

The Relationship between Gun Control Strictness and Mass Murder in the United States: A National Study 2009-2015

It appears that the United States is in the throes of an epidemic of mass shootings. Mass murders involving firearms understandably capture public and political attention, overshadowing other types of murder that occur more frequently.¹ After a recent gun-related mass murder in the United States, the father of one victim called for “immediate action” from Congress and the President of the U.S. to pass stricter gun control laws. Additionally, recent media polls reveal that about half of Americans support enactment of stricter gun control laws, and not surprisingly, such support tends to increase as the country bares witness to the horror of these shootings via the media in the aftermath of a mass shooting.²

While all agree urgent steps need to be taken to stop mass murders, there remains a serious question as to what degree stricter gun control laws alone can actually decrease mass shootings in the U.S. Although the popular perception is that a strategy of stricter gun control would decrease mass murders, debates about the efficiency of gun control in reducing violent crime remain one of the most widely studied—and widely controversial—disputes in behavioral science literature. Common sense and several studies suggest that greater availability of guns leads to more violent crime. However, convincing empirical evidence that the answers lie in stricter gun control laws alone is actually rather sparse.^{3,4} Gary Kleck noted that findings about the efficacy of gun control to reduce violent crime is inconclusive.⁵ Similarly, John Moorhouse and Brent Wanner found that state data “provides no evidence that gun control reduces crime rates,” even three years after the control policies were implemented.⁶ Indeed, John Lott presented analyses showing that the right to carry firearms is linked to *decreased* crime.⁷ It is difficult, then, to draw conclusions about the efficiency of gun control.

Part of the reason for the varied findings on gun control certainly lies in the measurement of variables. Many studies on the efficacy of gun control include all types of gun-related deaths, including suicide and accidental shootings, non-lethal gun violence, murder, and mass killing. Yet, not all of these categories are empirically equivalent. It is certain that these kinds of gun incidences have different moderating and mediating variables that make studying gun control a challenging issue. For instance, there is little reason to believe that the control variables influencing suicide are similar to the controls for mass murder. There are qualitative differences between the different kinds of gun violence, and they should not be conflated in empirical studies on gun control. Perhaps the vast variability in findings can be at least partially attributed to the varying effects of gun control legislation on different kinds of gun violence.

Few studies have specifically teased out the link between gun control legislation and mass murder via shooting. Some of these involve investigating the link between gun control and mass killing outside of the U.S. For example, Chapman, Alpers, Agho, and Jones examined the effects of Australia's semi-automatic weapons, pump-action shot guns, and rifles ban, enacted following a mass killing that claimed thirty-five lives.⁸ The authors noted that following the legislation, no incidents of mass killing occurred in Australia. They concluded that gun control was responsible for the decline, even though they are unable to provide evidence of the causal relationship due to the lack of incidences. Using the same framework as Chapman et al., but undertaking different analyses, Jeanine Baker and Samara McPhedran concluded that gun-related suicide was the only parameter likely influenced by the Australian legislation.⁹ It should be noted that it is questionable to what degree results in Australia can be generalized to the United States or other countries, and causal inference is limited with quasi-experimental data. A 2016 study examined public mass shootings and firearms in a cross-national study of 171 countries. The

study concluded that nations with high firearm ownership are particularly susceptible to mass shootings, noting that the United States had the highest firearm ownership rates and the most mass shootings. However, India has the second highest firearm ownership rate but does not even crack the top five countries in the world for mass shootings.¹⁰

There are many other potential explanations for a decrease in gun violence as a response to increased gun control. For example, Ik-Whan Kwon and Daniel Baack indicated that socioeconomic and law enforcement factors also play an important role in the reduction of gun fatalities.¹¹

Along these lines, using cross-national data from the United Nations and reports from electronically available newspapers and police reports, Frederic Lemieux compared rates of gun deaths in nations identified as having restrictive gun control laws (such as Australia, Norway, Denmark, and Switzerland) and nations identified as having permissive firearm ownership (vis-à-vis handling, storage, and sales oversight), such as the United States.¹² Despite differences in gun deaths between nations, Lemieux found only a weak, negative relationship between gun control and death by firearms. In a small section on mass murder, Lemieux noted that while the United States surpassed all other industrial nations in incidences of mass shootings, rates of victimization tend to be lower (7.01 victims in the United States versus a cumulative average of 10.6 casualties for comparison nations.) Adam Lankford's study suggests the lower American casualty rate per incident is due to routine police training on how to respond to mass shootings.

As already noted, comparing the effects of gun control legislation across nations is a dubious proposition due to a myriad of cultural differences. With so many variables affecting rates of violence, it is difficult—if not impossible—to disentangle all of them sufficiently to attribute observed effects to gun control. Differences in rates of poverty, population density, and

law enforcement could all influence rates of gun violence. Indeed, a growing body of research on mass murder within the United States has focused largely on understanding precipitating factors that lead to mass killings; or to the characteristics of the perpetrator.¹³ For instance, Hempel, Meloy, and Richards studied a nonrandom sample of thirty adults accused of mass murder and created a general psychological profile of the “typical” offender.¹⁴ Roland Holmes and Stephen Holmes attempt to classify mass murders into various types.¹⁵ James Fox and Jack Levin provide a solid review and analyses of the demographics and typical characteristics of a mass murderer.¹⁶ These studies are informative, but do not aim to provide empirical evidence as to whether gun control is associated with a reduction in mass murder.

Furthermore, while some studies cast doubt on the idea that gun control will decrease the number of incidences of mass murder, it might be possible to use gun legislation to reduce the numbers of *victims* of mass killings. Considerable social policy has recently centered on the idea of limiting ammunition as a means to reduce the number of victims during mass killing incidents.¹⁷ However, little if any research has been done on the efficacy of this approach in reducing either number of incidences of gun violence or number of victims. This should certainly be an immediate focus for social scientists.

It is challenging to understand the fundamentals of an issue when researchers do not agree on how to define a construct. Most empirical research examining mass murder includes the killing of four or more victims in public or private locations and is not limited to gun crimes.¹⁸ Some studies include gang-related violence, while others do not. There also appears to be debate as to what constitutes a mass murder perpetrated by a firearm. Some reports have curiously excluded cases where shootings have taken place in private homes.¹⁹ Other reports

exclude cases in which all the victims were related. As Fox and Levin pointedly noted, such cases still result in carnage.²⁰

Thus, this study assesses whether there is a relationship between the strictness of gun control laws and number of mass murder incidents per state. It analyzes the relationship between gun control strictness and incidences of mass murder; as well as rates of victimization from mass murder incidences in the United States.

Methods

The data for this study originates from a report on mass murders committed from 2009 to 2015 in the U.S. presented by *USA Today*.²¹ This report featured information about the number of mass murders per state, the number of victims per incidence, and the type of weapons utilized. *USA Today* employed the Federal Bureau of Investigation's definition of mass murder, which is the killing of four or more individuals, sometimes simultaneously, without a "cooling-off" period.²² The newspaper collected their data from FBI reports and other reputable media sources. Each source was verified through reputable media (e.g., local newspapers, television network websites ABC, CBS, NBC, or FOX) to determine its accuracy. This collection method is in line with other studies that have employed the mass media method to gather data about crimes and criminal behavior.²³

One incident presented by *USA Today* matched the criteria for a spree killing more closely as opposed to mass murder.²⁴ With one incident of gang fighting with multiple perpetrators and victims, it was impossible to delineate the number of victims per shooter. Hence this study omitted these two cases from the analyses. The FBI defines mass murder as four or more killings in the same location or area without a cooling-off period; while spree killings are defined as killings that occur in two or more locations. When *USA Today* noted more than one

type of weapon used in a mass murder, the original, verifiable media articles were consulted to determine the primary weapon used in the killings.²⁵

The strictness of gun control laws in each state received a rating, allowing it to be indexed. Similarly to other studies examining the relationship between gun control and safety, this one consulted the *2013 State Scorecard*, a report from the Law Center to Prevent Gun Violence and the Brady Campaign to Prevent Gun Violence.²⁶ The *2013 State Scorecard* provides an explanation of evaluation criteria and assesses each state a numerical score, ranging from 0 (least) to 100 (most), in its evaluation of each state's gun control strictness. The Law Center to Prevent Gun Violence and the Brady Campaign to Prevent Gun Violence used over thirty evaluation criteria, including background-check factors for gun purchasers (e.g. mental health factors, assessments of domestic violence, and other criminal history). This study used the *2013 State Scorecard* because latter editions did not provide ratio scores. Consulting the *2009 State Scorecard* highlighted any changes in gun control strictness over time.²⁷

As a validity check of the *2013 State Scorecard*, this study consulted with a regional gun store that has a multimillion dollar online retail sales department. This store is a leading Pennsylvania gun broker and sells and ships weapons to residents of all states. (Such sales are not direct to the customer; rather, the weapon is shipped to a licensed gun dealer in the purchaser's state of residence. The dealer processes background checks and necessary paperwork.) The top internet sales employee at the time of the study, while blind to the study's hypothesis, responded to the question, "How restrictive are the gun sale laws in each state?" The employee provided ratings of each state on a 10-point scale, with 1=*Very unrestrictive*, and 10=*Very restrictive*. The employee received no remuneration for providing us these ratings.

There was a strong, positive correlation between *Scorecard* scores and the independent ratings, $r(48) = .83, p = .000$.

Although there were three documented mass murders in Washington, D.C. during the examined time span, the *2013 State Scorecard* did not provide a score for D.C. Therefore, these were not incorporated into the present analysis.²⁸ The final sample consisted of 190 incidents of mass murder that took place in the U.S. from 2009 to 2015. As population is a salient predictor of violent crime, this study included the 2014 state population estimates from the US Census Bureau's website.²⁹

The issues of gun control and mass murder are politically controversial. Hence, it was important to include the political climate of each state as assessed by voting in the 2012 presidential election with respect to gun control law strictness.³⁰ This was done by comparing mass murder trends in "red states," whose majority of voters supported the Republican candidate for president, with "blue states," whose majority of voters supported the Democratic candidate for president.³¹

Results

Of 190 cases of mass murder committed in the U.S. from 2009 to 2015, 149 (78.4 percent) were committed with a gun as a primary weapon (GPW). These acts claimed the lives of 753 people (the perpetrator was not counted if s/he died as a result of the incident). The 41 (21.6 percent) non-GPW claimed the lives of 188 people.

Table 1

Mass Murders per year; Total and with Gun as Primary Weapon

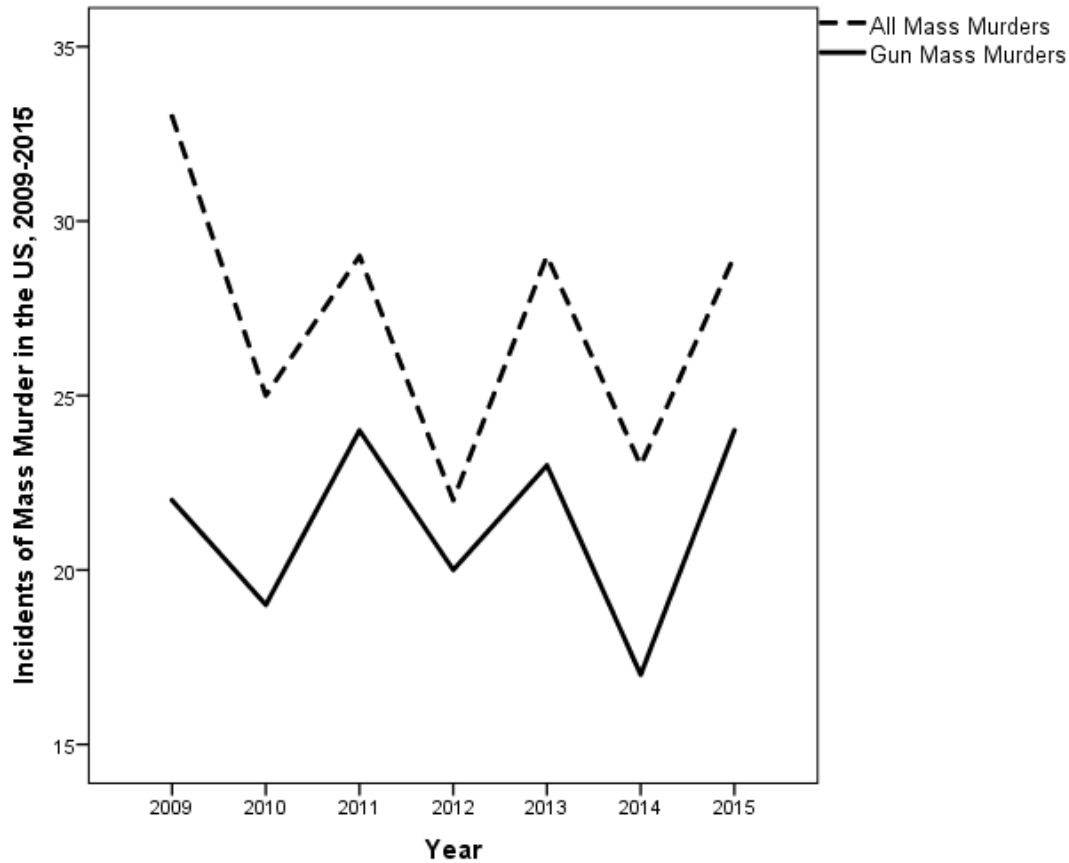
<i>Year</i>	Total Number of Mass Murder Incidents	Mass Murders with Gun(s) as the Primary Weapon (GPW)	Mass Murders without Identified GPW
<i>2009</i>	33	22	11
<i>2010</i>	25	19	6
<i>2011</i>	29	24	5
<i>2012</i>	22	20	2
<i>2013</i>	29	23	6
<i>2014</i>	23	17	6
<i>2015</i>	29	24	5
Total	190	149	41

There was a strong positive correlation between state population and the number of mass murders (any type) committed therein, $r(48) = .87, p = .000$. There was also a strong positive correlation between state population and the number of GPW mass murder incidents, $r(48) = .83, p = .000$, and a moderate, positive correlation between state population and non GPW mass murder incidents, $r(48) = .66, p = .000$. Moreover, states with higher populations have stricter gun control, as there was a significant positive correlation between state population and gun control strictness (score on the *2013 State Scorecard*), $r(48) = .379, p = .007$. Thus this study controlled for population in subsequent analyses.

Using partial correlations to control for population, gun control strictness was negatively moderately related to the number of GPW mass murders incidents in a given state, $r(47) = -.423$, $p = .002$. It was unrelated to the number of non-GPW mass murders, $r(47) = .149$, $p = .308$.

From 2009 to 2013, according to *Scorecard* standards, forty-eight states increased the strictness of their gun control laws to some extent. The exceptions were Wyoming and North Carolina, which decreased strictness. However, when considering total incidents of mass murder across the United States, there has been no statistical increase or decrease in either the number of GPW mass murders or the total number of mass murders from 2009 to 2015. Analyses yielded no linear model fit ($p > .05$). Figure 1 depicts these data. Analyses also yielded no inverse, quadratic, or cubic model fit ($p > .05$) for all mass murders or GPW mass murders, and no linear, inverse, quadratic, or cubic model fit for non GPW mass murders over the time period ($p > .05$).

Figure 1. Mass Murder in the US from 2009 to 2015



Although there was a numerical difference, there was no statistical difference in incidents of GPW mass murder between states that composed the ten most strict (California, Connecticut, New Jersey, Maryland, New York, Massachusetts, Hawaii, Illinois, Rhode Island, and Delaware, respectively) ($M = 3.3$, $SD = 4.74$), and states that composed the ten least strict gun control laws (Arizona, Arkansas, Wyoming, South Dakota, Kansas/Mississippi/Vermont [tied], Kentucky, Montana, Louisiana/Utah [tied], respectively) ($M = 1.91$, $SD = 2.07$), $t(17) = .886$, $p = .386$. There was no statistical difference, but the states with the ten *strictest* gun laws ($M = 2.50$, $SD = .791$) had more than four times as many non-GPW mass murders as the states with the ten least strict gun laws ($M = .364$, $SD = .505$), $t(19) = 1.61$, $p = .125$.

Controlling for population, there was a negative relationship between Brady scores and the number of victims in GPW mass murders, $r(47) = -.257, p = .037$. There was no relationship between Brady scores and the number of non-GPW mass murder victims, $r(47) = .145, p = .320$.

Based on the 2012 presidential election results,³² we found that states won by the Democratic candidate (“blue” states; more liberal ideology) had much stricter gun control legislation ($M = 26.31, SD = 5.16$) than did states won by the Republican candidate (“red” states; more conservative ideology) ($M = 3.70, SD = .76$), $t(48) = 5.34, p = .000, d = 6.13$. However, blue states ($M = 3.08, SD = 2.98$) did not have fewer incidents of GPW mass murder than red states ($M = 2.88, SD = .73$), $t(48) = .208, p = .836$, nor did blue states ($M = 4.00, SD = 4.93$) have fewer incidents of mass murder overall compared to red states ($M = 3.58, SD = 3.3$), $t(48) = .348, p = .729$. States that had the ten strictest gun control ratings were all blue states, while states with the ten least strict gun control ratings were all red states, with the notable exception of Vermont.

Mental Illness

Although not approached *a priori*, upon finding that gun control strictness was not strongly related to incidents of mass murders per state, this study considered whether or not mental illness may contribute to the phenomenon. Studies have documented mental illness in homicides,³³ but interestingly, relatively few scientific reports focus on mental illness in mass murderers. Some authors, such as Stone, Fox and Levin, and Lieberman, acknowledge that many mass murderers likely suffer from mental illness, such as personality disorders or schizophrenia.³⁴ Lankford underscored that mental illness may not be the sole cause of mass shootings, but it can exacerbate the perpetrator’s family, social, work, or school problems.³⁵ Of

note, however, such reports do tend to focus on perpetrators of mass shootings and not on perpetrators of other types of mass murder.

Mental health information for the perpetrators in this study was not available, thus the aim was to analyze the statistical relationship between mental illness prevalence per state and mass murders. The best source to determine mental illness prevalence was the most recent data from the Substance Abuse and Mental Health Services Administration (SAMHSA)³⁶ that estimated the percentage of persons from each state experiencing serious mental illness (SMI) in 2011 and 2012, overlapping with the time period of this analyses.

Using hierarchical multiple regression, this study considered the ability of Brady score of gun law strictness and serious mental illness (SMI) to predict GPW mass murder incidents per state, controlling for population. Initial analyses showed no violations of the assumptions of multicollinearity, normality, and homoscedasticity.

At Step 1, population accounted for 68.7 percent of the variance in GPW mass murders, $F(1, 48) = 105.43, p < .001$. Adding Brady scores and SMI at Step 2 explained an additional 5.8 percent of the variance in GPW mass murders, R^2 change = .058, $F(3, 46) = 44.85, p < .001$. Brady scores ($\beta = -.221, p = .029$) were a significant predictor of GPW mass murder, accounting for 2.8 percent of the variance ($R_{\text{part}} = -.167$), but SMI was not a significant predictor ($\beta = .059, p = .540; R_{\text{part}} = .046$).

The next step was to repeat the analysis for non-GPW mass murders. Population accounted for 44.1 percent of the variance in non GPW mass murders, $F(1, 48) = 37.80, p = .000$. Adding Brady scores and SMI to the model did not create a significant F change (2, 46) = .641, $p = .531$. Neither Brady scores ($\beta = .160, p = .270$) or SMI ($\beta = .069, p = .628$) explained significant variance in non-GPW mass murders.

Of note, there was a moderate, negative correlation between Brady scores and SMI, $r(48) = -.63, p < .001$. That is, states with stricter gun control laws had *less* serious mental health issues in their populations.

Discussion

With such pointed statements as, “The good news is that not all [US] states are gun-friendly places,”³⁷ The Brady Campaign has a clear anti-gun agenda but does appear to have a transparent, valid method of deriving gun-control strictness scores. The agenda does not necessarily invalidate the method of data collection. In this case, a representative of a store that sells guns to customers across the U.S., a clearly pro-gun stance, provided ratings of gun control strictness that were very similar to those derived by The Brady Campaign. Therefore this study incorporated the Campaign’s *Scorecard* ratings into the analysis. Nonetheless, in further pursuit of the relationship between legislation and firearm-related murder and other violence, organizations without any gun-related agenda may wish to undertake independent examinations of how gun-related laws impact mass murder.

Although each event is horrific and impactful, our data show that between 2009 and 2015, mass murders were arguably uncommon in the U.S. as compared to other violent crimes. In the seven-year time period under investigation, at 2.26 incidents occurring every month, with 1.77 of those being gun as a primary weapon (GPW) mass murders. The US Centers for Disease Control’s (CDC’s)³⁸ most recent data on homicide reported that 16,121 homicides occurred in 2013 in the US, or 1343.42 per month. Data gathered indicated that there were 125 victims of mass murder in the US in 2013. Stated another way, 0.8 percent of all homicide victims in 2013 were victims of a mass killing. The CDC also reported that in 2013 there were 11,208 victims of firearm homicides.³⁹ Data we gathered indicated that there were 100 victims of GPW mass

murders in the US in 2013, representing 0.9 percent of firearm homicide victims. Although perhaps morally disagreeable, this is why more resources appear to be devoted to trying to understand and prevent the other 99 percent of GPW murders and other crimes. Nonetheless, we stress that even one mass murder is too many, and we urge fellow researchers to continue their investigations of understanding and prevention, albeit a hauntingly difficult task. Merely defining “prevention,” e.g., restriction of sales, banning certain types of firearms, seems daunting. These analyses reveals that in the time period from 2009 to 2015, mass murders were nearly four times as likely to be committed using a gun as a primary weapon, and GPW mass murders resulted in four times as many victims as non-GPW mass murders. However, about one out of five mass murders documented herein were committed with a primary means *other* than a gun. Thus, although a gun is the most commonly used instrument of the mass murderer, s/he finds other ways to perpetrate the massacre, including documented incidences of stabbing, beating, strangling, burning, running someone over with a car, and pushing a carload of people in front of a moving train.

Unsurprisingly, population was the strongest predictor of mass murder incidents per state. This is consistent with studies in criminal justice that show population as a significant predictor variable in violent crime. In its most basic form, a higher population provides more opportunities for crimes to occur, as well as a larger pool of victims from which to draw.⁴⁰

Although gun control strictness in the US has largely increased over time,⁴¹ there has been no change in the general trend of mass murder in the US overall or in GPW mass murders in the time period this paper investigated. However, it must be noted that, controlling for population, there is a negative association between gun control strictness in a given state and that state’s number of incidents of mass murder and that state’s number of victims of mass murder.

That is, as gun control increases, GPW mass murder incidents decrease, and there are fewer victims. More research needs to be conducted to tease out mediators or moderators of this relationship. Moreover, when considering both population and mental illness as other factors, gun control strictness accounted only for about 3 percent of the variation in GPW mass murders. This weak relationship mirrors Lemieux's findings.⁴² The limitations of correlational analysis apply, but a non-zero correlation warrants a more in-depth look when attempting to understand the nature of the relationship. To cure the problem of gun violence, it is up to social scientists and law makers to derive the salient factors that contribute to this issue, and work together at prevention.

This study's finding that states with stricter gun control have fewer incidences of mass murder is not problematic or particularly novel. The more controversial finding that states with stricter gun control have significantly higher numbers of victims can be disconcerting. However, it should be noted that these findings, if replicated, offer a valuable clue about the direction gun control legislation might take. It implies that both incidences of violence and number of victims should be considered in measurements of gun control effectiveness.

Proponents of gun control legislation should wish not only to continue efforts to reduce incidences of mass murder, but also to reduce the number of victims. Several simple and practical steps could be considered that are relatively uncontroversial, and which likely do not infringe upon basic rights. For example, a ban on gun enhancers such as bump stocks, or a ban on the size of ammunition magazines might be effective in reducing victimization in mass murder incidences.

Although not an examination of mass murder per se, at least one study analyzed factors associated with school shootings in the United States. Bindu Kalesan and colleagues collected

data on 154 school shootings that took place from January 2013 to December 2015 (about once per week).⁴⁴ They found that such shootings were significantly less likely to happen in states that require background checks. Although this correlational study cannot substantiate causation, it should serve as a springboard to further research geared at understanding and prevention.

The US Republican Party makes its pro-gun stance known,⁴⁴ and the US Democratic Party strives to enact “reasonable regulation...so that guns do not fall into the hands of those irresponsible, law-breaking few.”⁴⁵ Be that as it may, state political climate (Democrat or Republican voting in the 2012 presidential election) did not predict mass murder.⁴⁶ These two philosophies are not mutually exclusive. Lawmakers should strive to invest energy and resources into behavioral research projects that can help better identify the cluster of personality and environmental variables that can predispose an individual to commit such heinous acts.

Although this paper did not address the topic *a priori*, it did seek to determine if mental illness prevalence was related to mass murder incidents per state. There was no relationship between serious mental illness in GPW or non-GPW mass murders. There is mixed evidence that crime and mental illness are inherently connected. J.K. Peterson and colleagues demonstrated that most crimes are not motivated by mental illness.⁴⁷ Peterson stressed that “the vast majority of people with mental illness are not violent, not criminal, and not dangerous.”⁴⁸ However, mental illness may still play a role. As an example, Marissa Harrison and colleagues showed that about 40 percent of female serial killers experienced some form of mental illness.⁴⁹ Even if mental illness is not a definitive precursor for mass murder, this does not exclude psychological considerations from the picture. David Matsumoto, Hyi Sung Hwang, and Mark Frank, writing for the FBI, urged researchers, law enforcement personnel, and policymakers to concentrate on how emotions, functioning to motivate behavior, can facilitate anger.⁵⁰ Their data

showed that increases in contempt, disgust, and anger immediately precede aggressive acts. They noted that anger and outrage, superiority-based contempt, and disgust-motivated elimination can contribute to violence. Certainly, more research needs to be conducted on how emotions, appraisals, and other cognitions can facilitate violent behavior. Furthermore, the fact that most individuals with mental illness do not commit crimes does not necessarily mean that most mass murders were *not* committed by mentally ill perpetrators.⁵¹ That relationship must be teased out by future researchers. This paper acknowledges that a limitation of this approach is that it had incomplete data with respect to the mental health of each perpetrator who committed the crimes noted in the present study. However important this limitation is, it lies beyond the immediate scope of the paper.

What other factors may contribute to mass murder? Fox and Levin pointed to strain, social learning, opportunities for victimization, and control and attachment to social ties and to the community as further avenues to explore in our attempts to understand mass murder.⁵³ It seems, then, that we have a long way to go in investigating mass murder, and that the best approach is to focus on identifying, categorizing, preventing, in addition to reporting potential trouble before it manifests. Of course, it is very difficult to predict when someone will exhibit extreme violence, such as in the case of mass murder.⁵⁴ Although it is far easier said than done, perhaps the phenomenon of mass murder necessitates a joint effort by mental health practitioners, law enforcement, employers, friends, and family to recognize warning signs.

Previous research has identified various typologies of mass murderers: the *pseudocommando*, preoccupied with firearms and wartime paraphernalia and planning the rampage to extract revenge in society; the *family annihilator*, depressed paranoid, and killing his family out of revenge or jealousy; and the *set-and-run* or *hit-and-run* killer, those who typically

set fires or use explosives to kill, planning potential escape routes.⁵⁵ Holmes and Holmes argued for another typology, the *disgruntled employee*, who sets out to kill individuals or groups of people at his current or former place of business, attempting to right some injustice of which he felt he was a victim.⁵⁶ Moreover, those who commit mass murders tend to externalize the blame. They believe they are being persecuted and blame family, friends, employers, coworkers, teachers, etc. for their current state.⁵⁷ They also tend to be loners.⁵⁸ It is therefore imperative to conduct research and provide education in recognizing warning signs. Although not a perfect predictor, this may aid in reducing gun violence.

There are limitations to the present analysis. The researchers conducted mass murder research in the past, and found *USA Today's* report of mass murders from 2009 to 2015 to be the most accurate, comprehensive source of information to date, surpassing the number of cases that even the FBI documented.⁵⁹ Each case was researched to verify that it did meet the criteria for a mass murder. Nonetheless, their reports could have omitted instances. Further, data from 2009 to 2015 clearly may not be representative of the mass murders in the U.S. that come before this time period. It would be interesting to compare these results with those from early mass murders to determine any increases, decreases, or differences in relationships among variables. Additionally, these data may not be comprehensive of mass murders that occur outside the U.S. While this study endeavored to utilize the most recent data on variables (e.g., population, mental health), it did not include data for the 2009 to 2015 period *in toto*. Results should be interpreted with these caveats in mind.

It is also prudent for future research to consider an analysis of District of Columbia, which was the site of Washington Navy Yard shooting in 2013 that claimed twelve victims, as

well as other documented mass murder tragedies. The most recent reports uncovered did not yet provide an analysis of D.C.'s gun control laws.

This study also stresses that with mass murder being an uncommon occurrence, it is possible that the associations it sought to document (gun control, mental illness) do indeed exist but could not be statistically elucidated by such a small sample size. As an example, the data showed that the ten states that have strictest gun control had almost twice as many mass murder incidents than did the ten states that have the least strict gun control. This was not a statistical difference; however, this may be a meaningful piece of information that warrants further exploration. Future research may be able to address sample size issues by examining instances of mass murder that occurred prior to or after our time frame.

It should be noted that the author is not advocating against or for gun control. As a social scientist, I wish to bring awareness to the problem so that other social scientists, criminal justice experts, and policy makers can concentrate efforts on developing prevention strategies that will work. There are likely a multitude of psychological factors that are associated with the decision to commit mass murder,⁶⁰ but as James Fox underscored, it may prove exceedingly difficult to be able to identify mass murderers before their massacres are committed.⁶¹ Nonetheless, society cannot and should not stop trying to solve this puzzle, and in our search for truth, we must maintain objectivity and proceed empirically so as to avoid going down incorrect paths. It is time to stop politicking and let the data speak for the victims now, informing our policies and guiding us in a unified pursuit of the truth.

ENDNOTES

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