Am J Crim Justice. 2021 Sep 30;48(1):21–50. doi: 10.1007/s12103-021-09644-7

Firearm Ownership, Defensive Gun Usage, and Support for Gun Control: Does Knowledge Matter?

Nathan E Kruis [1,✉], Richard L Wentling [2], Tyler S Frye [1], Nicholas J Rowland [3]

Author information Article notes Copyright and License information

PMCID: PMC8482364 PMID: 34608367

Abstract

Recent incidents of gun violence have raised questions about public access to “military-style” firearms and the need for more-restrictive forms of gun control. Proponents of more-restrictive forms of gun regulation argue that such measures will help combat the disproportionately high rates of gun crime in the United States. Opponents believe that such measures infringe upon constitutional rights and hinder law-abiding citizens' abilities to adequately defend themselves. This project explores the characteristics of gun owners living in Pennsylvania and public perceptions of three different categories of gun control. Results indicate that most gun owners have received some form of training and take appropriate safety precautions with their firearms. Further, 1 in 4 gun owners reported using their firearm in self-defense at some point in their life. Regarding gun control, most participants favored strategies intended to keep guns away from dangerous and “at risk” people, such as required background checks for all types of gun purchases, mental health screenings, and mandatory gun education. However, most participants opposed complete firearm bans. Among those who are the least supportive of such polices are those who are the most knowledgeable about gun crime, gun legislation, and gun functioning. Policy implications are discussed within.

Supplementary Information

The online version contains supplementary material available at 10.1007/s12103-021-09644-7.

Keywords: Gun control, Defensive gun usage, Perceptions of firearms

Introduction

Gun reform was a key policy issue of the 2020 presidential general election. President Biden and Democratic leaders have advocated for the enactment of "common sense" gun reform efforts, such as assault weapon bans, universal background checks, and increased resources to enforce current gun laws (Lucey, 2021). They believe that such reforms will help reduce the disproportionately high rates of gun crime in America. As such, leading Democrats are expected to push to change gun laws in the coming years (Newburger, 2021; Phillips, 2021). However, while data suggests that many Republicans are generally supportive of gun reform efforts intended to keep guns away from dangerous and "at risk" people (Cook et al., 2011; Oliphant, 2017), many Republican leaders view the comprehensive reforms proposed by Democrats as arbitrary, infringing on constitutionally protected rights, and hindering American citizens' abilities to adequately protect themselves, their families, and their properties. They believe that comprehensive legislation proposed by the Biden administration will only remove guns from the hands of law-abiding citizens and do little to combat gun crime. As such, legislators in many Republican-led jurisdictions have begun passing more-permissive gun policies aimed at limiting the scope of federal ("Democratic" enacted policies) gun control measures at the state level, such as pushing for "Constitutional Carry" laws, "Anti-red flag" legislation and creating "2nd Amendment Sanctuary" cities and states (Balemert, 2021; Friend, 2021).

The debate is not exclusively political, though. There is also a rift in support for gun control amongst scholars, with some favoring more-restrictive forms of gun control and others favoring less-restrictive forms of gun regulation (Morral et al., 2018). The legality and utility of gun regulation has promoted much discussion amongst academics (see Braga et al., 2021; Kleck et al., 2016; Winkler, 2018). Public support for gun control is also mixed and has varied across time, although current estimates suggest that a slight majority favor more-restrictive forms of gun control, but do not favor complete firearm bans (Gallup, 2020; Parker et al., 2017).

Prior research has attempted to examine correlates of attitudes toward gun polices. Generally, this work has found that those who are the least supportive of more-restrictive forms of gun regulation are those who identify as politically conservative (Kruis et al., 2020), whites (Merino, 2018), males (O'Brien et al., 2013), and gun owners (Merino, 2018), as well as those with greater familiarity with firearms (Rosen, 2000). A recent article published in the *American Journal of Criminal Justice* shifted this discussion to the relationship between gun knowledge and support for restrictive forms of gun control (see Kruis et al., 2020). In that work, the researchers found an inverse relationship between

gun knowledge (i.e., broad "understanding" of gun policies, legislation, and crime) and support for stricter forms of gun control amongst college students. Findings indicated that students who knew more about guns and gun-related matters, reported being less supportive of more-restrictive forms of gun control than students who lacked such knowledge. Unfortunately, methodological limitations (e.g., cross-sectional research design, convenience sampling, student participants, etc.) precluded the authors from drawing firm conclusions about the relationship between gun knowledge and gun functioning. The current project seeks to extend this line of research by exploring the relationship between three types of gun knowledge (i.e., knowledge of gun crime, knowledge of gun legislation, and knowledge of gun functioning) and three different measures of gun control (i.e., general gun control, support for policies that reduce overall gun ownership, support for polices intended to keep guns away from dangerous and "at risk" people). The current project also extends Kruis et al.'s (2020) findings related to student gun owners to members of the general public, by exploring the demographic characteristics, training experiences, safety precautions, and defensive gun usage reported by gun owners obtained from a representative sample of Pennsylvania Residents ($N = 522$). In achieving these goals, the current study seeks to provide academics and policymakers alike with important information needed to be considered before making gun reforms.

Literature Review

Gun Violence

The United States has disproportionately high rates of gun violence for a developed country (Grinshteyn & Hemenway, 2019; Naghavi et al., 2018). The U.S. homicide rate is estimated to be about seven times higher than other high-income countries, which researchers suggest is primarily driven by a gun homicide rate that is about 25 times higher (Grinshteyn & Hemenway, 2019). In 2019 alone, there were approximately 39,707 firearm-related deaths in the United States, equating to a rate of about 12.1 per 100,000 persons (Centers for Disease Control and Prevention [CDC], 2020) —which is about three times the rate of America's northern neighbor (i.e., Canada, 4.1 per 100,000; Department of Justice, Government of Canada, n.d.). Among these firearm-related deaths, 23,941 were suicides and 14,414 were homicides (CDC, 2020). Guns, particularly handguns, are used to commit many violent crimes and most murders in the United States (National Institute of Justice, 2019). In total, guns were used to help commit more than 121,000 violent crimes in 2019 (Federal Bureau of Investigation [FBI], n.d.). According to data collected for the National Crime Victimization Survey (NCVS), guns were used in more than one in three aggravated assaults and about one in five robbery victimizations reported by Americans in 2019, but fewer than 1 in 100 rape and sexual assault victimizations (Bureau of Justice Statistics, 2020). In this regard, while guns are used to help commit many crimes, it would be an oversight to ignore that most violent victimizations in the United States do not involve guns (Braga et al., 2021). Further, whenever a gun is used during the commission of a violent crime it usually is not fired. In fact, when a gun is used in a crime it is

predominately used as an instrument to gain victim compliance. Data suggest that only about one in four victims of nonfatal gun crimes suffer a gunshot wound (Planty & Truman, 2013) and overall injury rates for victims of gun crimes tend to be lower than rates for victims of crimes in which other weapons are used (Cook, 1980; Cook et al., 2011). However, whenever guns are used offenders are more likely to complete the criminal act (Cook et al., 2011; Libby & Corzine, 2007; Tillyer & Tillyer, 2014), and whenever they are fired, victim injuries are more likely to be lethal (Cook, 2018; Cook et al., 2011).

The Great American Gun Debate

Given high rates of gun crime, many progressives have demanded changes be made to American gun legislation. In a review of the extant literature on firearm instrumentality, Braga et al. (2021) suggest that there are two sides in the great American gun debate. On the one side of the debate are those who favor more-permissive forms of gun regulation. These advocates tend to conform to the adage endorsed by the National Rifle Association (NRA) "guns don't kill people, people kill people" (Braga et al., 2021; Henigan, 2016; Shammas, 2019). This group believes that more-restrictive gun control will do little to reduce crime or to save lives (Kleck, 1997; Kleck et al., 2016; Wolfgang, 1958). On the other side of the debate are proponents of more-restrictive forms of gun regulation, or those who believe that "guns do kill people" (Braga et al., 2021, p. 148). These advocates suggest that reducing firearm availability, especially to who they consider to be dangerous or "at risk" individuals (i.e., felons, the "mentally unstable,"[1] etc.) will help reduce violent gun crimes and suicides, and ultimately, save lives. In Braga et al.'s (2021) synopsis of propositions introduced by the two sides, the researchers argue that the key distinction between proponents and opponents of stricter forms of gun control relates to the instrumentality of weapons. Specifically, they write "The 'people kill people' perspective further suggests that gun control is futile in reducing homicides because determined killers will simply find another way. If guns are not available, assailants will substitute knives, blunt instruments, or other means" (p. 148). Similar sentiments are found within the general public as an increasing number of Americans have purchased firearms, specifically during the Covid-19 pandemic, citing self-defense as a primary driver of ownership (Gallup, 2020; Schaeffer, 2021). However, proponents of more-restrictive means of gun control assume that even if assailants choose to use other means (i.e., knife, blunt instrument) to carry out their attacks, such attacks will be less fatal (Cook, 1991; Cook et al., 2011; Henigan, 2016). Thus, Braga et al. (2021) argue that the crux of the debate centers on what researchers refer to "firearm instrumentality," or whether the presence of firearms makes a criminal event more lethal.

While Braga et al. (2021) bring attention to an important point of contention within the debate, their brief synopsis of the two sides in the great debate overlooks arguments pertaining to the perceived ability, or inability, of gun legislation being able to effectively reduce firearm availability, particularly to dangerous and "at risk" people. This issue is a focal point in the debate and a common topic that is an important factor for the general public. Indeed, it is almost commonsensical to believe that if there

were *no* guns, then there would be *no* gun crime; certainly, proponents of both sides know this to be true. The reality though is that there *are* a lot of guns. In fact, the United States civilian gun ownership rate is the highest in the world, with estimates suggesting that there are more than 350 million guns owned by Americans (Institute of Medicine & National Research Council, 2013). These instruments serve both legitimate (i.e., recreation, hunting, self-defense, etc.) and illegitimate purposes (i.e., criminal activities; Cook et al., 2011; Kleck et al., 2016). Thus, the real questions in the debate are (1) will strict gun control policies be able to effectively keep guns away from dangerous and "at risk" individuals who may want to harm themselves or others? and (2) will restrictive gun control measures prevent law abiding citizens from defending their families, their properties, and their lives?

Opponents of restrictive forms of control believe that more-restrictive gun control policies will do little to disrupt illegal gun markets. They believe that such policies will merely take guns away from law abiding citizens who use firearms for legitimate purposes, including recreation, hunting, and self-defense. Current estimates suggest that there are about 15.2 million hunting license holders in the United States (U.S. Fish & Wildlife Services, 2020) and 9.4 million self-described "gun only" deer hunters (Schmidt, 2020). The data suggest that a significant portion of Americans use firearms as a source of legal recreation and food acquisition. Data also suggest that a significant number of Americans use guns for self-defense purposes. A 2017 report published by researchers at Pew Charitable trust estimated that approximately 1 in 6 gun owners had used their weapon to defend themselves, their families, or their possessions at some point in their life (Parker et al., 2017). While estimates vary greatly, it is speculated that the prevalence of defensive gun usage in the United States ranges from 60,000 to 2.5 million incidents annually (National Research Council, 2013), and whenever guns are used in self-defense, the odds of injury to potential victims is significantly reduced (Cook et al., 2011; Kleck & Gertz, 1995). As such, critics of more-restrictive gun control "argue that gun control laws could increase crime, by disarming prospective victims, reducing their ability to effectively defend themselves, and possibly reducing any deterrent effect that victim gun possession might have on offenders" (Kleck et al., 2016, p.489).

Opponents of more restrictive measures of gun control turn to research demonstrating that a majority of gun crimes are committed by offenders who illegally obtained the firearm used in the crime (Cook, 2018; Roth, 1994). Indeed, research suggests that most gun crimes are committed by individuals who are already, under current regulations, legally disqualified from possessing a firearm due to their age, criminal record, or some other characteristic (Cook, 2018). However, proponents of more-restrictive gun control use this same research to cite the reality that most firearms used to commit crime originate from a legal manufacturing or distribution supply chain (Cook, 2018). Thus, they believe that reducing the number of guns in such markets will ultimately reduce the number of guns available to be used in crimes (Cook et al., 2011).

A recent report published by the RAND Corporation found that members of the scholarly community also tend to conform to this "more-restrictive" or "more-permissive" dichotomy (Morral et al., 2018). Indeed, there is great disagreement among researchers about the extent to which crime can be reduced through gun control. While research has produced mixed results, evidence from more methodologically sound work has indicated that higher levels of firearm ownership has little, if any, effect on overall violent crime rates (Cook & Ludwig, 2006; Cook & Pollack, 2017; Cook et al., 2011) or suicides (Kleck, 2019a, 2019b), and that more-restrictive gun control mechanisms are generally ineffective at reducing crime (Kleck & Patterson, 1993; Kleck et al., 2016; Kleck, 2019b).2 However, some research indicates that there may be an association between rates of community gun ownership and homicide rates (Braga et al., 2021), suggesting that firearm availability may increase the lethality of violent crimes—although Kleck (2021) argues that prior work in this area has produced mixed findings, been tautological, and that the data merely demonstrate a positive relationship between gun ownership and the firearm homicide rates (Kleck, 2021). There also is evidence suggesting that polices intended to restrict dangerous and/or "at-risk" individuals (i.e., felons, the mentally ill, and "alcoholics") from accessing firearms may be associated with reductions in crime, suicides, and violence in the community (Andrés & Hempstead, 2011; Braga et al., 2021; Braga & Cook, 2018; Cook et al., 2011; Kleck, 2019b; Kleck et al., 2016; Sen & Panjamapirom, 2012; Smith & Spiegler, 2020; Wright et al., 1999). However, there is more research needed in this area before firm conclusions can be drawn.

Types of Gun Control

Cook et al. (2011) argue that gun-control measures can be "usefully classified into three categories: those that are intended to reduce overall gun ownership; those that are intended to keep guns away from particularly dangerous people; [and] those that are intended to influence choices about how guns are used and to what effect" (p. 259). Mechanisms that are intended to reduce overall gun ownership are those that attempt to keep guns out of the hands of all citizens—law abiding or non-law abiding. Such policies include firearm bans, limited and restrictive licensing, gun buy-back programs, and policies designed to make firearms and ammunition more expensive, and subsequently, less affordable to the average citizen. Although research on public support for such strategies is limited, data suggest that a slight majority of the general public supports banning the manufacturing, possession, and sale of some types of firearms, such as assault rifles, from public use (Gallup, 2020), but few support policies banning other types of firearms, such as handguns, from public use (Brenan, 2020).3 Mechanisms that are intended to keep guns away from dangerous or "at-risk" people refer to strategies aimed at keeping guns away from those who are likely to use them for criminal purposes, or to self-harm, such as felons, the untrained, and the mentally ill (Morrall, 2018). Measures within this category of gun control include increased screening and monitoring of buyers and dealers in legal gun markets, creating a national firearms database, and outlawing "straw" (i.e., secondary market) purchases. Generally, the public is more supportive of these types of gun control strategies, especially those aimed at barring gun sales to the mentally ill, and those on "no fly" or on

law enforcement “watch lists” (Parker et al., 2017 Schaeffer, 2019). The third category of “usefully classified” gun control mechanisms are those intended to influence choices about how guns are used and to what effect. This category includes strategies aimed at increasing firearm design regulation (e.g., manufacturing more “smart guns”) and implementing various forms of “focused deterrence” policing strategies, such as “gun oriented patrol tactics” and “hot spots policing” (Cook et al., 2011, p. 280) Recent research suggests that many members of the general public may have favorable views of smart guns as a safety and crime reduction tool by indicating that they would be inclined to purchase such weapons if they became readily available (Wallace, 2016). Controversial, research also indicates mixed public support for “gun oriented” policing tactics, such as stop, question, and frisk polices (Evans & Williams, 2017) which is further complicated by the recent surge in firearm purchases (Schaeffer, 2021).

Prior Research Assessing Correlates of Support for Gun Control

Trends in public polling tend to inform the direction of gun policies and the overall sentiment of potential voters toward certain restrictions or measures to be introduced. Much of this data is derived from national surveys which are administered through organizations such as Gallup, RAND, and similar organizations via cross-sectional designs. Wozniak (2017) notes that public opinion toward gun control has remained relatively consistent although support for more restrictive laws concerning the sales of firearms has declined since the 1990s. The most recent data collected by Gallup (2020) suggest that approximately 57 percent of Americans believe that the laws covering the sale of firearms should be made more strict, which is down more than 20 percentage points since when the organization first started tracking these data in the early 1990s, but up more than 10 percentage points from the start of the 2010s. One aspect that remains relatively high is the support for background checks and limiting access for dangerous or “at-risk” individuals. Barry et al. (2019) find similar support for the use of universal background checks and limiting access for dangerous or “at-risk” individuals regardless of ownership status to include knowledge and/or safety courses for first-time owners.

Researchers have spent considerable time examining correlates of support for gun control, finding mixed support across demographic groups. Due to this mixed support, an array of proposed gun control measures and policies have faced backlash amid American constituents (see Giffords Law Center for a review of state-specific measures). Generally, though, this work has found that men (Ellison, 1991; Kauder, 1993; Livingston & Lee, 1992; Marciniak & Loftin, 1991; Merino, 2018; O’Brien et al., 2013; Pederson et al., 2015; Tyler & Lavrakas, 1983), whites (Filindra & Kaplan, 2017; McClain, 1983; Merino, 2018; Secret & Johnson, 1989), those who are politically conservative (Filindra & Kaplan, 2017; Merino, 2018), those who live in rural communities (Brennan et al., 1993; Parker et al., 2017) and gun owners (Filindra & Kaplan, 2017; Merino, 2018) are less supportive of more-restrictive forms of gun control than those in reference groups. Additionally, there is evidence suggesting that those who have greater exposure to, and familiarity with firearms (Ellison, 1991; Hill

et al., 1985; Kruis et al., 2020; Rosen, 2000; Tyler & Lavrakas, 1983) favor more-permissive forms of gun control. Recently, Filindra and Kaplan (2017) found that "drivers of support for gun control" were generally consistent for members of racial minority groups and whites (p. 413). The authors noted that fear, or concern, of crime was generally positively related to support for more-restrictive forms of gun control across racial groups, while political conservativism, being a crime victim, owning a gun, and racial prejudice (i.e., held by Whites and Latinos) were inversely related to support for more-restrictive forms of gun control. Their study, along with earlier work (see Filindra & Kaplan, 2016), shed light on a possible relationship between racial resentment and Whites' and Latinos' attitudes toward gun control, suggesting that racism, generally, is a correlate of support for less-restrictive forms of gun control among these groups. However, gun ownership among minority and BIPOC communities has continued to rise with the largest increases occurring during the social and civil unrest associated with 2020 (Curcuruto, 2020; Parker et al., 2017). Crifasi et al. (2021) extended this line of inquiry and found that minority and BIPOC communities tend to favor less-restrictive gun control measures especially when police or the criminal justice system is involved, but general support for reduced access to firearms remains mixed across group membership.

Other researchers have found that men, generally, are less supportive of more-restrictive forms of gun control (see Ellison, 1991; Merino, 2018; O'Brien et al., 2013; Pederson et al., 2015; Tyler & Lavrakas, 1983). Some scholars have suggested that guns and pro-gun attitudes serve as a way for men to demonstrate masculinity and to bond with other men. These scholars argue that gun control is perceived as a threat to "male intimacy" and male identity, thus men are more likely to be emersed in gun culture and have favorable views of guns (see Carlson et al., 2018). Research has also documented an inverse relationship between educational attainment and support for more-restrictive forms of gun control (Newman & Hartman, 2019). Kruis et al. (2020) recently extended this line of inquiry by examining the relationship between gun knowledge—operationally defined as "one's understanding of gun legislation, gun policies, and firearm crime"—and support for general gun control using a convenience sample of college students (p. 33). The authors found an inverse relationship between gun knowledge and support for stricter forms of gun control, concluding that students who had greater understanding of gun legislation, gun crime, and gun functioning, were less likely to favor stricter forms of gun control than students with less knowledge in these areas. While informative, this study suffered from a few crucial methodological limitations that preclude the generalizability of the findings. Notably, findings were based on data collected from college students through convenience sampling at three universities. Additionally, the measures of gun control and gun knowledge were broad and prohibited the examination of specific types of gun knowledge and various categories of gun control. Accordingly, the authors called for more work to be done in this area.

Current Study

The goal of the current study was to help contribute to research in this area by exploring public perceptions of various types of gun control mechanisms. In many ways the current study serves as an extension of Kruis et al.'s (2020) research. Specifically, the methodology employed by Kruis et al. (2020) were applied to the general public, using a representative sample of Pennsylvania residents ($N = 522$) to help answer the following two overarching research questions:

- R1: What are the training experiences, safety precautions, and defensive gun use reported by gun owners in Pennsylvania?
- R2: What is the relationship between firearm knowledge and support for more-restrictive gun control policies?

Regarding our first research question, we were interested in assessing training experiences, safety precautions, and defensive gun usage reported by Pennsylvania gun owners. We were also interested in comparing demographic characteristics, victimization experiences, gun knowledge, and support for different types of gun control between gun owners and non-owners. Our second research question was concerned with testing the generalizability of Kruis et al.'s (2020) findings from students to members of the general public. Notably, we were interested in expanding upon Kruis et al.'s measures to better explore the relationship between different types of firearm knowledge (i.e., knowledge of gun crime, knowledge of gun policy, and knowledge of gTillyerun functioning) and various categories of gun control (i.e., general gun control, policies aimed at reducing overall gun ownership, and policies aimed at keeping guns away from dangerous and "at risk" people). We hypothesized that increased firearm knowledge would be inversely related to greater support for gun control.

Methods

Sample

Data for this project came from a larger study aimed at measuring public attitudes toward a variety of social phenomena, including school security measures, campus carry, and perceptions of the police. Specifically, data came from a 64-question original survey created by the authors and administered via the Qualtrics survey platform. The authors used the marketing research team at Qualtrics to locate and recruit a sample of 500+ English speaking residents of Pennsylvania aged 18 or older. Qualtrics maintains active market research panels of more than six million English speaking, non-institutionalized adults capable of giving consent. Participants join a panel through one of three different methods, including a "double opt-in," direct recruitment by the marketing research team, or voluntary sign up. In exchange for their voluntary participation in surveys, panelists are compensated with small point-based incentives that can be redeemed in various forms, such as Sky Miles or gift cards.

In the Fall of 2020, Qualtrics sent an invitation link to panelists inviting them to participate in the survey. Interested panelists were first screened to determine eligibility. Efforts were made to ensure the representativeness of the sample in terms of race, age, and biological sex. That is, the marketing team was contracted to ensure that participants were screened in a way such that the final sample would be representative of the Pennsylvania general population in terms of race, age, and biological sex. Then, potential participants were shown an informed consent document specifying the goals of the study, potential risks and benefits, and contact information for the principal investigator and institutional review board. Those who consented were then directed to the online survey where they were presented with 64 Likert scale, text entry, and essay-based questions. In total, 680 panelists clicked on the invitation link and participated in the survey in some capacity. Data quality assurance tests revealed that 522 of these cases were valid and complete responses. Thus, all models specified below were based on the 522 cases with complete and valid data. It is important to note at the onset that our data collection strategy represent a convenience sampling approach. That said, comparisons with population estimates revealed that the data collected were generally representative of the Pennsylvania general population in terms of race and sex at the time of data collection, as well as income and geographical location (i.e., rural or urban). However, the median age of the sample (47) was slightly older than that of the general Pennsylvania population (41).

Measures

Support for Gun Control

The goal of this study was to assess residents' support for various categories of gun control. Three different measures were used to capture participants' disposition toward stricter forms of gun regulation. First, the 9-item measure used in Kruis et al.'s (2020) original study was used to capture respondents' disposition toward broad forms of gun control. Items included: (1) "Strict gun legislation will stop future gun-related incidents/mass shootings," (2) "Guns should not be used for recreational reasons (i.e., hunting, sporting, etc.)," (3) "Gun laws should differentiate between handguns and other guns," (4) "Military type guns should be banned from public use," (5) "Mental health screenings should be required to purchase any firearm," (6) "I think all types of guns should be banned from public use," (7) "I believe that the Second Amendment needs to be revised to reflect modern times," (8) "Second Amendment rights allow more guns to be available to the public than necessary," and (9) "I believe that current gun legislation is appropriate." Response categories followed a 5-point Likert scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (5). Item #9 was reverse coded and then responses were summed and averaged to create a continuous measure of broad support for gun control with higher numbers indicative of greater support for enhanced firearm regulation ($\alpha = 0.832$).

To further assess differences in support for distinct types of gun control policies, two measures from Cook et al.'s (2011) gun control trichotomy were also created and included in analyses. The first measure was intended to capture support for gun control mechanisms aimed at reducing overall firearm ownership. Two items from the survey were used to capture this category of gun control strategies: (1) "Guns should not be used for recreational purposes (i.e., hunting, sporting, etc.)" and (2) "I think all types of guns should be banned from public use." Responses followed a 5-point Likert scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (5). The two items were combined and averaged to create a scale variable with higher scores reflective of greater support for policies intended to reduce overall firearm ownership ($\alpha = 0.797$). The second specific type of gun control measured was support for policies intended to keep guns away from dangerous and/or "at-risk" individuals, such as criminals, the untrained, and the mentally ill. Three items for the survey were used to measure participants' support for this category of gun control policies: (1) "I believe that mandatory gun education will lead to fewer gun related deaths in the U.S.," (2) "There should be required background checks for all guns purchases," and (3) "Mental health screenings should be required to purchase any firearm." Responses followed a 5-point Likert scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (5). The items were combined and averaged to create a scale variable with higher scores reflective of greater support for policies intended to keep guns out of the hands of dangerous and "at risk" people ($\alpha = 0.721$).

Knowledge

For the purposes of this project, knowledge referred to a participant's understanding of gun-related phenomena. To capture knowledge, participants were given a "Knowledge Test." Three different domains of knowledge were assessed: (1) knowledge of gun crime, (2) knowledge of gun policy, and (3) knowledge of gun functioning. Knowledge of gun crime refers to participants' level of understanding of gun-related crime in the United States. Items used to capture this measure included: (1) "Gun related homicides have increased over the last 30 years throughout the U.S.," (2) "In the last 10 years, most gun related deaths per year in the U.S. have been from suicides," (3) "A majority of firearms used in criminal offenses were obtained illegally," (4) "Military-style weapons (for example, "assault rifles") are used in the majority of gun-related crimes," (5) "Most firearm owners never commit a gun crime," and (6) "Most mass shootings in the United states are done with legally obtained firearms." Knowledge of gun policy refers to participants' level of understanding of gun-related purchasing and ownership policies. Items used to capture this measure included: (1) "In the U.S., it is illegal to own a fully automatic firearm without a permit," (2) "When purchasing a firearm from a retail store, a background check is NOT required," (3) "When purchasing a firearm online from a retail store, one must go through a licensed firearm dealer to acquire it," (4) "In the U.S., the legal purchasing age of rifles is lower than that of handguns," (5) "In the U.S., felons cannot legally own a firearm," and (6) "In the U.S., authorities can legally confiscate guns solely based on an individual's mental illness." Knowledge of gun functioning refers to a participant's level of understanding of how guns work (i.e., gun-related functioning and operational procedures). Items

used to capture this measure included: (1) "The "AR" in AR-15 stands for "Assault Rifle[4]", (2) "A semi-automatic firearm only fires one round of ammunition per single pull of the trigger," (3) "The "magazine" is the area of the gun that feeds ammunition into the chamber of the gun," (4) "An individual must manually engage the hammer on a double-action firearm before the weapon can fire a bullet," (5) "A bolt-action rifle requires the user to manually cycle every round before the rifle can be fired," and (6) "All firearms must legally have a safety setting to keep the firearm from firing." Response categories to all questions included "True," "False," and "I Don't" Know." Correct answers were coded as a "1" and incorrect answers were coded as a "-1." Participants were not penalized for selecting "I don't know" (coded as "0"). Individual items were then combined to create an index measure ranging from − 6 to + 6 with greater scores indicating greater knowledge. See Appendix 1 for specific coding.[5]

Experiences

Prior work has shown that experiences with firearms and crime can influence dispositions toward firearms (Ciomek et al., 2020; Kleck, 2019a; Kruis et al., 2020). As such, five variables were used to capture participants' experiences with firearms and crime, including (1) exposure to firearms, (2) perceived firearm familiarity, (3) criminal victimization experience, (4) vicarious criminal victimization experience, and (5) vicarious shooting victimization experience. Exposure was captured using Kruis et al.'s (2020) 10-item firearm exposure scale ($\alpha = 0.955$), with items including "I regularly use guns for recreational purposes" and "I am around guns frequently." Perceived familiarity was captured using Kruis et al.'s (2020) 3-item perceived familiarity scale ($\alpha = 0.872$), with items including "I am familiar with current gun legislation in the United States" and "I am familiar with current gun legislation in my state of residence." Participants were also asked to indicate whether they had ever been the victim of a crime (1 = "yes" and 0 = "no"), if someone close to them had ever been the victim of a crime (1 = "yes" and 0 = "no"), and if they knew someone who had ever been shot with a firearm (1 = "yes" and 0 = "no").

Training, Safety Precautions, and Gun Use

As the first research question for this project was concerned with examining the characteristics of gun owners, participants were asked to indicate whether they owned a firearm (1 = "yes" and 0 = "no"). Those who indicated that they owned a gun were then presented with a series of questions intended to capture their experiences with firearm-related training. Specifically, gun owners were asked if they (1) had taken a formal gun safety course, such as a basic hunter safety education course (1 = "yes" and 0 = "no"), (2) received informal gun safety training, through a friend or family member (1 = "yes" and 0 = "no"), and/or (3) taken a gun self-defense course (1 = "yes" and 0 = "no"). Owners were also asked to report whether or not they took various safety precautions with their firearms, such as using a gun safe or gun lock, keeping their guns unloaded, and/or storing ammunition away

from their firearm(s) (1 = “yes” and 0 = “no”). Additionally, gun owners were also asked to report if they had ever used their gun to defend themselves[6] (1 = “yes” and 0 = “no”).

Demographics

Measures of sex (1 = “male,” 0 = “female”), race (1 = white, 0 = non-white), age (0–max), geographical background (1 = “Urban,” 2 = “Suburban,” and 3 = “Rural”), income (1 = “Less than $10,000” through 12 = “More than $150,000”) and political affiliation (1 = “Republican,” 2 = “Democrat,” and 3 = “Other”) were also captured and included as control variables in the analyses.

Analytic Strategy

Data were analyzed using SPSS version 27. The analysis consisted of 3 main steps. First, all data were cleaned, coded, and preliminary analyses run to assess measures of central tendency and dispersion. Factor analyses (i.e., Principal Component Analysis and Principal Axis Factor Analysis) were used along with reliability estimations to help construct scale variables during the initial data screening process. Support for individual gun control measures were estimated by combining “strongly agree” with “agree” responses and then ranked to help illustrate public support for specific types of gun control strategies. Second, bivariate analyses were conducted to examine differences in mean scores and response categories between gun owners and non-owners. Third, a series of OLS regression models were estimated to explore the relationship between knowledge of gun crime, gun legislation, gun functioning and support for gun control, controlling for relevant “predictors.[7]” All assumptions of OLS regression were checked prior to constructing the final models reported below. All variables inputted into the regression model had tolerances above 0.1 and Variance Inflation Scores (VIFs) below 10 (Pallant, 2016). Normal Quantile–Quantile and Probability-Probability plots indicated the presence of relatively normal distributions, and skewness and kurtosis values for the dependent variables fell within the acceptable range for analyses (− 2.00 and + 2.00, Field, 2016).

Results

Descriptive Statistics

Table 1 displays participant demographic information and descriptive statistics. As indicated in Table 1, a majority of participants were white (76.4%) and female (50.4%). Participants were fairly evenly distributed in their political affiliation, with about 41 percent identifying as “Democrat,” 37 percent identifying as “Republican,” and 22 percent identifying as “Other.” The mean age of the sample was 49.03 years old. More participants indicated suburban backgrounds (42.1%) than urban (37.2%) and rural (20.7%) backgrounds. In terms of income, the mean score reported was 6.70, suggesting

an average household income between $50,000 and $70,000. A little more than a quarter of the sample (27.8%) indicated being a gun owner. Approximately 40 percent of the sample knew a victim of a crime (40.6%) or indicated being the victim of a crime themselves (39.7%). Nearly a third of the sample reported knowing someone who had been shot (32.4%). Regarding gun-related experiences, most participant's indicated moderate firearm exposure (M = 2.51, SD = 1.25) and a slightly elevated estimate of their perceived familiarity (M = 3.40, SD = 1.00) with current firearm legislation. In terms of actual gun knowledge, participants had more knowledge of gun policy (M = 2.00, SD = 2.16) than gun crime (M = 0.64, SD = 2.08) and gun functioning (M = 0.04, SD = 1.86). In the aggregate, participants expressed moderate support for our general measure of broad gun control policies (M = 3.28, SD = 0.90). However, participants were more supportive of policies intended to keep guns away from dangerous and "at risk" people (M = 4.10, SD = 0.88) than they were of policies intended to reduce overall ownership (M = 2.48, SD = 1.31).

Table 1.

Participant demographic information and descriptive statistics (N = 522)

Variable	N (%)	M	SD	Scale Min.–Max.
Demographics				
Male	259 (49.6)			
White	399 (76.4)			
Age		49.03	18.05	18–93
Political identification				
Republican	191 (36.6)			
Democrat	214 (41.0)			
Other	117 (22.4)			
Location				
Urban	194 (37.2)			
Suburban	220 (42.1)			
Rural	108 (20.7)			
Income		6.70	3.70	1–12
Gun owner	145 (27.8)			
Experiences				
Victim of crime	207 (39.7)			
Know a victim of crime	212 (40.6)			
Know shooting victim	169 (32.4)			
Exposure (α = .955)		2.51	1.25	1–5
Perceived familiarity (α = .872)		3.40	1.00	1–5
Knowledge				
Gun crime		0.64	2.08	− 6–6
Gun policy		2.00	2.16	− 6–6
Gun functioning		0.04	1.86	− 6–6
Support for gun control				

Variable	N (%)	M	SD	Scale Min.–Max.
General gun control (α = .832)		3.28	0.90	1–5
Reduce ownership (α = .797)		2.48	1.31	1–5
Dangerous people (α = .721)		4.10	0.88	1–5

Open in a new tab

Comparing Owners to Non-Owners

Table 2 displays the results from bivariate analyses (i.e., t-tests and chi-square tests) comparing gun owners (N = 145) to non-owners (N = 377). With the exception of age, gun owners were different from non-owners in all other demographic measures assessed. On average, gun owners were more likely to be male, white, and republican ($p \leq 0.001$). They were also more likely to have rural backgrounds ($X^2 = 6.315$, $p \leq 0.05$) and reported higher incomes ($t = -3.481$, $p \leq 0.01$). Results also show that gun owners were different from non-owners in terms of gun-related experiences, gun knowledge, and support for gun control. Specifically, compared to non-owners, gun owners were more likely to report being the victim of a crime ($X^2 = 6.235$, $p \leq 0.05$) and to know someone who has been shot ($X^2 = 5.331$, $p \leq 0.05$). Owners also reported greater gun exposure ($t = -11.810$, $p \leq 0.001$) and familiarity ($t = -5.330$, $p \leq 0.05$) than non-owners. Gun owners were found to have greater knowledge of gun crime ($t = -2.831$, $p \leq 0.01$), gun policy ($t = -5.317$, $p \leq 0.001$), and gun functioning ($t = -5.116$, $p \leq 0.001$) than non-owners, and indicated less support for general gun control mechanisms ($t = 5.346$, $p \leq 0.001$), policies that seek to reduce overall gun ownership ($t = 3.318$, $p \leq 0.05$), and policies intended to keep guns away from dangerous and “at risk” people ($t = 1.991$, $p \leq 0.05$).

Table 2.

Comparing gun owners to non-owners (N = 522)

	Owner (*N* = 145)		**Non-owner (*N* = 377)**		**Bivariate comparisons**
Variable	**N (%)**	**M (SD)**	**%**	**M (SD)**	X^2/t
Demographics					
Male	102 (70.3)		157 (41.6)		34.506***
White	127 (87.6)		272 (72.1)		15.388***
Age		51.00 (17.25)		48.27 (18.31)	− 1.548
Political identification					18.610***
Republican	74 (51.0)		117 (31.0)		
Democrat	43 (29.7)		171 (45.4)		
Other	28 (19.3)		89 (23.6)		
Location					6.315*
Urban	46 (31.7)		148 (39.3)		
Suburban	59 (40.7)		161 (42.7)		
Rural	40 (27.6)		68 (18.0)		
Income		7.57 (3.46)		6.37 (3.74)	− 3.481**
Experiences					
Victim of crime	70 (48.3)		137 (36.3)		6.235*
Know a victim of crime	67(46.2)		145 (38.5)		2.605

	Owner (N = 145)		Non-owner (N = 377)		Bivariate comparisons
Variable	**N (%)**	**M (SD)**	**%**	**M (SD)**	X^2/t
Know shooting victim	58(40.0)		111 (29.4)		5.331*
Exposure		3.43(1.10)		2.15 (1.11)	− 11.810***
Perceived familiarity		3.76 (1.01)		3.26 (0.97)	− 5.330***
Knowledge					
Gun crime		1.05 (2.17)		0.49 (2.02)	− 2.831**
Gun policy		2.79 (2.08)		1.70 (2.12)	− 5.317***
Gun functioning		0.77 (2.14)		− 0.24 (1.66)	− 5.116***
Support for gun control					
General gun control		2.91 (1.02)		3.42 (0.81)	5.346***
Reduce ownership		2.15 (1.43)		2.60 (1.23)	3.318*
Dangerous people		3.97 (0.98)		4.15 (0.84)	1.991*

Open in a new tab

*p < .05, **p < .01, ***p < .001 (two-tailed tests)

Training, Safety, and Defensive Gun Usage

Our first overarching research question was concerned with examining training experiences, safety precautions taken, and defensive gun usage reported by gun owners. Table 3 displays characteristics of the gun owners in our sample. As indicated in Table 3, most owners indicated receiving some form of gun training (89.7%). Nearly three-quarters of the gun owners in our sample reported completing a formal safety training course, such as a basic hunter safety education course (72.4%). A little more than 70 percent indicated receiving informal safety training from a friend or family member, and 42.8 percent reported taking a gun self-defense course. Interestingly, 10.3 percent of all the gun owners in our sample noted that they had not received any form of safety training—formal or informal—nor

had they taken a gun self-defense class. In terms of safety precautions taken, most gun owners indicated taking one of measures included in the survey (95.9%). Specifically, 62.1 percent indicated using a gun safe for storage purposes, 39.3 percent reported using gun locks, 50.3 percent expressed that they stored ammunition away from firearms, and 54.4 percent indicated that they kept their guns unloaded. Just six of the 145 gun owners in our sample (4.1%) reported that they did not use any of the safety precautions assessed in our survey. Regarding defensive gun usage, more than a quarter of gun owners (26.9%) reported that they had used a firearm to defend themselves at some point in their life.

Table 3.

Characteristics of gun owners (N = 145)

Variable	N	%
Training		
Taken a formal gun safety course	105	72.4
Received informal gun safety training	102	70.3
Taken a gun self-defense course	62	42.8
Taken no safety/training class	15	10.3
Safety precautions		
Gun safe	90	62.1
Gun locks	57	39.3
Separate ammunition from firearm	73	50.3
Keep guns unloaded	79	54.4
No precautions	6	4.1
Defensive gun usage	39	26.9

Open in a new tab

Support for Gun Control

Our second overarching research question was concerned with assessing public support for gun control. Two different analyses were used to answer this research question. First, descriptive statistics

were assessed for individual measures of support for gun control and then ranked by level of support. Table 4 displays the findings from these analyses in order of rank. As noted in Table 4, the most publicly supported gun control policy was requiring background checks for all types of gun purchases (86.0%), followed by requiring mental health screenings (79.7%), banning military-style weapons from public use (69.7%), mandating gun education (62.5%), and differentiating laws between handguns and other guns (59.4%). Slightly more than half of the sample also felt that the Second Amendment needed revised "to reflect modern times" (52.7%) and believed that strict gun legislation could stop future gun-related incidents and mass shootings (51.3%). However, most participants did not support completely banning firearms from public use (72.6%)8 or banning guns for recreational purposes, such as hunting and sport shooting (74.1%).

Table 4.

Support for gun control measures by rank (N = 522)

	"Agree" or "Strongly Agree"	
Measure	**N**	**%**
1.There should be required background checks for all guns purchases	449	86.0
2.Mental health screenings should be required to purchase any firearm	416	79.7
3."Military style" guns should be banned from public use	364	69.7
4.I believe that mandatory gun education will lead to fewer gun related deaths in the U.S.	326	62.5
5.Gun laws should differentiate between handguns and other guns	310	59.4
6.I believe that the Second Amendment needs to be revised to reflect modern times	275	52.7
7.Strict gun legislation will stop future gun-related incidents/mass shootings	268	51.3
8.I believe that current gun legislation is appropriate	217	41.6
9.I think all types of guns should be banned from public use	143	27.4
10.Guns should not be used for recreational reasons (i.e., hunting, sporting, etc.)	135	25.9

Open in a new tab

Second, we estimated a series of OLS regression models to examine variables associated with support for gun control. Table 5 displays results from those analyses. Regarding our general measure of gun control, results indicated that the model fit the data well and explained approximately 31 percent of the variance in general support for gun control ($F = 14.901$, $p = 0.000$, $R^2 = 0.312$). Nine of the independent variables in that model were found to be statistically significantly related to support for general gun control ($p \leq 0.05$). Regarding demographic variables, results showed that compared to

Republicans, Democrats ($b = 0.589$, $p \leq 0.001$) indicated more support for gun control. Findings also suggest a marginally significant relationship between identifying as having a “Other” political affiliation ($b = 0.176$, $p \leq 0.010$) and greater support for gun control, compared to identifying as a Republican. Further, results showed that compared to those with rural backgrounds, those with urban backgrounds ($b = 0.234$, $p \leq 0.05$) were more supportive of gun control. Income was also statistically significant ($b = 0.045$, $p \leq 0.001$), with findings suggesting that wealthier individuals were more supportive of gun control. Conversely, gun ownership ($b = -0.234$, $p \leq 0.01$) was found to be negatively associated with support for increased gun control. In terms of experiences, findings indicated that those who had been the victim of a gun crime ($b = 0.188$, $p \leq 0.05$) and those who perceived having greater familiarity with current gun legislation ($b = 0.151$, $p \leq 0.001$) were more supportive of policies associated with increased gun control. Findings also showed that those who indicated greater firearm exposure ($b = -0.119$, $p \leq 0.01$) held less support for general gun control mechanisms. Two measures of gun knowledge were also statistically significant in that model. Results showed that knowledge of gun crime ($b = -0.080$, p $p \leq 0.001$) and knowledge of gun functioning ($b = -0.079$, $p \leq 0.001$) were inversely related to support for general gun control.

Table 5.

Results from OLS regression analyses predicting support for gun control (N = 522)

	General gun control		Reduce ownership		Dangerous people	
Variable	**b**	**SE**	**b**	**SE**	**b**	**SE**
Demographics						
Male	−.005	.074	−.106	.107	−.163*	.081
White	.042	.095	.012	.138	−.053	.104
Age	−.002	.002	−.017***	.003	.008**	.003
Political identification[a]						
Democrat	.589***	.081	.441***	.117	.083	.088
Other	.176†	.092	.001	.133	.128	.101
Location[b]						
Urban	.234*	.099	.560***	.143	−.125	.108
Suburban	.054	.094	.088	.135	−.106	.102
Income	.045***	.010	.033*	.014	.033**	.011
Gun owner	−.234**	.087	−.325**	.126	.006	.095
Experiences						
Victim of crime	.188*	.077	.208†	.112	.115	.084
Know a victim of crime	−.072	.080	−.216†	.116	−.048	.088
Know shooting victim	−.015	.084	−.003	.122	−.072	.092
Exposure	−.119**	.037	.139*	.054	−.182***	.041
Perceived familiarity	.151***	.039	.073	.056	.235***	.042
Knowledge						
Gun crime	−.080***	.017	−.110***	.025	−.030	.019
Gun policy	−.018	.016	−.059*	.024	.017	.018
Gun functioning	−.079***	.020	−.068*	.029	−.077**	.022
Adjusted R^2	.312		.313		.142	
F	14.901		14.992		6.059	

	General gun control		Reduce ownership		Dangerous people	
Variable	**b**	**SE**	**b**	**SE**	**b**	**SE**
P-value	.000		.000		.000	

Open in a new tab

a reference category is “Republican”, *b* reference category is “rural”

$^{\dagger}p \leq .10$, $^{*}p \leq .05$, $^{**}p \leq .01$, $^{***}p \leq .001$ (two-tailed tests)

The model estimating support for gun control policies intended to reduce overall gun ownership was also statistically significant ($F = 14.992$, p = 0.000). The predictors in that model explained approximately 31 percent of the variance in the dependent measure ($R^2 = 0.313$). Nine of the independent variables in that model were found to be statistically significant (p ≤ 0.05) and two exhibited a marginally significant association (p ≤ 0.10). Regarding demographic variables, results showed that age (b = − 0.017, p ≤ 0.001) and gun ownership (b = − 0.325, p ≤ 0.01) were negatively associated with the dependent measure, whereas being a Democrat (b = 0.441, p < 0.001), income (b = 0.033, p ≤ 0.05), and having an Urban background (b = 0.560, p ≤ 0.001) were significantly and positively associated with the dependent measure. In terms of experiences, findings indicated that those who had been the victim of a crime (b = 0.208, p ≤ 0.10) were more supportive of policies associated with reducing overall gun ownership. Interestingly, findings also showed that those who indicated greater firearm exposure (b = 0.139, p ≤ 0.05) held more support for such policies, which is opposite the direction for this variable noted in the first model. Knowing a crime victim was found to exhibit a negative, albeit marginally, significant relationship (b = − 0.216, p ≤ 0.10) with support for policies intended to reduce overall ownership. All measures of gun knowledge were statistically significantly related to support for policies aimed at reducing overall gun ownership. Results showed that knowledge of gun crime (b = − 0.110, p ≤ 0.001), knowledge of gun policy (b = − 0.059, p ≤ 0.05), and knowledge of gun functioning (b = − 0.068, p ≤ 0.05) were inversely related to support for policies intended to reduce overall gun ownership.

The last column in Table 5 shows results from the OLS modeling estimating support for gun control policies intended to keep guns away from dangerous and “at risk” people. Results indicated that the model fit the data well and explained approximately 14 percent of the variance in gun control mechanisms aimed at keeping guns out of the hands of dangerous people (F = 6.059, p = 0.000, $R^2 = 0.142$). Six of the independent variables in that model were found to be statistically significant. Regarding demographic variables, results showed that being male (b = − 0.163, p < 0.05) and younger (b = .008, p ≤ 0.01) were negatively related to the dependent measure, whereas income (b

= 0.033, p ≤ 0.01) was positively associated with support for policies intended to keep guns away from dangerous individuals. In terms of experiences, findings suggested that greater familiarity with current gun legislation (b = 0.235, p ≤ 0.001) was associated with more support for policies intended to keep guns away from dangerous people, whereas greater exposure was associated with less support (b = − 0.182, p ≤ 0.001). Only one measure of gun knowledge was statistically significant in the model. Results showed that knowledge of gun functioning (b = − 0.077, p ≤ 0.01) was inversely related to support for policies intended to keep guns away from dangerous and "at risk" people.[9]

Discussion

This study was concerned with exploring public perceptions of gun control. Specifically, data collected from a representative sample of 522 Pennsylvania residents were used to (1) explore the training experiences, safety practices, and defensive gun usage reported by gun owners, and (2) to examine the correlates of public support for various types of gun control. There are a few findings from analyses that warrant further discussion.

First, there were several notable findings related to training experiences, safety precautions, and defensive gun usage indicated by the gun owners in our sample. Consistent with previous findings, we found that more than 25 percent of the gun owners in our sample had never taken a formal gun safety course, including a basic hunter safety education course (Parker et al., 2017; Kruis et al., 2020). To expand upon prior work, we also attempted to assess gun training through cultural transmission by asking participants if they had received informal gun training, such as training through a family member or friend. We found that approximately 70 percent of gun owners in our sample had received informal training through a family member or friend. In all, a majority of our sampled gun owners reported receiving some form of gun safety training (i.e., 90 percent). However, collectively, findings revealed that about 10 percent of the gun owners in our sample had received no formal or informal training. This estimate is concerning, given that firearm training courses tend to focus on teaching novice gun handlers how to safely use, transport, and store their firearms, as well as introduce them to relevant gun laws (Rowhani-Rahbar et al., 2018). Ill-trained gun owners may be at a greater risk of using their firearms in an unsafe manner or storing them in ways that permit "unauthorized" persons to access and use their weapons, which can result in more firearm-related injuries.

Unfortunately, due to data limitations (i.e., sample size), we were unable to effectively explore the relationship between gun training and safety precautions taken by gun owners. We did find that more than half of the gun owners in our sample reported using gun safes, kept their firearms unloaded at all times, and/or stored ammunition away from firearms in an attempt to prevent others from accessing and/or using their firearms, which helps to prevent accidental discharges. In fact, just six of

the 145 gun owners in our sample (4.1%) reported that they took "no safety" precautions, suggesting that most— "trained" and "untrained" gun owners—took some form of gun safety precaution. Supplementary analyses did reveal that two of the six gun owners who indicated they took none of the listed safety precautions also indicated that they had received no formal or informal gun safety training. These data indicate that there was a higher proportion of non-trained gun owners (13.3%) who suggested taking no safety precaution than there were trained gun owners (3.1%). We do want to caution when interpreting these results for two reasons. First, our measures do not capture the "quality" of training received. Second, as noted above, the number of non-trained gun owners and owners who take no-safety precautions was so small that we were unable to conduct any type of meaningful comparison. As such, we encourage future researchers to explore the relationship between gun training and gun safety more thoroughly. We will note, however, that, in synthesizing prior research in this area, scholars at RAND Corporation (2020) concluded that child access prevention laws, defined as laws that attempt to influence how guns are stored, are effective at reducing unintentional injuries and deaths, as well as suicides, and may be effective at helping to reduce violent crime. Thus, it appears that there may be a relationship between gun storing patterns and rates of firearm-related injuries. As such, if more owners store their weapons properly, then we may see fewer firearm related injuries, suicides, and violent crime.

Another interesting finding emerging from the data was the proportion of defensive gun usage reported by gun owners in our sample. Nearly 27 percent of gun owners in our sample indicated that they had used their gun to defend themselves at some point in their life. This suggests that more than 1 in 4 gun owners in our sample had used their firearm to defend their life, liberty, or property—which, although a slightly higher estimate, mirrors findings reported by the Pew Research Center in 2017 (i.e., 1 in 6 gun owners; see Parker et al., 2017). Other research has found that the prevalence of defensive gun usage in the United States ranges from 60,000 to 2.5 million incidents annually (Institute of Medicine & National Research Council, 2013). Collectively, these findings indicate that a significant portion of gun owners use—or at least perceive that they use—their firearm(s) for self-defense purposes. As such, any efforts aimed at reforming gun policies in the United States should consider this "utility," or using firearms as a tool, prior to implementation. While firearms may currently help contribute to a high number of injuries (CDC, 2020) and crimes (National Institute of Justice, 2019) committed every year in the United States, it is possible that gun control efforts that take guns out of the hands of law-abiding citizens could further exacerbate these numbers by removing a viable protection mechanism from individuals who otherwise may be unable to adequately defend themselves. Prior research has been mixed in findings related to this hypothesis with some work suggested that arming potential victims may be associated with reductions in injuries and loss of property (see Cook et al., 2011; Cook, 1991; Kleck & Gertz, 1995; Southwick, 2000) and other research questioning such claims (Hemenway, & Solnick, 2015). Similarly, and more broadly, prior research on the effects of gun control related to patterns of gun ownership on patterns of violence and crime have produced mixed results, with some research findings indicating little to no effect (Kleck, 2019a; Kleck et al., 2016; Lott, 2013) and others suggesting a positive relationship

between gun ownership and gun crime (Billings, 2020; Ciomek et al., 2020). Accordingly, more research is needed before firm conclusions related to defensive gun usage can be drawn. That said, our data show that gun owners in Pennsylvania may use their weapons in self-defense at a fairly high rate.

Second, there were several interesting findings related to participants' support for various forms of gun control. In the aggregate, the top three supported gun control measures were: (1) required background checks for all types of gun purchases (86.0%), (2) required mental health screenings for gun purchases (79.7%), and (3) banning military type firearms (i.e., AR or AK platforms) from public use (69.7%). Using prior research (see Cook, 2011 and Kruis et al., 2020) we also examined "correlates" of support for gun control measured in three different ways: (1) support for general gun control mechanisms, (2) support for policies aimed at reducing overall gun ownership, and (3) support for policies aimed at keeping firearms away from dangerous people. There were several interesting findings that emerge from those analyses. Notably, most participants seemed to favor polices aimed at keeping guns away from dangerous and "at risk" individuals, such as the untrained, the mentally ill, and justice-involved persons. However, most did not support policies aimed at reducing overall gun ownership (i.e., restricting public gun use and use for recreational purposes)—which is consistent with prior research (Parker et al., 2017).

These findings are important to consider in relation to the efficacy of such policies. The dominate research suggests that gun control intended to keep guns away from dangerous and "at risk" people may be effective at reducing serious violence (Braga & Cook, 2018; Kleck et al., 2016; RAND, 2020), while gun control strategies aimed at reducing community firearm ownership may have little to no effect on overall violent crime rates (Cook & Ludwig, 2006; Cook & Pollack, 2017; Kleck, 2019b).

Similarly, several interesting findings emerged in multivariable modeling. Generally, we found that those who are more supportive of gun control were Democrats, those who had Urban backgrounds, those who had less exposure to firearms, and those with larger annual incomes. We also found a significant relationship between specific types of gun knowledge and support for categories of gun control. Participants who had greater knowledge of gun crime and gun functioning were less supportive of general forms of gun control, and those who had greater knowledge of gun functioning were less supportive of restrictive policies. Consistent with findings reported by Kruis et al. (2020), we found a general inverse relationship between gun knowledge and support for various types of gun control, with a few caveats. We found that those who were more knowledgeable in the areas of gun crime, gun policy, and gun functioning, did not favor more restrictive gun control measures, particularly those aimed at reducing overall gun ownership. However, excluding knowledge of gun functioning, there was no relationship between gun knowledge and support for policies aimed at keeping firearms away from dangerous people, suggesting that both the "knowledgeable" and "non-knowledgeable" are equally likely to support restricted access for potentially dangerous and "at risk" individuals.

Collectively, this research shows that the same gun control strategies with the most public support—and those supported by those with the most gun "knowledge"—are also those with the most empirical support. Similarly, those with the least public support are those that seem to have the least or, at least, questionable empirical support. As such, policymakers may want to direct gun "reform" efforts toward policies intended to keep guns away from persons who are considered to be dangerous or "at risk," such as felons, the untrained, and those who are mentally ill. At the same time, policymakers need to consider the effects that such actions will have on legal acquisition and take efforts to strengthen law abiding citizens' abilities to obtain and use firearms legally. For instance, based on the available scholarly literature, we argue that complete firearm bans will likely have little if any positive effect of crime, and our research shows that such policies are largely unsupported by members of the general public. Related, we also suggest that gun control strategies discussed by Cook and Leitzel (1996) aimed at increasing the price of firearms and ammunition may only prevent law abiding citizens from obtaining weapons and merely increase black market sales or thefts of weapons, which is how most criminals obtain their firearms (Cook, 2018; Roth, 1994). Thus, better approaches to gun regulation will prevent dangerous and "at risk" people from obtaining firearms, while also protecting law-abiding citizens abilities to access firearms. Unfortunately, as noted by Braga et al. (2021) the current research provides us with little guidance on how best to achieve this goal. As such, more scholarly work is needed in this area.

Limitations and Directions for Future Research

The most concerning limitation of this study is that it utilized a cross-sectional research design. As such, the temporal relationship between variables remains unknown. Related, data were collected from a sample of Pennsylvania residents and findings are not generalizable beyond those parameters. Additionally, our measures of gun control overlooked an entire category of gun control mechanisms—those that are intended to influence choices about how guns are used and to what effect. Accordingly, we encourage future researchers to use longitudinal research designs, to examine these findings in other populations, and better attempt to capture all categories of gun control mechanisms in instrumentation.

Conclusion

Despite these limitations, this work contributes to the extant literature in several ways. Notably, findings from this study suggest that most gun owners in Pennsylvania have received some form of safety training and take appropriate safety precautions with their firearms. Moreover, findings reveal that many gun owners use guns for self-defense purposes. Regarding gun control, findings reveal that members of the general public tend to be supportive of policies aimed at keeping guns away from dangerous and "at risk" individuals, such as required background checks for all types of gun purchases, mental health screenings, and mandatory gun education. However, members of the

general public are not supportive of gun control mechanisms aimed at reducing overall firearm ownership, such as public gun bans. Among those who are the least supportive of such polices are those who are the most knowledgeable about gun crime, gun legislation, and gun functioning.

The long-standing debate of gun rights and ownership tends to center around the concept of “needs” and “wants” in relation to the types of firearms available to the public and the measures used to control the access to these firearms. Much of the empirical literature has produced mixed results when assessing the importance of preventative policies and the associated crimes that can be reduced. This study adds to the growing body of literature seeking more information to adequately inform policymakers regarding gun ownership and public opinions toward restrictive gun laws.

Electronic supplementary material

Below is the link to the electronic supplementary material.

Supplementary file1 (DOCX 45.8 kb) (45.8KB, docx)

Appendix 1 Knowledge “Answers”

Knowledge of Gun Crime

1. Gun related homicides have increased over the last 30 years throughout the U.S. (False, see Gramlich, 2019; Gun Violence Archive, 2021; and National Institute of Justice, 2019).
2. In the last 10 years, most gun related deaths per year in the U.S. have been from suicides (True, see Giffords Law Center, 2021a, 2021b, 2021c and Gramlich, 2019).
3. A majority of firearms used in criminal offenses were obtained illegally (True, see Cook, 2017, Clark, 2018, and Fabio et al., 2016).
4. Military-style weapons (for example, “assault rifles”) are used in the majority of gun-related crimes (False, see Koper et al., 2018).
5. Most firearm owners never commit a gun crime (True, see Lott, 2016 and Malcom & Swearer, 2018)
6. Most mass shootings in the United States are done with legally obtained firearms (True, see Follman et al., 2021 and Statista Research Department, 2021)

Knowledge of Gun Policy

1. In the U.S., it is illegal to own a fully automatic firearm without a permit. (True, see Giffords Law Center, n.d.)
2. When purchasing a firearm from a retail store, a background check is NOT required. (False, see NRA-ILA, n.d. and Yablon, 2020).
3. When purchasing a firearm online from a retail store, one must go through a licensed firearm dealer to acquire it. (True, see NRA-ILA, n.d. and Yablon, 2020)
4. In the U.S., the legal purchasing age of rifles is lower than that of handguns. (True, see ATF, 2015).
5. In the U.S., felons cannot legally own a firearm. (True, see Giffords Law Center, 2021)
6. In the U.S., authorities can legally confiscate guns solely based on an individual's mental illness. (True, see Giffords Law Center, 2021).

Knowledge of Gun Functioning

1. The "AR" in AR-15 stands for "Assault Rifle." (False, see National Shooting Sports Foundation, n.d.)
2. A semi-automatic firearm only fires one round of ammunition per single pull of the trigger. (True, see Frontline, n.d.)
3. The "magazine" is the area of the gun that feeds ammunition into the chamber of the gun. (True, see Wintersteen, 2018)).
4. An individual must manually engage the hammer on a double-action firearm before the weapon can fire a bullet. (False, see Gun News Daily, n.d.)
5. A bolt-action rifle requires the user to manually cycle every round before the rifle can be fired. (True, see Huntingsmart, n.d.)
6. All firearms must legally have a safety setting to keep the firearm from firing. (False, Giffords Law Center, n.d.)

Declarations

Conflict of interest

The authors declare that they have no conflict of interest.

Footnotes

[1]Research suggests that those who are mentally ill are at a higher odds of committing suicide, especially with a gun, but have relatively low rates of violent crime commission, including firearm violence. In fact, this work suggests that those who are mentally ill are more likely to be the victim

of a crime than the perpetrator of a crime. Although, given the extent of under-diagnosis among the mentally ill, the relationship between these variables has been difficult to establish. See Swanson et al. (2015) and Ramchand and Ayer (2021).

[2]See Kleck (2021) for a discussion of the quality of research in this area.

[3]Research has found that question wording may influence whether people indicate support for a proposed assault weapons ban (Newport, 2019). Still, the available data suggest a slight majority of the public supports banning assault weapons.

[4]The term "AR" is commonly mistaken to mean "assault rifle" or "automatic rifle" (Palma, 2019).

[5]At the request of reviewers, we have included informational sources after each question to verify our coding. Efforts were made to include sources with commentary to help readers better understand subject matter. We also tried to incorporate informational sources with a Pennsylvania focus, when available, given that our sample is of Pennsylvania residents.

[6]Gun owners were asked, "Have you ever used your gun to defend yourself?".

[7]Here, we refer to "predictor" in the linear manner.

[8]As noted in Table 4, approximately 27 percent of our sample indicated that they felt all guns should be banned from public use. A reviewer suggested that it would be interesting to explore the relationship between political affiliation and support for public gun bans. Results from chi-square test revealed a statistically significant relationship between political affiliation and support for public gun bans ($X^2 = 56.840$, $p < .001$). Specifically, analysis revealed that about 1 in 3 democrats supported such a policy, compared to approximately 1 in 4 Republicans and 1 in 5 individuals who identified as having a "Other" political affiliation.

[9]While we are confident that our measures of gun knowledge are valid and reliable measures, at the requests of the reviewers, we also ran a series of supplemental analyses that omitted "questionable" variables within the indices. For instance, we omitted the variables "Gun related homicides have increased over the last 30 years throughout the U.S." and "A majority of firearms used in criminal offenses were obtained illegally" from knowledge of gun crime. We also omitted "In the U.S., authorities can legally confiscate guns solely based on an individual's mental illness" from knowledge of gun policy, and "The "AR" in AR-15 stands for "Assault Rifle" from knowledge of gun functioning. Results were similar to the final models reported in the manuscript and are available upon request.

Publisher's Note

Contributor Information

Nathan E. Kruis, Email: nek132@psu.edu

Richard L. Wentling, Email: rwentling@psu.edu

Tyler S. Frye, Email: tsf5114@psu.edu

Nicholas J. Rowland, Email: njr12@psu.edu

References

1. Andrés AR, Hempstead K. Gun control and suicide: The impact of state firearm regulations in the United States, 1995–2004. Health Policy. 2011;101(1):95–103. doi: 10.1016/j.healthpol.2010.10.005. [DOI] [PubMed] [Google Scholar]

2. ATF. (2015) *Does a customer have to be a certain age to buy firearms or ammunition from a licensee?* Retrieved July 25, 2021, from https://www.atf.gov/firearms/qa/does-customer-have-be-certain-age-buy-firearms-or-ammunition-licensee

3. Balmert, J. (2021). *As Biden enters white house, Ohio GOP lawmaker pushes 'Second Amendment sanctuary state'*. The Enquirer. Retrieved February 15, 2021, from https://www.cincinnati.com/story/news/politics/2021/01/29/ohio-gop-second-amendment-sanctuary-state-biden/4274810001/

4. Barry CL, Stone EM, Crifasi CK, Vernick JS, Webster DW, McGinty EE. Trends in public opinion on US gun laws: Majorities of gun owners and non-gun owners support a range of measures. Health Affairs. 2019;38(10):1727–1734. doi: 10.1377/hlthaff.2019.00576. [DOI] [PMC free article] [PubMed] [Google Scholar]

5. Billings, S. B. (2020). Smoking gun? Linking gun ownership to crime victimization and neighborhood crime. *Linking Gun Ownership to Crime Victimization and Neighborhood Crime (April 29, 2020)*.

6. Braga AA, Cook PJ. The association of firearm caliber with likelihood of death from gunshot injury in criminal assaults. JAMA Network Open. 2018;1(3):e180833–e180833. doi: 10.1001/jamanetworkopen.2018.0833. [DOI] [PMC free article] [PubMed] [Google Scholar]

7. Braga AA, Griffiths E, Sheppard K, Douglas S. Firearm instrumentality: Do guns make violent situations more lethal? Annual Review of Criminology. 2021;4:147–164. doi: 10.1146/annurev-criminol-061020-021528. [DOI] [Google Scholar]

8. Brenan, M. (2020). *Support for stricter U.S. gun laws at lowest level since 2016.* Gallup. Retrieved February 15, 2021, from https://news.gallup.com/poll/325004/support-stricter-gun-laws-lowest-level-2016.aspx

9. Brennan PG, Lizotte AJ, McDowall D. Guns, southerness, and gun control. Journal of Quantitative Criminology. 1993;9(3):289–307. doi: 10.1007/BF01064463. [DOI] [Google Scholar]

10. Bureau of Justice Statistics. (2020). NCVS Victimization Analysis Tool (NVAT). Retrieved February 15, 2021, from https://www.bjs.gov/index.cfm?ty=nvat

11. Carlson J, Goss KA, Shapira H, editors. Gun studies: Interdisciplinary approaches to politics, policy, and practice. Routledge; 2018. [Google Scholar]

12. Centers for Disease Control and Prevention (2020). Underlying cause of death 1999–2019 on CDC WONDER online database, Retrieved from https://wonder.cdc.gov/controller/datarequest/D76;jsessionid=8547021C770390B83510480403DA

13. Ciomek A, Braga A, Papachristos A. The influence of firearms trafficking on gunshots injuries in a co-offending network. Social Science and Medicine. 2020;259:113114. doi: 10.1016/j.socscimed.2020.113114. [DOI] [PubMed] [Google Scholar]

14. Clark, D. (2018). *Is most gun crime committed by those who illegally possess guns?* Politifact. Retrieved July 25, 2021, from https://www.politifact.com/factchecks/2018/mar/12/john-faso/do-illegal-gun-owners-commit-most-gun-crime-rep-fa/

15. Cook, P. J. (1980). Reducing injury and death rates in robbery. *Policy Analysis*, 21–45.

16. Cook PJ. The technology of personal violence. Crime and Justice. 1991;14:1–71. doi: 10.1086/449183. [DOI] [Google Scholar]

17. Cook, P.J. (2017). *How dangerous people get their guns in America*. CBS News: The conversation. Retrieved July 25, 2021, from https://www.cbsnews.com/news/gun-sales-

how-dangerous-people-get-weapons/

18. Cook PJ. Gun markets. Annual Review of Criminology. 2018;1:359–377. doi: 10.1146/annurev-criminol-032317-092149. [DOI] [Google Scholar]

19. Cook PJ, Braga AA, Moore MH. Gun Control. In: Wilson JQ, Petersilia J, editors. Crime and public policy. Oxford University Press; 2011. pp. 257–292. [Google Scholar]

20. Cook PJ, Leitzel JA. Perversity, futility, jeopardy: An economic analysis of the attack on gun control. Law and Contemporary Problems. 1996;59:91–118. doi: 10.2307/1192211. [DOI] [Google Scholar]

21. Cook PJ, Ludwig J. The social costs of gun ownership. Journal of Public Economics. 2006;90(1–2):379–391. doi: 10.1016/j.jpubeco.2005.02.003. [DOI] [Google Scholar]

22. Cook PJ, Pollack HA. Reducing access to guns by violent offenders. RSF: the Russell Sage Foundation Journal of the Social Sciences. 2017;3(5):2–36. doi: 10.7758/rsf.2017.3.5.01. [DOI] [Google Scholar]

23. Crifasi CK, Ward JA, McGinty EE, Webster DW, Barry CL. Public opinion on gun policy by race and gun ownership status. Preventive Medicine. 2021;149:106607. doi: 10.1016/j.ypmed.2021.106607. [DOI] [PMC free article] [PubMed] [Google Scholar]

24. Curcuruto, J. (2020). *NSSF survey reveals broad demographic appeal for firearm purchases during sales surge of 2020.* National Shooting Sports Foundation. Retrieved July 25, 2021, from https://www.nssf.org/articles/nssf-survey-reveals-broad-demographic-appeal-for-firearm-purchases-during-sales-surge-of-2020/

25. Department of Justice, Government of Canada. (n.d.). *Firearms, accidental deaths, suicides and violent crime: An updated review of the literature with special reference to the Canadian situation.* Retrieved February 15, 2021, from https://www.justice.gc.ca/eng/rp-pr/csj-sjc/jsp-sjp/wd98_4-dt98_4/p3.html#a32

26. Ellison CG. Southern culture and firearms ownership. Social Science Quarterly. 1991;72(2):267–283. [Google Scholar]

27. Evans DN, Williams CL. Stop, question, and frisk in New York City: A study of public opinions. Criminal Justice Policy Review. 2017;28(7):687–709. doi: 10.1177/0887403415610166. [DOI] [Google Scholar]

28. Fabio A, Duell J, Creppage K, O'Donnell K, Laporte R. Gaps continue in firearm surveillance: Evidence from a large US city bureau of police. Social Medicine. 2016;10(1):13–21. [Google Scholar]

29. Federal Bureau of Investigation. (n.d.). *Crime data explorer.* Retrieved February 15, 2021, from https://crime-data-explorer.fr.cloud.gov/explorer/national/united-states/crime

30. Field, A. (2016). *Discovering statistics using IBM SPSS statistics* (4th ed). Los Angeles, CA; Sage.

31. Filindra A, Kaplan NJ. Racial resentment and whites' gun policy preferences in contemporary America. Political Behavior. 2016;38(2):255–275. doi: 10.1007/s11109-015-9326-4. [DOI] [Google Scholar]

32. Filindra A, Kaplan NJ. Testing theories of gun policy preferences among Blacks, Latinos, and Whites in America. Social Science Quarterly. 2017;98(2):413–428. doi: 10.1111/ssqu.12418. [DOI] [Google Scholar]

33. Follman, M., Aronsen, G., & Pan, D. (2021). *US mass shootings, 1982–2021: Data from mother jones' investigation.* MotherJones. Retrieved July 25, 2021, from https://www.motherjones.com/politics/2012/12/mass-shootings-mother-jones-full-data/

34. Friend, D. (2021). *Constitutional carry, 2nd amendment sanctuary, and anti-red flag laws: A look at pro-gun bills in Texas*. The Texan. Retrieved February 15, 2021, from https://thetexan.news/a-look-at-the-pro-gun-bills-filed-in-the-texas-legislature/

35. Frontline. (n.d.). *Hot guns.* PBS. Retrieved July 25, 2021, from https://www.pbs.org/wgbh/pages/frontline/shows/guns/more/faq.html

36. Gallup. (2020). *Guns.* Retrieved February 15, 2021, from https://news.gallup.com/poll/1645/guns.aspx

37. Giffords Law Center. (2021a). *Statistics.* Retrieved July 25, 2021, from https://giffords.org/lawcenter/gun-violence-statistics/

38. Giffords Law Center. (2021b). *Mental health reporting in Pennsylvania*. Retrieved July 25, 2021, from https://giffords.org/lawcenter/state-laws/mental-health-reporting-in-pennsylvania/

39. Giffords Law Center. (2021c). *Firearm prohibitions in Pennsylvania.* Retrieved July 25, 2021, from https://giffords.org/lawcenter/state-laws/firearm-prohibitions-in-pennsylvania/

40. Giffords Law Center. (n.d.) *Machine guns and 50 caliber*. Retrieved July 25, 2021, from https://giffords.org/lawcenter/gun-laws/policy-areas/hardware-ammunition/machine-guns-50-caliber/#footnote_0_5658

41. Gramlich, J. (2019). *What the data says about gun deaths in the U.S.* Pew Research Center. Retrieved July 25, 2021, from https://www.pewresearch.org/fact-tank/2019/08/16/what-

the-data-says-about-gun-deaths-in-the-u-s/

42. Grinshteyn E, Hemenway D. Violent death rates in the US compared to those of the other high-income countries, 2015. Preventive Medicine. 2019;123:20–26. doi: 10.1016/j.ypmed.2019.02.026. [DOI] [PubMed] [Google Scholar]

43. Gun News Daily. (n.d.). *Single action vs. double action: A guide for beginners.* Retrieved from https://gunnewsdaily.com/single-action-vs-double-action/

44. Gun Violence Archive. (2021). *Past summary ledgers*. Retrieved July 25, 2021, from https://www.gunviolencearchive.org/past-tolls

45. Hemenway D, Solnick SJ. The epidemiology of self-defense gun use: Evidence from the National Crime Victimization Surveys 2007–2011. Preventive Medicine. 2015;79:22–27. doi: 10.1016/j.ypmed.2015.03.029. [DOI] [PubMed] [Google Scholar]

46. Henigan DA. Guns don't kill people, people kill people: And other myths about guns and gun control. Beacon Press; 2016. [Google Scholar]

47. Hill GD, Howell FM, Driver ET. Gender, fear, and protective handgun ownership. Criminology. 1985;23(3):541–552. doi: 10.1111/j.1745-9125.1985.tb00353.x. [DOI] [Google Scholar]

48. Huntingsmart. (n.d.). *The firing cycle of a bolt action rifle.* Retrieved July 25, 2021, from https://www.thecampfirecollective.com/knowledge-base/us/huntingsmart/03/09/

49. Institute of Medicine and National Research Council . Priorities for research to reduce the threat of firearm-related violence. National Academies Press; 2013. [Google Scholar]

50. Kauder NB. One-gun-a-month: Measuring public opinion concerning a gun control initiative. Behavioral Sciences and the Law. 1993;11(4):353–360. doi: 10.1002/bsl.2370110403. [DOI] [Google Scholar]

51. Kleck G. Point blank: Guns and gun violence in America. Aldine de Gruyter; 1997. [Google Scholar]

52. Kleck, G. (2021). The continuing vitality of flawed research on guns and violence: A comment on Fridel (2020). *Justice Quarterly*, 1–9.

53. Kleck G. Macro-level research on the effect of firearms prevalence on suicide rates: A systematic review and new evidence. Social Science Quarterly. 2019;100(3):936–950. doi: 10.1111/ssqu.12602. [DOI] [Google Scholar]

54. Kleck G. Regulating guns among young adults. American Journal of Criminal Justice. 2019;44(5):689–704. doi: 10.1007/s12103-019-09476-6. [DOI] [Google Scholar]

55. Kleck G, Gertz M. Armed resistance to crime: The prevalence and nature of self-defense with a gun. The Journal of Criminal Law and Criminology. 1995;86:150–187. doi: 10.2307/1144004. [DOI] [Google Scholar]

56. Kleck G, Patterson EB. The impact of gun control and gun ownership levels on violence rates. Journal of Quantitative Criminology. 1993;9(3):249–287. doi: 10.1007/BF01064462. [DOI] [Google Scholar]

57. Kleck G, Kovandzic T, Bellows J. Does gun control reduce violent crime? Criminal Justice Review. 2016;41(4):488–513. doi: 10.1177/0734016816670457. [DOI] [Google Scholar]

58. Koper CS, Johnson WD, Nichols JL, Ayers A, Mullins N. Criminal use of assault weapons and high-capacity semiautomatic firearms: An updated examination of local and national sources. Journal of Urban Health. 2018;95(3):313–321. doi: 10.1007/s11524-017-0205-7. [DOI] [PMC free article] [PubMed] [Google Scholar]

59. Kruis NE, Wentling RL, Heirigs MH, Ishoy GA. Assessing the impact of knowledge and location on college students' perceptions of gun control and campus carry policies: A multisite comparison. American Journal of Criminal Justice. 2020;45(1):25–47. doi: 10.1007/s12103-019-09499-z. [DOI] [Google Scholar]

60. Libby NE, Corzine J. Lethal weapons: Effects of firearm types on the outcome of violent encounters. Justice Research and Policy. 2007;9(2):113–137. doi: 10.3818/JRP.9.2.2007.113. [DOI] [Google Scholar]

61. Livingston MM, Lee MW. Attitudes toward firearms and reasons for firearm ownership among nonurban youth: Salience of sex and race. Psychological Reports. 1992;71(2):576–578. doi: 10.2466/pr0.1992.71.2.576. [DOI] [Google Scholar]

62. Lott JR. More guns, less crime: Understanding crime and gun control laws. University of Chicago Press; 2013. [Google Scholar]

63. Lott, J. R. (2016). Concealed carry permit holders across the United States: 2016. Available at SSRN 2814691.

64. Lucey, C. (2021). *Biden's gun-policy plans start to take shape*. The Wall Street Journal. Retrieved February 15, 2021, from https://www.wsj.com/articles/bidens-gun-policy-plans-start-to-take-shape-11613135990

65. Malcom, J & Swearer, A. (2018). *Here are 8 stubborn facts on gun violence in America*. The Heritage Foundation. Retrieved July 25, 2021, from https://www.heritage.org/crime-and-justice/commentary/here-are-8-stubborn-facts-gun-violence-america

66. Marciniak LM, Loftin C. Measuring protective handgun ownership. Criminology. 1991;29(3):531–540. doi: 10.1111/j.1745-9125.1991.tb01078.x. [DOI] [Google Scholar]

67. McClain PD. Determinants of black and white attitudes toward gun regulation: A research note. Journal of Criminal Justice. 1983;11(1):77–81. doi: 10.1016/0047-2352(83)90100-9. [DOI] [Google Scholar]

68. Merino SM. God and guns: Examining religious influences on gun control attitudes in the United States. Religions. 2018;9(6):189. doi: 10.3390/rel9060189. [DOI] [Google Scholar]

69. Morral, A. R., Schell, T.L., & Tankard, M. (2018). The magnitude and sources of disagreement among gun policy experts. RAND Corporation. Retrieved February 15, 2021, from https://www.rand.org/pubs/research_reports/RR2088z1.html . Also available in print form.

70. Morrall A. The science of gun policy: A critical synthesis of research evidence on the effects of gun policies in the United States. Rand Health Quarterly. 2018 doi: 10.7249/RR2088. [DOI] [PMC free article] [PubMed] [Google Scholar]

71. Naghavi M, Marczak LB, Kutz M, Shackelford KA, Arora M, Miller-Petrie M, Tran BX. Global mortality from firearms, 1990–2016. JAMA. 2018;320(8):792–814. doi: 10.1001/jama.2018.10060. [DOI] [PMC free article] [PubMed] [Google Scholar]

72. National Institute of Justice. (2019). *Gun violence in America.* Retrieved February 15, 2021, from https://nij.ojp.gov/topics/articles/gun-violence-america

73. National Shooting Sports Foundation. (n.d.). *Modern sporting rifle: Introduction.* Retrieved July 25, 2021, from https://www.nssf.org/msr/

74. Newburger, E. (2021). *Biden calls for congress to pass stricter gun laws on anniversary of Parkland mass shooting*. CNBC. Retrieved February 15, 2021, from https://www.cnbc.com/2021/02/14/biden-calls-on-congress-to-reform-gun-laws-on-anniversary-of-parkland-shooting.html

75. Newman BJ, Hartman TK. Mass shootings and public support for gun control. British Journal of Political Science. 2019;49(4):1527–1553. doi: 10.1017/S0007123417000333. [DOI] [Google Scholar]

76. Newport, F. (2019). *Analyzing surveys on banning assault weapons*. Gallup. Retrieved February 15, 2021, from https://news.gallup.com/opinion/polling-matters/268340/analyzing-surveys-banning-assault-weapons.aspx

77. NRA-ILA. (n.d.) *Background checks for guns*. Retrieved July 25, 2021, from https://www.nraila.org/get-the-facts/background-checks-nics/

78. O'Brien K, Forrest W, Lynott D, Daly M. Racism, gun ownership, and gun control: Biased attitudes in US whites may influence policy decisions. PLoS ONE. 2013;8(10):e77552. doi: 10.1371/journal.pone.0077552. [DOI] [PMC free article] [PubMed] [Google Scholar]

79. Oliphant, B.J. (2017). *Bipartisan support for some gun proposals, stark partisan divisions on many others.* Pew Charitable Trust. Retrieved February 15, 2021, from https://www.pewresearch.org/fact-tank/2017/06/23/bipartisan-support-for-some-gun-proposals-stark-partisan-divisions-on-many-others/

80. Pallant, J. (2016). *SPSS Survival Manual: A Step by Step Guide to Data Analysis Using IBM SPSS, 6th Edn Crows Nest*. NSW: Allen &Unwin.

81. Palma, B. (2019). *Does 'AR' in AR-15 Stand for 'Assault Rifle'? A frequent misconception centers on what the term "AR-15" literally means.* Snopes. Retrieved July 25, 2021, from https://www.snopes.com/fact-check/meaning-of-ar-in-ar-15-firearm/

82. Parker, K., Horowitz, J., Igielnik, R., Oliphant, J.B., & Brown, A. (2017). *America's complex relationship with guns.* Pew Charitable Trust. Retrieved February 15, 2021, from https://www.pewresearch.org/social-trends/2017/06/22/views-on-gun-policy/

83. Pederson J, Hall TL, Foster B, Coates JE. Gun ownership and attitudes toward gun control in older adults: Re-examining self-interest theory. American Journal of Social Science Research. 2015;1(5):273–281. [Google Scholar]

84. Phillips, M. (2021). *How Biden could tighten gun control without congress. Fox News*. Retrieved February 18, 2021, from https://www.foxnews.com/politics/how-could-biden-tighten-gun-control-without-congress-approval

85. Planty, M., & Truman, J. L. (2013). *Firearm violence, 1993–2011*. Washington, DC: US Department of Justice, Office of Justice Programs, Bureau of Justice Statistics.

86. Ramchand, R. & Ayer, L. (2021). *Is mental illness a risk factor for gun violence?* RAND. Retrieved July 25, 2021, from https://www.rand.org/research/gun-policy/analysis/essays/mental-illness-risk-factor-for-gun-violence.html

87. RAND. (2020). *What science tells us about the effects of gun policies*. Retrieved February 18, 2021, from https://www.rand.org/research/gun-policy/key-findings/what-science-tells-

us-about-the-effects-of-gun-policies.html

88. Rosen G. Yes and no to gun control. Commentary. 2000;110(2):47–53. [Google Scholar]

89. Roth, J. A. (1994). *Firearms and violence*. US Department of Justice, Office of Justice Programs, National Institute of Justice.

90. Rowhani-Rahbar A, Lyons VH, Simonetti JA, Azrael D, Miller M. Formal firearm training among adults in the USA: Results of a national survey. Injury Prevention. 2018;24(2):161–165. doi: 10.1136/injuryprev-2017-042352. [DOI] [PubMed] [Google Scholar]

91. Schaeffer, K. (2019). *Share of Americans who favor stricter gun laws has increased since 2017*. Pew Charitable Trust. Retrieved from https://www.pewresearch.org/fact-tank/2019/10/16/share-of-americans-who-favor-stricter-gun-laws-has-increased-since-2017/

92. Schaeffer, K. (2021). *Key facts about Americans and guns*. Pew Charitable Trust. Retrieved July 25, 2021, from https://www.pewresearch.org/fact-tank/2021/05/11/key-facts-about-americans-and-guns/

93. Schmidt, D. (2020). *How many deer hunters in the United States?* Deer and Deer Hunting. Retrieved February 15, 2021, from https://www.deeranddeerhunting.com/content/blogs/dan-schmidt-deer-blog-whitetail-wisdom/how-many-deer-hunters-in-the-united-states

94. Secret PE, Johnson JB. Racial differences in attitudes toward crime control. Journal of Criminal Justice. 1989;17(5):361–375. doi: 10.1016/0047-2352(89)90047-0. [DOI] [Google Scholar]

95. Sen B, Panjamapirom A. State background checks for gun purchase and firearm deaths: An exploratory study. Preventive Medicine. 2012;55(4):346–350. doi: 10.1016/j.ypmed.2012.07.019. [DOI] [PubMed] [Google Scholar]

96. Shammas, M. (2019). It's time to retire the guns don't kill people—People kill people argument. Guns do kill people. *Guns Do Kill People (November 24, 2019)*.

97. Smith J, Spiegler J. Explaining gun deaths: Gun control, mental illness, and policymaking in the American states. Policy Studies Journal. 2020;48(1):235–256. doi: 10.1111/psj.12242. [DOI] [Google Scholar]

98. Southwick L., Jr Self-defense with guns: The consequences. Journal of Criminal Justice. 2000;28(5):351–370. doi: 10.1016/S0047-2352(00)00051-9. [DOI] [Google Scholar]

99. Statista Research Department (2021). *Mass shootings in the U.S.: Legality of shooter's weapons, as of May 2021*. Retrieved July 25, 2021, from https://www.statista.com/statistics/476461/mass-shootings-in-the-us-by-legality-of-shooters-weapons/

100. Swanson JW, McGinty EE, Fazel S, Mays VM. Mental illness and reduction of gun violence and suicide: Bringing epidemiologic research to policy. Annals of Epidemiology. 2015;25(5):366–376. doi: 10.1016/j.annepidem.2014.03.004. [DOI] [PMC free article] [PubMed] [Google Scholar]

101. Tillyer MS, Tillyer R. Violence in context: A multilevel analysis of victim injury in robbery incidents. Justice Quarterly. 2014;31(4):767–791. doi: 10.1080/07418825.2012.696127. [DOI] [Google Scholar]

102. Tyler TR, Lavrakas PJ. Support for gun control: The influence of personal, sociotropic, and ideological concerns. Journal of Applied Social Psychology. 1983;13(5):392–405. doi: 10.1111/j.1559-1816.1983.tb01747.x. [DOI] [Google Scholar]

103. U.S. Fish and Wildlife Services (2020). *National hunting license data.* Retrieved February 15, 2021, from https://www.fws.gov/wsfrprograms/Subpages/LicenseInfo/Natl%20Hunting%20License%20Report%202020.pdf

104. Wallace LN. American preferences for "smart" guns versus traditional weapons: Results from a nationwide survey. Preventive Medicine Reports. 2016;4:11–16. doi: 10.1016/j.pmedr.2016.05.005. [DOI] [PMC free article] [PubMed] [Google Scholar]

105. Winkler A. Is the second amendment becoming irrelevant. Indian Law Journal. 2018;93:253–265. [Google Scholar]

106. Wintersteen. (2018). *9 Common misused gun terms.* Guns and Ammo. Retrieved July 25, 2021, from https://www.gunsandammo.com/editorial/9-misused-gun-terms/249625

107. Wolfgang ME. Patterns in criminal Homicide. University of Pennsylvania Press; 1958. [Google Scholar]

108. Wozniak KH. Public opinion about gun control post-Sandy Hook. Criminal Justice Policy Review. 2017;28(3):255–278. doi: 10.1177/0887403415577192. [DOI] [Google Scholar]

109. Wright MA, Wintemute GJ, Rivara FP. Effectiveness of denial of handgun purchase to persons believed to be at high risk for firearm violence. American Journal of Public Health.

1999;89(1):88–90. doi: 10.2105/AJPH.89.1.88. [DOI] [PMC free article] [PubMed] [Google Scholar]

110. Yablon, A. (2020). *Internet gun sales and background checks, explained*. The Trace. Retrieved July 25, 2021, from https://www.thetrace.org/2016/01/internet-gun-sales-background-checks/

Associated Data

This section collects any data citations, data availability statements, or supplementary materials included in this article.

Supplementary Materials

Supplementary file1 (DOCX 45.8 kb) (45.8KB, docx)