at campus parties, sporting events, in parking lots, or other locations was not included.
- 4 The attacks resulted in at least three victims being killed or wounded (perpetrators who shot themselves or were shot

by police were not included in the victim count).

- 5 The incidents were not a result of rival gang violence.
- 6 The incidents did not consist of intimate partner violence that happened to occur on school property.
- 7 The incidents occurred in the United States during the years 1966 through 2015.

The rationale for these criteria was to have a data set that met several needs: to be focused enough on a particular type of school shooting that the results are not confounded by multiple types of violence; to be large enough to allow for subgroup comparisons; to cover a sufficient timespan to allow for analyses of changes over time; and to be limited to attacks within the United States so that the results are not confounded by international incidents whose populations and dynamics may differ from those in this country.

The method of data collection involved combing scholarly works that provide lists or profiles of school shooters, as well as online lists and databases to identify as many perpetrators as possible. The scholarly works included Fox and Burstein (2010), Langman (2015b), Newman (2004), and Van Brunt (2012). Online sources included *Columbine-angels.com*, the National School Safety Center, School Shooters .info, the Stanford University *MSA* database (“Stanford Mass Shootings in America, courtesy of the Stanford Geospatial Center and Stanford Libraries”), the Violence Policy Center, and *Wikipedia*.

Time Periods 1 and 2

In addition to providing data for the full fifty years, the data was divided into two time periods, with the attack at Columbine High School on 20 April 1999 serving as the dividing line. As noted by Larkin (2009), the Columbine attack was a watershed event that had profound ramifications for subsequent school shootings. This study compares the nature of the perpetrators and their attacks up to and including Columbine (Period 1) to those perpetrators and attacks that occurred after Columbine (Period 2).

This dividing point has the added advantage of resulting in an approximately equal number of attacks in the two periods (34 and 28, respectively), allowing for a fairly balanced comparison in terms of sample sizes. It should be noted that the 34 attacks in Period 1 involved 36 perpetrators because two of the attacks were carried out by pairs of perpetrators.

The fifty years of data will also be divided into other time periods to highlight shifts over time.

Intention vs. Outcome

As explained above, this data set contains only those shooters who killed or wounded at least three people. It should be noted that several shooters intended to kill many people but were stopped or gave up before doing so. Conversely, other pepe-

trators may have intended to limit their attacks to one or two people, but ended up wounding or killing more than this, either deliberately or inadvertently. Though all these perpetrators are of interest in understanding school shooters, the ambiguity in sorting out intention resulted in limiting the sample to those who wounded or killed at least three people regardless of their intentions prior to their attacks.

Similarly, the suicide data include perpetrators who died by their own hand or were killed by police in what is often referred to as “suicide by cop.” Some perpetrators intended to die in their attacks but changed their minds or were apprehended before they shot themselves. Conversely, at least one perpetrator apparently intended to survive and escape, but killed herself when escape became impossible. The suicide data only include those who died in their attacks, regardless of their intention prior to the attacks. At least two of the six perpetrators killed by police left writings and/or made comments during their attacks indicating their intention to die. In the absence of any contrary information, the other four were counted as suicides.

The Sample

The sample consisted of 64 perpetrators who committed 62 attacks (two attacks involved pairs of perpetrators). The shooters ranged in age from 11 to 62. They were 95.3% male ($n = 61$) and 4.7% female ($n = 3$). Other demographic data will be presented below in response to the questions posed by the study. A list of the shooters included in the study is provided in the appendix.

RESULTS

The results are presented in response to each of the five sets of questions. Results have been rounded to one decimal place. Those results that are most notable are presented in boldface.

QUESTION 1

Have multi-victim school shootings increased in frequency over the last fifty years?

Based on this sample, multi-victim school shootings have increased over the last fifty years. Dividing the fifty years into five decades gives the results seen in Table 1.

Table 1: Number of School Shootings by Decade

Decade	N =
1966 to 1975	3
1976 to 1985	8
1986 to 199	14
1996 to 200	18*
2006 to 2015	19

*The 18 incidents involved 20 perpetrators because two of these attacks were committed by two people.

If the 50-year period is divided into two 25-year periods, the results are that 17 attacks occurred during the first 25 years and 45 attacks during the second 25 years. Though it is possible that these results are skewed due to more recent events being better documented, the magnitude of the change suggests an actual increase in frequency.

QUESTION 2

What types of educational settings are most often attacked? Has this changed over time?

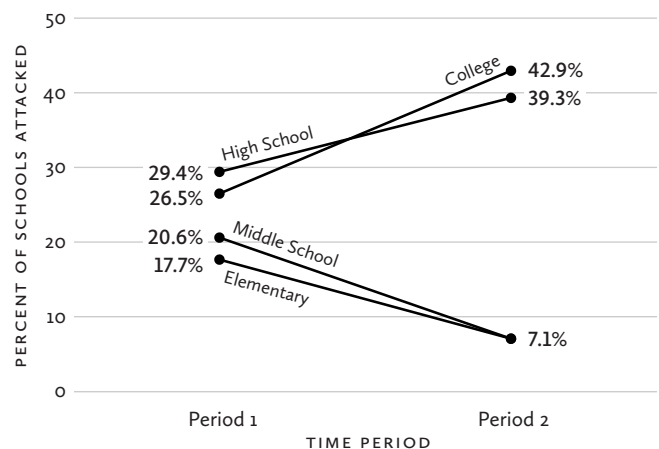
Table 2 shows the data regarding which educational settings were the sites of attacks. “Other” education settings included a cosmetology school, a computer training class, and a community center where English was taught to immigrants. The numbers (N) signify the number of attacks, not perpetrators.

Table 2: Type of Schools Attacked

School Type	N =	Percent
Elementary	8	12.9%
Middle	9	14.5%
High School	21	33.8%
College	21	33.8%
Other	3	4.8%

The type of schools that have been the sites of rampage attacks has shifted from Period 1 to Period 2, with elementary schools and middle schools seeing declines of 59.8% and 65.5% respectively, and high schools and colleges seeing increases of 33.7% and 61.8%. These results are presented in Figure 1.

Figure 1: Types of Schools Attacked, by Time Period



QUESTION 3

Who are the perpetrators in terms of age, gender, racial/ethnic identity, and immigration status, and has this changed over time? Does it vary among different groups of shooters?

AGE

As noted, the perpetrators ranged in age from 11 to 62, with an average age of 23.3. Table 3 shows how many shooters fell within each 10-year age group.

Table 3: Number of Shooters by Age Group

Age	N =	Percentage
10 to 19	34	53.1%
20 to 29	16	25.0%
30 to 39	7	10.9%
40 to 49	6	9.4%
50 to 59	0	0.0%
60 to 69	1	1.6%

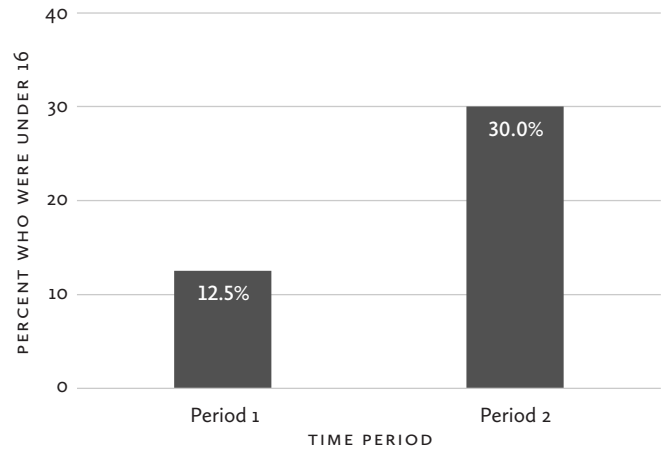
In order to further investigate the age of the perpetrators, the sample was divided into two populations: juvenile and adult. Those in the juvenile category committed their attacks while they were secondary school students. Those in the adult category committed their attacks after secondary school. Apart from two exceptions, the juvenile shooters were age 18 or younger, and the adult shooters were age 19 or older. Though much of the literature on school shooters has focused on adolescents, the data in Table 4 demonstrate the significant number of older shooters. Table 4 also indicates that the number of youths vs. adults changed over time, with Period 2 having an older population than Period 1.

Table 4: Populations by Time Period

Time Period	Juvenile	Adult	Average Age
Period 1	47.2%	52.8%	21.7
Period 2	42.9%	57.1%	25.4
Total	46.9%	53.1%	23.3

Though Table 4 notes the increase in age, there has also been a rise in the number of very young perpetrators. This shift began several years before the attack at Columbine High School. The number of perpetrators under the age of 16 has more than doubled in the last twenty years (1996 through 2015) compared to the first thirty years (1966 through 1995). These results are presented in Figure 2. This increase is from one out of eight perpetrators (12.5%) to nearly one out of three being under the age of 16 (30.0%).

Figure 2: Percent of Perpetrators Who Were Under the Age of 16, by Time Period



Shifting the analysis from percentages of very young perpetrators to the frequency of their attacks results in an even more striking finding. During the first thirty years, there were three shooters under the age of 16. Thus, on average, attacks by very young perpetrators occurred once every ten years. In the last twenty years, however, there were twelve perpetrators under the age of 16, meaning that very young perpetrators committed school shootings every 1.7 years.

Thus, there have been two contrary trends over the last fifteen to twenty years. On the one hand, the oldest perpetrator during the first thirty years was age 40, but in the last twenty years there were six perpetrators over 40. On the other hand, starting in 1996, there have been more very young perpetrators. Thus, the number of perpetrators at both ends of the spectrum has increased. Instead of being primarily a phenomenon of older adolescents and young adults, over the last twenty years the phenomenon has included more early adolescent (and even pre-adolescent) as well as middle-aged perpetrators.

GENDER

Due to the rarity of female perpetrators, and thus a very small sample size, this variable cannot be analyzed like other demographic factors. Several works have discussed concepts of masculinity and manhood in relation to school shooters, including Newman (2004) and Langman (2009b, 2015b), but female perpetrators of school shootings are so rare that they have received little attention. Langman (2015b) profiles four female perpetrators and discusses them briefly in comparison to male perpetrators, noting several similarities across genders.

RACIAL/ETHNIC/GENDER IDENTITY

Though the term “white male” is a blend of racial, ethnic, and gender variables, it is a commonly used phrase in describing the perpetrators of school shootings. Both scholarly and journalistic sources have stated that school shooters are typically white males (Bushman, et al., 2016; Gladwell, 2015). For the

purpose of this analysis, those designated as non-white perpetrators had either one or both parents who were not Caucasian (e.g., of European ancestry).

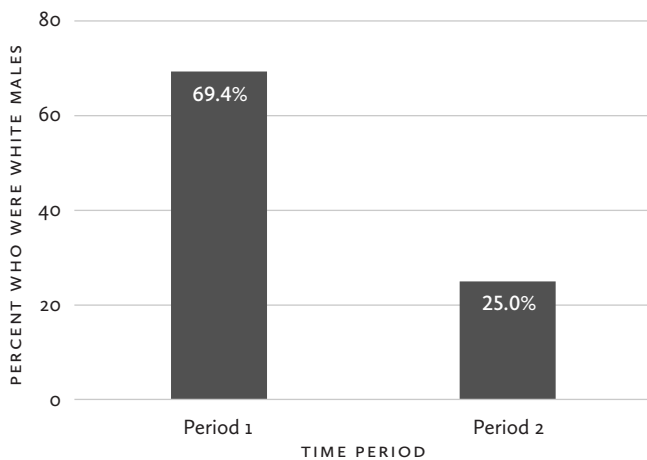
Table 5: Racial/Ethnic Identity of Shooters

Racial/Ethnic Group	Percentage	N =
Caucasian	54.7%	35
African American	17.2%	11
Asian American	12.5%	8
Latino	7.8%	5*
Native American	6.3%	4
Middle Eastern	1.6%	1

*Aaron Ybarra was part Latino but also had Asian ancestors (Latinos who had settled in the Philippines).

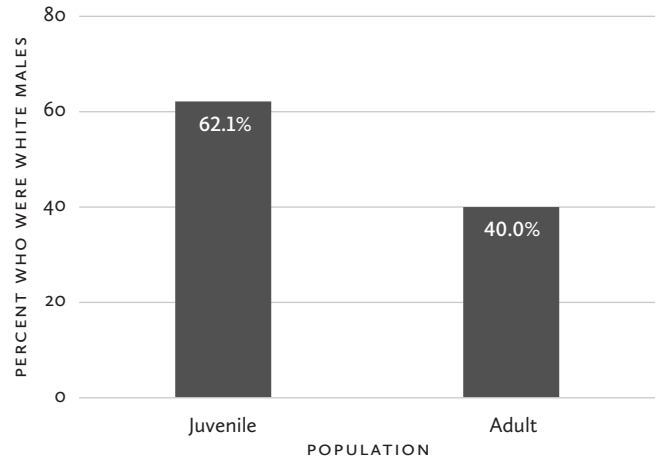
Looking at the intersection of racial/ethnic identity and gender, only 50.0% of the perpetrators were white male. There was a dramatic shift from Period 1 to Period 2, however, with white males decreasing from over two-thirds of shooters (69.4%) to one quarter (25.0%) as presented in Figure 3.

Figure 3: Percent of Perpetrators Who Were White Males, by Time Period



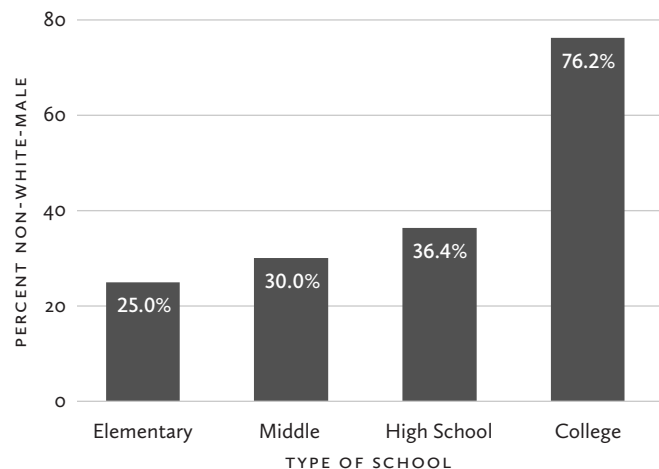
Analyzing juvenile vs. adult shooters reveals that 62.1% (18 out of 29) of juveniles were white males, compared to 40.0% (14 out of 35) of adult perpetrators.

Figure 4: Percent of Perpetrators Who Were White Males, by Population



Not only were there differences in racial/ethnic/gender identity across time periods and age groups, but also in those who attacked various levels of educational institutions (Figure 5). The percent of perpetrators who were not white males was fairly consistent across those who committed their attacks at elementary (25.0%), middle (30.0%), and high schools (36.4%), but showed a dramatic increase among those who attacked institutions of higher education (76.2%).

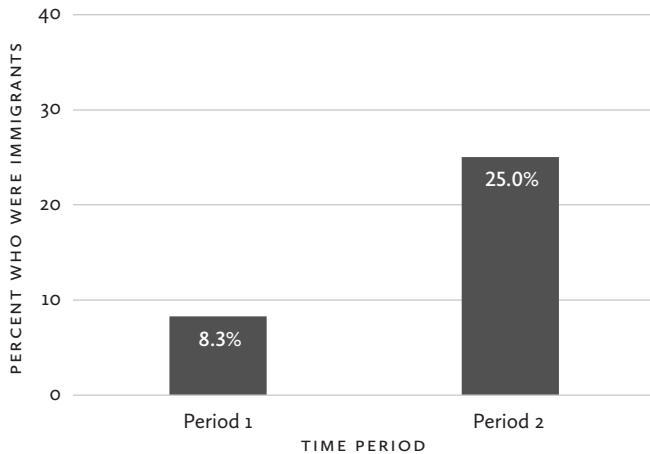
Figure 5: Percent of Perpetrators Who Were Not White Males, by Type of School Attacked



IMMIGRATION STATUS

For the purpose of this study, the term immigrant also includes the one international student in the sample. None of the shooters during the first twenty-five years was an immigrant (0 out of 17), whereas over one in five was in the second twenty-five years (10 out of 47, for 21.3%). Looking at this variable across Periods 1 and 2 shows that there were three times as many immigrant perpetrators in Period 2 (8.3% vs. 25.0%), as shown in Figure 6.

Figure 6: Percent of Perpetrators Who Were Immigrants, by Time Period



Nine out of 10 of the immigrants attacked colleges; the one who did not committed his attack at an adult learning center where immigrants were taught English. Thus, none of the immigrants attacked a primary or secondary school. Even when the perpetrators arrived in the United States as children, they did not commit their attacks until they were adults.

Leaving aside the one college attacker who was a white female, of the 20 male perpetrators who attacked colleges, 15 of them were non-white (75%); of these, 9 were immigrants (60%) and 6 were born in the United States (40%).

QUESTION 4

Has the magnitude (number of casualties) of multi-victim school shootings changed over time? Does it vary among different groups of shooters?

In tallying the data for this analysis, for the two attacks conducted by pairs of shooters (Eric Harris and Dylan Klebold, and Andrew Golden and Mitchell Johnson), it cannot be known definitively who wounded or killed which victim, particularly when both perpetrators shot the same person. An attempt has been made to divide the victims between the perpetrators as accurately as possible.

Table 6 presents data regarding changes in victim counts from Period 1 to Period 2.

Table 6: Average Number of Victims by Time Period

Time Period	Killed	Wounded	Total Victims
Period 1 (n = 36)	2.9	6.6	9.6
Period 2 (n = 28)	5.1	5.1	10.2
Total (n = 64)	3.9	6.0	9.8

Though the total victims increased slightly from Period 1 to Period 2, the more notable shift is in the ratio of the killed and wounded. In Period 1, the number of wounded was more than

twice the number killed; in Period 2, however, the number killed was equal to the number wounded. The jump in fatalities from 2.9 to 5.1 deaths is a 75.9% increase in fatalities, indicating that school shootings have become more deadly.

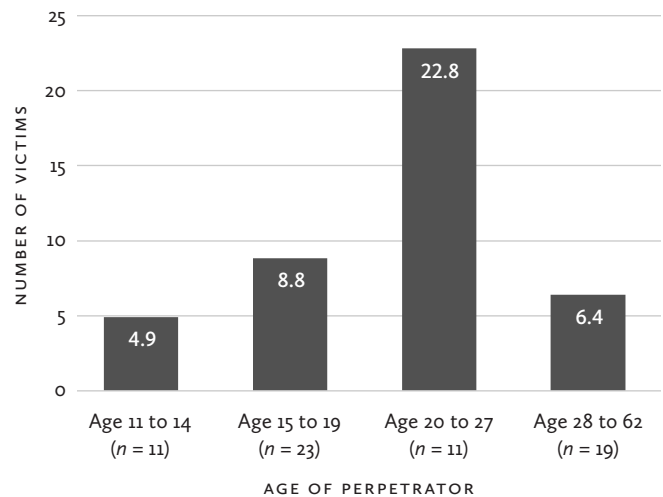
Comparing juvenile to adult perpetrators reveals that on average adults had 53.2% more victims than juveniles, and 130% more fatalities (Table 7).

Table 7: Magnitude of Attacks by Population

Population	Killed	Wounded	Total Victims
Juvenile (n = 30)	2.3	5.4	7.7
Adult (n = 34)	5.3	6.5	11.8
Total (n = 64)	3.9	6.0	9.8

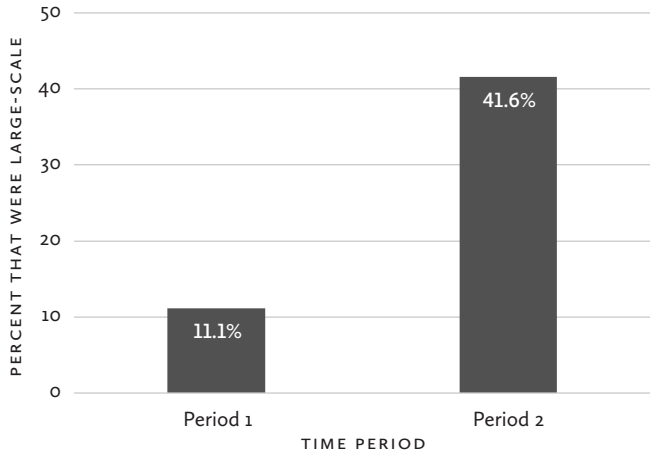
To follow up on this finding, an analysis of the relationship between perpetrator age and number of victims (regardless of time period or population) provides remarkable results. Figure 7 shows that the youngest perpetrators had the fewest victims, and that young adults (ages 20 to 27) committed the largest attacks.

Figure 7: Average Number of Victims by Age of Perpetrator



The percentage of large-scale attacks (defined as 10 or more victims) at colleges and universities increased significantly from Period 1 to Period 2. In Period 1, only one out of nine college attacks had more than 10 victims (11.1%). In Period 2, the number jumped to 5 out of 12 attacks (41.6%).

Figure 8: Percent of College Attacks That Were Large-Scale, by Time Period



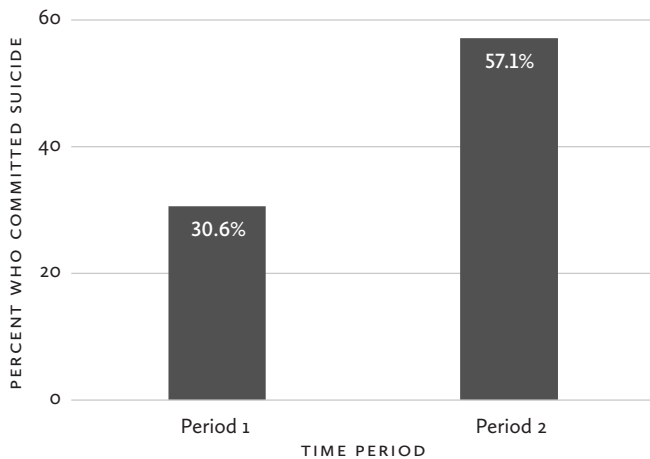
The frequency of large-scale attacks in high schools, however, has dropped significantly, from 50% (5 out of 10) in Period 1, to only 18.2% (2 out of 11) in Period 2. The sample sizes for elementary and middle school attacks across the two periods were too small to identify meaningful trends.

QUESTION 5

What is the frequency of suicide among the perpetrators and has this changed over time? Does it vary among different groups of shooters?

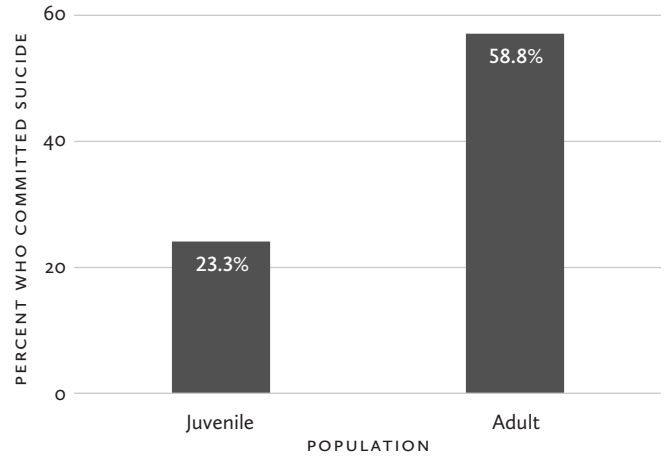
The overall suicide rate among the perpetrators was 42.2%; as noted, however, more shooters expressed suicidal intent than actually died by suicide during their attacks. An analysis by time periods reveals that the percent of suicide nearly doubled from Period 1 (30.6%) to Period 2 (57.1%), as seen in Figure 9.

Figure 9: Percent of Perpetrators Who Committed Suicide, by Time Period



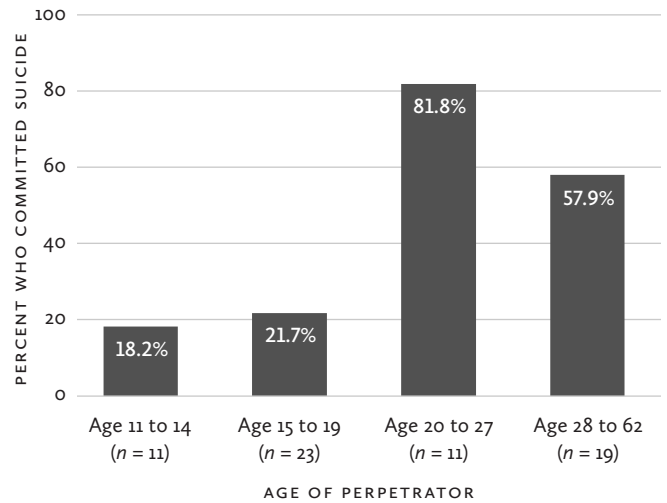
There was an even greater discrepancy in suicide rates between juvenile and adult perpetrators (Figure 10).

Figure 10: Percent of Perpetrators Who Committed Suicide, by Population



An analysis of suicide rates using the same four age groups used above in the analysis of the magnitude of attacks, reveals that young adults (ages 20 to 27) had the highest rate (81.8%). Comparing Figure 7 with Figure 11 shows that young adults were the most homicidal and the most suicidal. Figure 11 also indicates that the two groups of older perpetrators had a much higher suicide rate than the two younger groups.

Figure 11: Percent of Perpetrators Who Committed Suicide, by Age



DISCUSSION

General Comments

The results of this study shed light on several issues and misconceptions related to school shootings. First, there is a controversy regarding whether or not school shootings have increased in frequency. The results presented here suggest that the type of multi-victim attacks focused on in this study have become more

common in the last thirty years. As noted, however, this could be the result of more recent attacks being easier to identify due to the availability of news stories on the internet.

As discussed in the introduction, many previous studies have focused largely or exclusively on secondary school perpetrators. The current study reveals that school shootings are not simply a phenomenon of youth. The fact that adult perpetrators outnumbered juveniles in this sample highlights the need for research beyond school shooters in middle school and high school.

In addition, despite frequent references to the perpetrators of school shootings being virtually all white males, this sample consisted equally of white males and those who were not white males. This level of diversity among perpetrators is important to recognize because it should not be assumed that the same dynamics occur across the entire spectrum of school shooters. There may be different factors at play depending on the racial, ethnic, and gender identity of the perpetrators. This result is also important for violence prevention because if the professionals conducting threat assessments believe that school shooters are virtually always white males, they might discount a threat from potential shooters who do not fit this stereotype.

Recent Trends

This study identified numerous changes in both the demographic variables of the perpetrators and the nature of their attacks from Period 1 to Period 2. These included a shift toward older perpetrators, a decreased frequency of attacks at elementary and middle schools and an increased frequency of attacks at high schools and colleges, an increased frequency of perpetrators who were not white male, an increase in the average number of fatalities, an increase in the number of large-scale attacks in higher education, and an increased rate of suicide.

Though the attack at Columbine High School on 20 April 1999 was used as the demarcation point between the two periods, it cannot be known how much this one attack is responsible for the changes cited above. To the extent that subsequent perpetrators used Eric Harris and Dylan Klebold, the Columbine attackers, as role models, the shift toward greater magnitude of attacks as well as perpetrator suicide could be a result of imitating Columbine. Interestingly, however, the number of large-scale attacks in high schools dropped dramatically from Period 1 to Period 2.

In addition, the drastic shift in the racial/ethnic identity of the perpetrators is hard to explain. Because some subsequent shooters have viewed Columbine as an example of the downtrodden rising up against their oppressors, this may have resonated with non-white perpetrators who felt victimized by their peers, school personnel, or society at large. For example, Seung Hui Cho (Virginia Tech), referred to “we martyrs, like Eric and Dylan,” in his manifesto (Cho, 2007). Other non-white shooters, including Alvaro Castillo (Orange High School) and Aaron Ybarra (Seattle Pacific University), cited Eric Harris as

an influence. None of these, however, cited any racial/ethnic oppression as a factor in their attacks, so the validity of this as a factor remains unknown.

Another way of conceptualizing the data is to see a shift from a more narrow demographic profile of white perpetrators in their late teens to early adulthood to a broader demographic range including more older shooters (as well as more very young perpetrators) and more non-white attackers. This still does not explain the drastic shift in percentages of perpetrators who were not white males from Period 1 to Period 2 (69.4% to 25%, respectively).

Nor does it explain the result that over the last fifty years white males have been a minority among adult perpetrators (40%), but a majority of juvenile perpetrators (62.1%). The connection between age and racial/ethnic identity is elusive.

The frequent references in both scholarly sources and journalism to school shooters being primarily white males may be due to two factors. Based on the data included here, white males were the majority of school shooters during Period 1. Also, for the fifty-year period as a whole, white males constituted the majority of juvenile shooters. Some of the earlier studies focused wholly or largely on incidents that occurred during Period 1, during which most of the attackers were white males. In addition, because many studies were limited to secondary school shooters, they concluded (as did this study) that secondary school shooters were predominantly white males. Including a broader range of incidents (i.e., post-secondary school perpetrators) and a fifty-year time period allows for a more nuanced analysis of demographic trends.

The many changes noted over the last fifteen to twenty years raise the question of what factors contributed to these shifts. Grossman and DeGaetano (2014) attribute the rise in juvenile violence to the influence of video games and other violent media, but it is not clear that all the young perpetrators included in this study were immersed in media violence. Nonetheless, this may have been a factor for many shooters, and the impact of media violence on vulnerable individuals has also been cited as a factor in school shootings by Cornell (2006).

The dramatic increase in the suicide rate from Period 1 to Period 2 (30.6% to 57.1%, respectively) is difficult to explain. One factor appears to be age: older perpetrators had higher suicide rates, and Period 2 had more adult perpetrators than Period 1. Regardless of the cause of the increased suicide rate, the results highlight the frequent intersection of homicidal and suicidal ideation. Greater suicide prevention efforts in secondary schools and colleges might help prevent school shootings by more effectively identifying people at risk and providing appropriate interventions that prevent both suicide and homicide.

Higher Education

Several trends relating to institutions of higher education were revealed by this analysis. The percentage of attacks directed at colleges increased from Period 1 to Period 2 (26.5% to 42.9%),

and the percentage of large-scale attacks (10 or more victims) at colleges increased from Period 1 to Period 2 (11.1% to 41.6%). Another trend was that the majority of perpetrators of college attacks were not white males (76.2%), including a high percentage of immigrants.

The fact that none of the immigrant perpetrators who arrived in the United States as children committed attacks until adulthood, suggests that the pressures of higher education may be significant factors. Fox (2008) discussed violence in higher education by noting that many perpetrators have either been graduate students or not been traditional-aged undergraduates. He highlighted the academic pressures of graduate school as well as the life challenges of being self-supporting adults while also attending a university. He also cited the increased stress for students “who come from cultures where failure is seen as shame on the entire family.” In addition, immigrants and international students commonly deal with stresses related to acculturation, language differences, and isolation from their family and/or a supportive community. They may also come from cultures where the stigma attached to seeking mental health treatment is severe, thereby preventing them from seeking help when they are in emotional distress.

Keeping these factors in mind, colleges and universities need to examine their current programs and processes to assist immigrants and international students with their transition to the United States as well as to higher education. The same may apply to working with non-white students who were born in the United States who may face similar issues of acculturation, English as a second language, and stigma associated with seeking mental health treatment.

Pointing out the stresses faced by immigrant and other minority students, however, does not account for the increase in frequency in their attacks in higher education from Period 1 to Period 2. In addition, such considerations are not relevant for every incident. Myron May, for example, was an African American man who reportedly had an outstanding experience at Florida State University. At the age of 31, ten years after he graduated, he returned to his alma mater and for no comprehensible reason shot people on campus (Langman, 2016). Similarly, Aaron Ybarra had a mixed Latino/Asian heritage. He attacked Seattle Pacific University, an institution he had never attended and had no connection to. He had considered other venues for his attack, but chose this university as a target of convenience (Langman, 2015). Thus, caution needs to be exercised in attempting to make sense of the trends highlighted in this study.

Limitations

First, it is likely that this study did not identify every perpetrator of multi-victim school attacks as defined by the parameters stated in the introduction. Second, even if all the relevant perpetrators were identified, the results could not be generalized to all types of school shootings (gang violence, spontaneous violence that erupts at social gatherings, etc.). Finally, the ro-

bustness of the findings is limited due to the sample sizes that were available for analysis.

CONCLUSION

This study presented data on 64 multi-victim school shooters in the United States from the fifty-year period of 1966 through 2015. The results highlighted significant changes in the perpetrators and their attacks years since the attack at Columbine High School, as well as differences among various subgroups of shooters. These results demonstrate the importance of not viewing school shooters as a homogeneous population, and the need for continued research into the variations that exist among those who commit large-scale school violence. Particularly, the increase in very young perpetrators (under the age of 16) deserves study, as does the increase in middle-aged perpetrators, as well as the recent trend of more attacks by those who are not white males.

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APPENDIX: LIST OF SCHOOL SHOOTERS INCLUDED IN THE STUDY

Date	Perpetrator	School	Location
1 August 1966	Charles Whitman	University of Texas	Austin, TX
12 November 1966	Bob Smith	Rose-Mar College of Beauty	Mesa, AZ
11 November 1971	Larry Harmon	Gonzaga University	Spokane, WA
19 February 1976	Neil Liebeskind	Computer Learning Center	Los Angeles, CA
12 July 1976	Edward Allaway	University of California	Fullerton, CA
29 January 1979	Brenda Spencer	Cleveland Elementary School	San Diego, CA
6 October 1979	Mark Houston	University of South Carolina	Columbia, SC
19 March 1982	Patrick Lizotte	Valley High School	Las Vegas, NV
24 February 1984	Tyrone Mitchell	49th Street Elementary School	Los Angeles, CA
21 January 1985	James Kearbey	Goddard Junior High School	Goddard, KS
10 December 1985	Floyd Warmesley III	Portland Junior High School	Portland, CT
12 August 1986	Van Hull	New York City Technical College	Brooklyn, NY
4 December 1986	Kristofer Hans	Fergus County High School	Lewistown, MT
20 May 1988	Laurie Dann	Hubbard Woods Elementary School	Winnetka, IL
22 September 1988	Clemmie Henderson	Montefiore School	Chicago, IL
26 September 1988	James Wilson	Oakland Elementary School	Greenwood, SC
17 January 1989	Patrick Purdy	Cleveland Elementary School	Stockton, CA
1 November 1991	Gang Lu	University of Iowa	Iowa City, IA
1 May 1992	Eric Houston	Lindhurst High School	Olivehurst, CA
14 December 1992	Wayne Lo	Simon's Rock College	Great Barrington, MA
8 July 1993	Mark Duong	Weber State University	Ogden, UT
17 September 1993	Kevin Newman	Central Middle School	Sheridan, WY
16 December 1993	Steven Leith	Chelsea High School	Chelsea, MI
7 November 1994	Keith A. Ledeger	Wickliffe Middle School	Wickliffe, OH
15 November 1995	Jamie Rouse	Richland High School	Lynville, TN
2 February 1996	Barry Loukaitis	Frontier Junior High School	Moses Lake, WA
15 August 1996	Frederick Davidson	San Diego State University	San Diego, CA
19 February 1997	Evan Ramsey	Bethel High School	Bethel, AK
1 October 1997	Luke Woodham	Pearl High School	Pearl, MS
1 December 1997	Michael Carneal	Heath High School	West Paducah, KY

Date	Perpetrator	School	Location
24 March 1998	Mitchell Johnson	Westside Middle School	Jonesboro, AR
24 March 1998	Drew Golden	Westside Middle School	Jonesboro, AR
24 April 1998	Andrew Wurst	Parker Middle School	Edinboro, PA
21 May 1998	Kip Kinkel	Thurston High School	Springfield, OR
20 April 1999	Dylan Klebold	Columbine High School	Littleton, CO
20 April 1999	Eric Harris	Columbine High School	Littleton, CO
20 May 1999	T.J. Solomon	Heritage High School	Conyers, GA
6 December 1999	Seth Trickey	Fort Gibson Middle School	Fort Gibson, OK
10 March 2000	Darrell Ingram	Beach High School	Savannah, GA
5 March 2001	Andy Williams	Santana High School	Santee, CA
22 March 2001	Jason Hoffman	Granite Hills High School	El Cajon, CA
16 January 2002	Peter Odighizuwa	Appalachian School of Law	Grundy, VA
29 October 2002	Robert Flores	University of Arizona	Tucson, AZ
9 May 2003	Biswanath Halder	Case Western Reserve University	Cleveland, OH
21 March 2005	Jeffrey Weise	Red Lake High School	Red Lake, MN
30 August 2006	Alvaro Castillo	Orange High School	Hillsborough, NC
2 October 2006	Charles Roberts IV	West Nickel Mines School	Bart Township, PA
16 April 2007	Seung Hui Cho	Virginia Tech	Blacksburg, VA
10 October 2007	Asa Coon	SuccessTech Academy	Cleveland, OH
11 December 2007	Nicco Tatum	Mojave High School	Las Vegas, NV
14 February 2008	Steven Kazmierczak	Northern Illinois University	DeKalb, IL
3 April 2009	Jiverly Wong	American Civic Association	Binghamton, NY
12 February 2010	Amy Bishop	University of Alabama	Huntsville, AL
5 January 2011	Robert Butler, Jr.	Millard South High School	Omaha, NE
27 February 2012	T.J. Lane	Chardon High School	Chardon, OH
2 April 2012	One Goh	Oikos University	Oakland, CA
14 December 2012	Adam Lanza	Sandy Hook Elementary School	Newtown, CT
7 June 2013	John Zawahri	Santa Monica College	Santa Monica, CA
21 October 2013	Jose Reyes	Sparks Middle School	Sparks, NV
23 May 2014	Elliot Rodger	University of California at Santa Barbara	Isla Vista, CA
5 June 2014	Aaron Ybarra	Seattle Pacific University	Seattle, WA
24 October 2014	Jaylen Fryberg	Marysville-Pilchuck High School	Marysville, WA
20 November 2014	Myron May	Florida State University	Tallahassee, FL
1 October 2015	Chris Harper-Mercer	Umpqua Community College	Roseburg, OR