Walden University

College of Health Sciences and Public Policy

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Jessica Vester

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Walden University
2023

Abstract

Gun Violence: An Examination of Alabama's Open Carry Gun Law

By

Jessica Vester

MS, Troy University, 2013

BS, University of Alabama at Birmingham, 2007

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Policy and Administration

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November 2023

Abstract

Researchers do not know to what extent Alabama's open carry law has affected the number of gun deaths in Alabama. The purpose of this quantitative study was to provide an enhancement to the existing body of information related to firearm deaths by providing a statistically-based perspective of the open carry statute in the five most populated Alabama counties of Jefferson, Madison, Mobile, Montgomery, and Shelby. The research questions focused on the potential difference in overall number of gun-related deaths after Alabama's open carry law implementation. Using Beccaria's rational choice theory, an independent samples *t* test and linear regression models were used to examine effects on firearm-related mortality rates and gun-related death classifications (homicide, suicide, accidental, and legal intervention) using pre- and post-open carry public health data. Firearm-related death criterion sampling was used from the Alabama Department of Public Health Center for Health Statistics database between 2007 and 2019. A statistically significant rise in overall gun related deaths (M_{diff} -8.120; p = .0001) was observed during the open carry legislative period. Male, White, or Black characteristics remained unchanged. Demographically, age and homicide death classifications differed from pre-open carry time periods significantly, contributing to model variances. Being female of any race or age was not a significant predictor during either period. This study creates positive social change by providing Alabama policymakers information when evaluating the effects of this 2013 open carry legislative change on gun-related violence, noting that liberalization of open gun carry legislation has had a detrimental social effect and is worthy of further policy evaluation.

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Dedication

First, I dedicate this dissertation to God, if it was not for him, I would not be here. This dissertation is dedicated to my caring, loving, and extremely supportive mother who instilled in me a strength and dedication that I never knew was possible. I also dedicate this dissertation to my network of family and friends who encouraged me and reminded me to try and focus on the light at the end of this extremely long tunnel. Ultimately, this dissertation is dedicated to all of those individuals who have been affected by gun violence. I hope that my research study can serve as a foundational stepping stone in gun control literature that will enlighten others of the realities of the open carry gun law and how it affects others.

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First and foremost, I must thank God for blessing me during my entire dissertation journey. This journey is definitely not for the faint of heart. There were plenty of times when I doubted and questioned by academic prowess, but thankfully I was blessed with a number of wonderful individuals placed in my life that have helped me immensely along the way.

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Chapter 1: Introduction to the Study

Gun ownership has dramatically increased, with Americans owning more firearms than any other country. Since the global Coronavirus outbreak, firearm sales in the United States have increased by 64% in 2020 compared to 2019 (Hill et al., 2022). Guns endanger public health; gun violence has become an important issue as well as a focus of social justice. According to Z. K. Jones (2019), "The presence of firearms increases the risk of serious injury or death in conflict situations" (p. 5). Dominant acts of firearm violence include homicide, suicide, unintentional or accidental injury, and robbery. Gun lobbyists have influenced gun policy; therefore, firearm regulation is one of the more contentious issues in today's political realm. Many Americans are divided over gun control, with public opinion often influenced by political parties and elected officials. Individual perspectives regarding gun control may often depend on their political party affiliation (Molina, 2021).

The number of violent gun deaths and mass shooting events in the United States has steadily risen (Federal Bureau of Investigation, 2019, 2022). Public concern over firearm deaths is also on the rise; gun deaths have increased in the United States, with nearly 40,000 people dying from gunshot wounds in 2017 (Howard, 2018). According to the Centers for Disease Control and Prevention (CDC; 2018), the firearm death rate for Alabama in 2017 was 22.9 per 100,000, making the state the second highest in firearm deaths behind Alaska, with a rate of 24.5. The Educational Fund to Stop Gun Violence (2020) reported that firearm mortality rates have increased in Alabama. In 2019, at least three people died daily from firearms in the state (Educational Fund to Stop Gun

Violence, 2020). The Federal Bureau of Investigation (2019) reported that 73.7% of murders (per 100,000) committed nationwide involved firearms.

Firearm deaths include different forms of gun violence, such as mass shootings, shootings involving police officers, domestic violence, and incidences involving community violence. For this reason, gun policies are required to address the varying types of firearm homicides. Restriction to gun access is needed to reduce firearm deaths (Educational Fund to Stop Gun Violence, 2021; Iwama & McDevitt, 2021). Gun law debates have also increased as more individuals gain access to firearms. Gun control policies are typically designed to reduce gun crimes and violence. Generally, states with weaker, less stringent gun laws and higher rates of gun ownership tend to have higher levels of firearm violence and firearm deaths (Bilgel, 2020). Alabama is a shall issue state regarding concealed weapons permits (Giffords Law Center, 2022a). If citizens pass primary state law requirements, the local sheriff's office is obligated to issue a concealed weapons permit. Also, if they purchase a handgun from a private seller, no background check, registration, or permit is mandatory for acquisition.

On August 1, 2013, the state of Alabama implemented an open carry gun law that allows individuals to legally possess and carry firearms in public without a permit or license (Disorderly Conduct, 1975/2013). Any individual over the age of 18 who can legally possess a firearm can openly carry it in public. Public places, such as courthouses and schools, are gun-free zones, and regardless of the open carry law, no firearms are allowed on the property (Possession of Firearms in Certain Places, 1975/2022). Before the 2013 law change, no one could carry a firearm in their vehicle or on their person

without a license (Permit to Carry Pistol in Vehicle or Concealed on Person, 1975/2013). Pre-open carry rules also required that all firearm dealers be licensed regardless of how the firearm was purchased (Dealers' Licenses—Required, 1975). Researchers do not know to what extent the open carry law has affected gun deaths in Alabama. Bringing attention to gun policies may promote positive social change by helping to create a dialogue regarding development of stricter firearm policies to better help combat the problem of gun violence.

This chapter includes the background of this study, a statement of the problem, and its purpose. The research questions (RQs) and hypotheses, theoretical framework, and nature of the study are discussed. I also provide definitions of key terms and list assumptions. Finally, I outline the study's scope and delimitations, limitations, and significance of this study.

Background of the Problem

The increasing number of violent crimes involving guns is a public health issue. Boehme, Kaminski, and Leasure (2022) noted firearm violence is one of the primary causes of death in the United States, which affects large numbers of minorities. Gun violence is a problem in communities throughout the country. Gun control is a highly debated subject; however, it is critical to decreasing gun violence (Bilgel, 2020). Gun control laws date back to the creation of the Second Amendment of the U.S. Constitution, which grants individuals the right to keep and bear arms (U.S. Const. amend. II). Because of lax firearm policies and the combination of increased gun ownership and availability

of firearms, the United States now leads the world in mass shootings (Cook, 2018, 2020; Iwama & McDevitt, 2021; Light & Slonimerov, 2020; Luca et al., 2019; Wu, 2022).

Firearm violence and firearm deaths affect several different areas nationwide. Literature on firearm violence and gun deaths is widespread. Researchers have explored gun violence and deaths from a financial standpoint, focusing on how it has affected the health care industry (Dobaria et al., 2020). According to Dobaria et al. (2020), "Gun violence remains a major burden on the U.S. health care system, with annual costs exceeding $170 billion" (p. 448). There have also been studies involving the media and how reporting influences gun violence (Kaufman et al., 2020). Similar to my study, Research has also been conducted on gun violence, examining state gun laws in relation to firearm mortality rates (Chien & Gakh, 2020). Many firearm policy researchers have investigated regions, countries, states, and local municipalities that have firm gun laws, noting their liberality or restrictions regarding gun control (Chien & Gakh, 2020; Degli Esposti et al., 2022; Liu et al., 2020; Onwuka, 2020).

Although there is prolific literature regarding gun violence, there is an information gap concerning specific gun legislation in relationship to firearm mortality rates for individual states, namely Alabama, in the pre and post open carry legislative eras. Therefore, investigating gun laws and their influence on firearm-related deaths was paramount. This study provides an examination of the relationship between firearm mortality and firearm legislation in Alabama, a state that transitioned to open carry in 2013.

Problem Statement

The Second Amendment gives individuals the right to bear arms. The debate over gun control, while ever-present, emerges with passion each time there is a shooting event in public, especially when casualties are involved. The mass shootings that occurred at Robb Elementary School (Uvalde, Texas), Tops Friendly Market (Buffalo, New York), Warren Clinic (Tulsa, Oklahoma), Marjory Stoneman Douglas High School (Parkland, Florida), Pulse nightclub (Orlando, Florida), and Sandy Hook Elementary School (Newton, Connecticut) have all resulted in reigniting the gun control debate. Researchers do not know what extent the open carry law has had on gun deaths in Alabama. This problem impacts all individuals who reside in the state because firearm-related deaths affect society as a whole. In 2013, the state of Alabama implemented an open carry gun law that allows individuals to legally possess and carry guns in public without a permit or license (Disorderly Conduct, 1975/2013). According to CDC (2018) data, in 2014, Alabama ranked fourth in gun deaths out of all 50 states but moved to second place in 2016.

Firearm deaths are a public health issue that demands a public health resolution (Educational Fund to Stop Gun Violence, 2018; Rivara et al., 2018). However, there has been minimal research on the impact of gun deaths within a single state that has implemented an open carry statute (Manski & Pepper, 2018). Because Alabama became an open carry state in 2013, sufficient time has passed for a comparative analysis of firearm mortality rates. My study's findings contributed to the literature by providing

policymakers with information to consider as new gun laws are created and current laws are revised.

Purpose of the Study

The purpose of this quantitative study was to provide an enhancement to the existing body of information related to firearm deaths by providing a statistically-based perspective of the open carry statute in the five most populated Alabama counties of Jefferson, Madison, Mobile, Montgomery, and Shelby. In this study, I used an independent samples *t* test and linear regression analyses to explore whether a statistically significant relationship existed regarding both gun-related death rates and gun-related death classifications 6 years before and after the 2013 open carry gun law implementation. For the regression models, the independent variables (IVs) were the gun-related death classifications of homicide, suicide, accidental, and legal intervention. The dependent variables (DVs) were the rates of Alabama gun-related deaths during both timeframes. Age, gender, and race were used as covariates for the regression analyses. This study helped close the gap in the literature by providing an examination of whether there was a significant correlation between the open carry law and firearm deaths in Alabama. The findings of my study can help policymakers create more stringent gun laws to aid in the reduction of firearm deaths.

Research Questions and Hypotheses

RQ1: Based on reported gun-related death rates prior to Alabama's open carry law of August 1, 2013, is there a statistically significant difference in the overall number

of gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby after Alabama's open carry law implementation?

$H_0$1: The number of gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby are not significantly different between 2007 precarry status and post-2013 open carry law implementation.

H_a1: The number of gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby are significantly different between the 2007 precarry status post-2013 open carry law implementation.

RQ2: Using the Alabama Department of Public Health Center for Health Statistics (ADPHCHS) database for 2007–2019, which pre-2013 gender and race, age distribution, and gun-related death classifications (homicide, suicide, accidental, and legal intervention) predictor illustrated significant R^2 variance in gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby?

$H_0$2: There are no gender and race, age distribution, and gun-related death classifications (homicide, suicide, accidental, and legal intervention) in the pre-2013 timeframe that illustrated significant R^2 variance in gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby.

H_a2: There are gender and race, age distribution, and gun-related death classifications (homicide, suicide, accidental, and legal intervention) in the pre-2013 timeframe that illustrated significant R^2 variance in gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby.

RQ3: Using the ADPHCHS database for 2007–2019, which post-2013 gender and race, age distribution, and gun-related death classifications (homicide, suicide, accidental, and legal intervention) illustrated significant R^2 variance in gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby?

$H_0$3: There are no gender and race, age distribution, and gun-related death classifications (homicide, suicide, accidental, and legal intervention) in the post-2013 timeframe that illustrated significant R^2 variance in gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby.

H_a3: There are gender and race, age distribution, and gun-related death classifications (homicide, suicide, accidental, and legal intervention) in the post-2013 timeframe that illustrated significant R^2 variance in gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby.

Theoretical Framework

The study's theoretical framework was Beccaria's (1764/1963) rational choice theory. Beccaria's theory is rooted in the classical school of thought that free will is the driving force of human decision making. Rational choice theory helps researchers better understand society when examining the behaviors of individuals on a personal level (Thomas et al., 2022). This theory has been used in many criminological studies to assert that individuals conduct cost-benefit analyses involving decisions and, in turn, make rational choices regarding their behaviors. Within criminology, this theory has been used for understanding various types of delinquent acts (Gül, 2009). Rational choice theory

was appropriate to use in the discussion of firearms to explain the motivation behind the performed action—either carrying or discharging a firearm.

Gül (2009) noted the foundation of the rational choice perspective is that individuals choose to participate in criminal activities due to profit or gain. Therefore, using a firearm can be considered a personal decision and should be examined on a personal level. The open carry law in Alabama gives individuals the freedom to decide whether they would like to carry a firearm or not, which matches with the free choice premise of rational choice theory.

Nature of the Study

This study involved using a nonexperimental inferential quantitative research design with parametric statistics. This research approach allowed examination of the differences between two or more variables through statistical data analysis. Additionally, correlational research in the form of regression modeling was used to measure statistical relationships between variables and determine their strengths. For this study, secondary data were the most appropriate source of information to answer the RQs. When data sources are reliable, secondary data allows for easier study replication (Bokhove, 2022).

The chosen population for this study were individuals residing in the Alabama counties of Jefferson, Madison, Mobile, Montgomery, and Shelby and data reported to the ADPHCHS from 2007–2019 for those whose deaths were caused by a firearm categorized by homicide, suicide, accidental, and legal intervention. With such a large sample size (Time Period 1 = 2291 cases; Time Period 2 = 2872 cases), the alpha level chosen was 0.05, with a significance level of 95%. For this study, data from pre- and

postcarry years assisted in examining differences in overall gun-related deaths. Additionally, data from both periods were used for linear regression modeling to address actual and predicted gun-related deaths according to classification category. Regression models also allowed for examination of age as well as race and gender. I used a criterion sampling method in conjunction with independent samples *t* tests and linear regression analyses to determine whether the open carry law in Alabama had a statistically significant effect on gun deaths. Statistical Package for the Social Sciences (SPSS) Version 28 software was used for data analyses.

Definitions

Age: Participants' age as reported at the time of their death as indicated in the ADPHCHS database.

ADPHCHS database: This source contains all firearm death totals, age, race, gender, and population information for 2007–2019. This database obtains information from certificates and reports documented with the Center for Health Statistics located within the Alabama Department of Public Health. Firearm mortality information is taken from death certificates filed with the Center for Health Statistics (ADPHCHS, n.d.-a, n.d.-b, n.d.-c, n.d.-d, n.d.-e, n.d.-f, n.d.-g, n.d.-h, n.d.-i, n.d.-j, 2010, 2013, 2015, 2021).

Firearm deaths: Homicide, suicide, accidental, and legal intervention deaths involving firearms.

Gender: Participants' gender as indicated in the ADPHCHS database as male or female.

Legal intervention: Firearm death at the hands of a law enforcement officer.

Post open carry: Firearm deaths in Alabama after August 1, 2013, for the years of 2014-2019.

Pre-open carry: Firearm deaths in Alabama before August 1, 2013, for the years 2007-2012.

Race: Participants' race as indicated in the ADPHCHS database as Black, White, or Other.

Time Period 1: Firearm deaths in Alabama before August 1, 2013, for the years 2007–2012.

Time Period 2: Firearm deaths in Alabama after August 1, 2013, for the years 2014–2019.

Assumptions

An assumption for this study was that all information obtained from the ADPHCHS database was accurate and consistent. Another assumption was that the Alabama counties of Jefferson, Madison, Mobile, Montgomery and Shelby all reported data in the same consistent manner. I also assumed all health care providers, funeral directors, and coroners reported causes of death as indicated on certificates as accurately as possible. These assumptions were necessary for this study as they helped provide additional creditability and validity.

Scope and Delimitations

The study concerned gun-related deaths and the open carry law in Alabama. Gun death rates were examined by specified categories, such as homicide, accidental, legal intervention deaths involving a firearm, and suicide. The date range for data collected for

this study was 2007–2019, or 6 years before and 6 years after the 2013 implementation of Alabama's open carry law. Alabama has 67 counties with varying numbers of residents. The selected sample for this study was delimited to only include only Jefferson, Madison, Mobile, Montgomery, and Shelby counties. These counties were selected because their population during the study's timeframe was over 200,000 residents. Data from counties with populations less than 200,000 were not used. I selected gun deaths in Alabama to examine whether a statistical difference in gun deaths existed between the two timeframes, and if so, then policymakers can begin the process of analyzing gun policies to determine whether stricter gun guidelines should be created to help decrease firearm deaths.

Limitations

This study had potential methodological limitations. These limitations included the way in which categories were classified, the potential for underreporting cases, and overuse of the legal intervention classification as a catch-all data submission point. Classifying categories in an unclear manner could have limited study results. The underreporting of cases could also have provided inaccurate statistical analysis results. Overuse or misuse of the legal intervention classification could have impacted accurate representation of gun-related causes of death by providing misleading death rates for this category. This limitation had the potential to lead to inaccurate firearm related death classifications. Another limitation was the exclusion of firearm permits and hunting licenses from database-reported deaths. Also, race classification data collected in the ADPHCHS may not have been completely accurate. Another limitation involved the

default racial categorization used in the ADPHCHS database. For this secondary data, when the race of an individual resident was unknown, that particular mortality count was placed in the category of Black. Default category placement practices such as this could give the appearance that racial data was biased (ADPHCHS, n.d.-a, n.d.-b, n.d.-c, n.d.-d, n.d.-e, n.d.-f, n.d.-g, n.d.-h, n.d.-i, n.d.-j, 2010, 2013, 2015, 2021). Gun deaths in the database were not specifically categorized by distinguishing characteristics such as age or race, which could have led to a lack of information about the effects of gun law legislation on certain demographics. A final limitation pertains to who reports the death. Although an individual had a gunshot wound at the time of their death, this does not automatically mean their death was due to the firearm. Therefore, it is important that skilled professionals report deaths. This could have limited the study due to inaccurate reporting of a firearm-related death.

Significance

A significant number of individuals are negatively affected by some form of gun violence each day. According to the Brady Campaign to Prevent Gun Violence (2015), over 300 people in the United States are affected daily by firearms, including assault, homicide, suicide and attempted suicide, accidental shooting, and police-involved incidents. For this reason, it was important to conduct further gun law research to determine whether some laws have added to, taken from, or did not affect firearm mortality rates. It was also essential to examine current gun laws that have contributed to the increasing number of gun deaths in Alabama. My research results added to the growing literature by providing information that may influence gun policy changes,

which can contribute to firearm prevention policies in Alabama. My study added to the body of knowledge and may lead to social change by helping to increase societal awareness of the significant impact of the open carry law on firearm mortality rates in Alabama.

Summary

This study on firearm mortality and gun legislation was designed to help determine whether the specific open carry firearm law in Alabama has had a noteworthy effect on gun death rates in Alabama. Gun violence is a complex issue that must be met with a range of solutions. This chapter included an introduction to the phenomenon of gun-related deaths in Alabama. Beccaria's (1764/1963) rational choice theory grounded this study and was used to view and understand how some Alabamians chose to behave and provided a platform for policy interpretation. This nonexperimental inferential quantitative study was focused on the open carry gun law and its effect on gun deaths in Alabama. Types of gun deaths that were examined were homicide, suicide, accidental, and legal intervention deaths involving firearms. Instances of gun violence may lead to public terror; therefore, it is imperative that firearm policies are strategically examined to provide improved strategies for the prevention of firearm deaths. Chapter 2 includes the literature search strategy, theoretical framework, and a review of related and relevant firearm literature.

Chapter 2: Literature Review

Researchers do not know to what extent the open carry law has affected gun deaths in Alabama. The purpose of this quantitative study was to provide an enhancement to the existing body of information related to firearm deaths by providing a statistically-based perspective of the open carry statute in the five most populated Alabama counties of Jefferson, Madison, Mobile, Montgomery, and Shelby. Investigating the change in Alabama's gun carry law using gun death classifications helped illuminate factors related to this policy change.

Firearm violence is an increasing problem in society and considered a public health issue that demands a public health resolution (Educational Fund to Stop Gun Violence, 2018; Rivara et al., 2018). Firearm incidences have become an economic burden as well. When a firearm injures a person, medical intervention is often required for a complete and healthy recovery (Dobaria et al., 2020). Many gun laws have been created to address this public concern.

According to Hellenbach et al. (2018), public access to firearms should be restricted. For this reason, gun law implementation is pertinent. However, some states have gun statutes that seem to add to the gun violence problem. For example, Alabama is an open carry state in which individuals can openly carry firearms in public without a license or permit. Lenient gun policies like this seem to encourage firearm possession and promote gun rights; however, they lack the appropriate restrictive and punitive measures required for better gun control (Fleming et al., 2018). Previous research has demonstrated that the more individuals have access to firearms, the greater the risk for gun violence

(Semenza et al., 2020). The results of this study offer lawmakers a more realistic view of gun death rates in relation to the open carry statute. My study helped to determine whether there is a relationship between firearm-related deaths and the open carry gun statute in Alabama. In the following sections, I discuss literature search strategies, the theoretical foundation, and literature regarding key variables and concepts.

Literature Search Strategy

I obtained literature applicable to firearm violence, open carry laws, gun deaths, and associated state regulations through Walden University Library's online journal databases, the CDC firearm statistics and online journal databases, as well as other online journals and governmental websites The subsequent search engines and library databases were also used: Google, Google Scholar, Taylor and Francis Online, Science Direct, SAGE Journals, Academic Search Complete, and Criminal Justice Database. I used the following key search terms and combinations to identify related literature: *firearm violence*, *gun violence*, *gun violence statistics*, *gun control*, *open carry laws*, *gun crimes*, *gun deaths*, *gun death rates*, *gun laws*, *Alabama gun laws*, *gun crimes and statistics*, *gun injury*, *gun violence prevention*, and *firearm prevention*. I searched for sources published between 2007 and 2019.

Theoretical Foundation

The theoretical framework is one of the most important aspects of dissertation research. "The theoretical framework is the foundation from which all knowledge is constructed (metaphorically and literally) for a research study" (Grant & Osanloo, 2014, p. 12). Theories serve as conductors for the development of the research process as well

as govern and guide many study decisions, such as research design and analysis, and work to explain the researchers' findings (Grant & Osanloo, 2014). Criminological theories could have been used as the basis for this study on Alabama's open carry gun statute as it related to gun mortality. Social control theory, social learning theory, stigma theory, and self-control theory could have also been employed to explain certain human behaviors regarding gun mortality. However, the theoretical framework chosen for this study was Beccaria's (1764/1963) rational choice theory.

Rational choice theory is used by social scientists to understand anthropological actions (Gül, 2009). For this reason, the study of human behavior and humankind directly relates to Beccaria's (1764/1963) rational choice theory. In 1764, Beccaria purported that all individuals have free will and therefore have the innate ability to make rational choices, deciding whether to participate in unlawful activities or not (Pratt, 2008). The harsher the penalties for crimes, the more crime should decrease (Beccaria, 1764/1963). In other words, individuals living in a free society decide to engage in an unspoken social contract among themselves to behave in a specific manner, and if any rule is broken, rulebreakers are subject to appropriate sanctions (Hayward, 2007). People generally act based on self-interest (Fumagalli, 2021; Lovett, 2006). Secondary data from the ADPHCHS database involving gun-related deaths pre and post open carry legislation was interpreted using a rational choice theoretical lens to search for changes in firearm use and related firearm deaths as a proxy for individual decision-making choices.

There are several noteworthy propositions related to rational choice theory. This theory reflects the school of thought that acts of criminality involve a mental decision.

One of Beccaria's principal theoretical ideals was that the punishment should be equal to the crime (Arsovska & Kostakos, 2008). For this reason, individuals perform cost-benefit analyses, taking into consideration that the punishment for the crime will exceed any possible reward. The cost-benefit precept is fundamental to the rational choice theory.

One of the central tenets of rational choice theory is that individuals adhere to certain behaviors and actions based on the preconception that the action will satisfy their desires as opposed to completing an action and not knowing whether the possible outcome will be beneficial or not (Dietrich & List, 2013). Although rational choice analysis works better at a communal level rather than at the individual level, it is still an appropriate measure of behavioral analysis (Hechter, 1994). A central theme of this theory is the individualistic component, which allows for focus on individual action (Neal, 1988). Although the individual aspect may be a primary precept of the theory, it is also a main assumption. Rational choice theory works on the assumption that individuals are primarily focused on themselves and, therefore, only participate in actions that would benefit them the most or provide the greatest gain. The crux of this theory is the supposition that the criminals or would-be criminals are goal seekers and operate with some level of rationality, with little to no impulsiveness (Gül, 2009).

Rational choice theory has been used in several areas, including gun control debates, individuals who have access to guns, and societal exposure to gun violence. Rourke (2017) used rational choice theory when investigating terrorism and its connection to individuals who perform mental calculations to obtain their anticipated results. A fundamental principle of terrorism is that terrorists exhibit rational decision-

making skills. Whenever a decision is made, it is carefully thought out to achieve the maximum benefit for the appropriate amount of effort expended. Rourke posited that structural causes play a part in utilization of the theory; however, external factors also come into play. When analyzing human behavior and decision making, researchers often use rational choice theory as it was designed to help examine the nature and driving force behind why individuals choose to do the things they do (Rourke, 2017; Runkle, 2016).

In criminal justice, rational choice theory had been used to focus on situational crime prevention strategies (Hayward, 2007). Situational crime prevention is a criminological viewpoint that, unlike most theories that concentrate on penalties or the rehabilitation of lawbreakers, primarily focuses on decreasing the number of criminal opportunities. The emphasis is placed on the environment where the crime occurred rather than on the criminal act itself.

Gun control laws regulate the use of firearms and can be viewed as promoting a collective communal good to expand public safety and diminish instances of firearm violence. According to researchers, firearm regulations work in reducing gun crimes (Cook, 2018; Jang, 2019). Several studies have validated the use of rational control theory in firearm violence and gun control studies. Fleming et al. (2018) examined the gun control debate and stated that the collective action of gun laws is grounded in the rational choice theory. J. G. Carter and Binder (2018) conducted a study on concealed weapons and used rational choice theory for the theoretical framework. The researchers posited that crime should be deterred as gun ownership increases. Fear of potential gun

violence acts as a deterrent because individuals are not aware of whether others are armed (J. G. Carter & Binder, 2018).

In many criminological studies, rational choice theory has been used to show that individuals conduct a cost-benefit analysis of a decision to act and have made a rational choice about their behavior. Also, in criminology, this theory provides a basic outline for understanding various types of delinquent acts (Gül, 2009). Rational choice theory is one of the more appropriate theories to use in discussing firearms because it helps explain a person's motivation behind their actions to carry or discharge a firearm. Gül (2009) pointed out that the foundation of rational choice theory is that individuals choose to participate in many criminal activities due to profit or gain. Therefore, using a firearm can be considered a cognitive conclusion and should be examined on an individual level. Also, this theory has worked to advance scholarly thinking to guide researchers toward discovering the numerous possible circumstances in which sanctions may become more useful in preventing unlawful behavior (Pratt, 2008).

Rational choice theory has helped to establish the assumption that criminal conduct is a cognitive choice and consequently can be prevented with the risk of an adverse consequence (Beccaria, 2009). Several studies using rational choice theory have focused on collective action (Denzin, 1990; Dowding & Hindmoor, 1997; Fleming et al., 2018; Hechter & Friedman, 1983; Hudik, 2019). Gun policies have a wide range that reaches society as a whole. This theory was suitable because it can be used to examine both individual and societal levels.

Rational choice theory was selected for this study because it helped to provide a better understanding of the reasons why some individuals choose to behave in specific ways. This theory was also conducive to the discussion of firearm violence. It helps explain the individual motivational level concerning the unlawful use of guns. Ryan and Gallupe (2020) asserted that a large amount of literature that involves rational choice theory has focused on property crime. However, rational choice theory was an appropriate fit for this study because although a cost-benefit analysis is conducted by the individual, this theory maintains that "decisions are often made under conditions of limited rationality since it is generally not possible to have access to all relevant information necessary to make the best possible decision" (Ryan & Gallupe, 2020, p. 3). Due to the open carry law in Alabama, some individuals choose to decide to carry a firearm based on a limited rationale. In other words, individuals choose to make the rational decision to carry a gun regardless of any possible mitigating factors (Carson et al., 2019; Fumagalli, 2020, 2021; Rutar, 2019; Thomas et al., 2020). Among rational choice research that applies to this firearm study, the overall consensus has been that individuals who choose to participate in open carry have made the rational decision to do so. The decision to possess a firearm is typically made for self-preservation while at the same time providing the most satisfactory benefit for the individual (Ryan & Gallupe, 2020).

Literature Review Related to Key Variables and Concepts

Firearm mortality and injury are key public health worries that continue to besiege many communities across the United States. Throughout the years, there have been

numerous incidents involving firearm deaths and injuries that have been publicized by the media as well as others that have occurred out of the spotlight. Gun mortality is a subject that has been viewed from various angles. Some studies have credited episodes of gun violence to lenient gun laws, while several other studies have addressed gun violence from other aspects. Most of the research on this topic has been qualitative (Clark, 2017; Hodges, 2017; Ndikum, 2018), and the majority of these studies focused on how gun violence has impacted individuals. Quantitative studies, however, have included statistical data involving a specific type of gun violence or gun policy and the corresponding demographics of the area (Bailey, 2011; Chandler, 2018; Chien & Gakh, 2020; Cox, 2016; Gius, 2018; Liu et al., 2020).

The Second Amendment to the United States Constitution grants citizens the right to bear arms. Although this right exists, there have been constant debates over the best way to regulate firearms. Therefore, strategic analyses of gun laws are required to help evaluate the effectiveness of gun policies. Liu et al. (2020) conducted an observational study that assessed the statistical relationship between state gun laws and firearm deaths to determine whether the weaker laws of neighboring states had a statistical effect on other states' gun death rates. Liu et al. examined the in-state gun policies of the 48 contiguous states and gun-related mortality data reports from those states from 2000-2017. Statistical analysis was conducted using negative binomial regression models with fixed effects for the state and year. During the study period, there were a total of 578,022 documented firearm deaths. Along with a large amount of previous literature, Liu et al. found that states with very restrictive firearm policies experienced fewer firearm deaths.

One of the primary challenges with passing gun control legislation is that firearm regulations and policies vary from state to state. Siegel et al. (2019) conducted a comparable firearm study in which they evaluated the relationship between state gun laws and homicide and suicide rates for all 50 states during 1991–2016. This quantitative study used fixed effects with a multivariable regression model for analysis. A total of 10 state firearm laws were analyzed. Over the 26 years, 93 gun law changes occurred among the laws examined. A significant variation in firearm mortality rates across all 50 states was recorded. States with shall issue gun and permit-less carry laws had statistically significant higher firearm mortality rates (9.0% [CI 95%]), demonstrating a link to higher homicide rates. However, no consistent or significant relationship was found between suicide and the gun laws studied.

Chien and Gakh (2020) performed a similar quantitative study examining the connection between firearm policies and firearm mortality levels in the United States from 1999–2017. Data for this longitudinal study comprised an analysis of yearly firearm homicide deaths and existing state firearm laws in the 50 states from 1999–2017. To obtain the yearly homicide firearm death rates, Chien and Gakh used data from the CDC's Wide-Ranging Online Data for Epidemiologic Research. They conducted an advanced data inquiry for the states with less than 10 cases. This involved using information from a state with limited data and a state with normal data and calculating the limited data from the combined data through subtraction. Unlike firearm mortality rates, firearm policy information was obtained from the State Firearm Law Database. This database catalogs 134 gun law variables at the state level in annual intervals for all

50 states. Only specific state firearm regulations were reviewed and categorized into select groups.

Chien and Gakh (2020) analyzed the data by counting the number of gun laws in each state. The researchers analyzed current firearm laws from all 50 states, unlike previous studies that only examined individual gun laws. They hypothesized that the more gun laws states had in place and the more stringent their regulations, the more likelihood that firearm mortality would decrease. Chien and Gakh concluded that firearm homicide rates were affected by existing state firearm laws. Their study also demonstrated that despite the type or number of gun laws a state had in place, there was an average 7-year lag before there was a decrease in firearm homicide rates.

Onwuka (2020) examined the relationship between gun violence restraining orders and violent crime reduction rates in California through secondary data from the California Department of Justice. Enacted in 2014, a gun violence restraining order is an order issued by a court that bans someone from possessing firearms, magazines, or ammunition (Onwuka, 2020). Onwuka's quantitative study was quasi-experimental with an independent samples *t* test, one-way analysis of variance, and a simple linear regression model. The IV was the year studied; the DV was the gun violence restraining order. The purposive sampling dataset source was the California Department of Justice. This dataset assisted the researcher in gaining a better grasp of the impact of the various types of gun violence restraining orders for the specified years of study, 2016–2019. Onwuka found an increase in violent crime where firearms were used in the commission of the offense throughout California, which caused widespread public concern. Several

critics have argued that California gun laws are mainly nonrestrictive, and this has caused violent gun crimes to steadily increase throughout the years. California has been working on implementing various policy reforms and gun laws to decrease firearm violence rates. One strategy was gun violence restraining orders. The results of Onwuika's study indicated there was a statistical significance, and gun violence rates were affected by gun violence restraining orders.

Watts (2019) contributed to the gun literature by determining whether a statistically significant relationship existed between gun carrying and gun victimization. The routine activities theory was used as the framework to ground the study. This theory allows carrying a firearm to be viewed as either risky or for protection. Data were procured from the National Longitudinal Study of Adolescent to Adult Health; the sample included US adolescents in Grades 7–12. Eighty public and private high schools and 52 middle schools throughout the country had varying demographics and ethnicities for a more inclusive study sample. The data were used to investigate whether gun carrying adolescents were more prone to victimization. Two logistic regression tests were performed. The first involved the direct analysis of gun carrying and gun victimization. The second applied other control variables to determine if other potential risk factors would have noteworthy effects on gun carrying and victimization. Data were limited as the focus was on violent victimization and not centralized to victimization incidences involving firearms. A strength of this approach was that the data were from a sample that provided a national representation of society with parameters accounting for risky

behavior. Watts found a statistically significant relationship between carrying a firearm and becoming a victim of gun violence.

In the aftermath of firearm incidences, gun control laws have become a significant topic of debate. Although gun laws such as open carry were in place before the violence occurred, those laws come under scrutiny and are blamed for providing individuals with access to the weapon used in the event. In response, several researchers have concentrated on the emotional impact of gun violence (Clark, 2017; Hodges, 2017; Jang, 2019; Ndikum, 2018). There have also been several studies conducted on gun violence with a consensus that it has increased because more individuals are openly carrying firearms or have easier access to them (Blau et al., 2016; Butterworth & Anestis, 2019; Hoskin, 2011; Husak, 2019; Watts, 2019).

Blau et al. (2016) studied public shootings and whether a correlation existed between these incidences and gun laws. When public or mass shootings occur, the public outcry for more stringent gun regulations and legislation becomes louder. However, according to Blau et al., “Little is known about the effect of existing regulations on public shooting outcomes” (p. 4732). This study was designed to assist policymakers in creating improved firearm regulations to prevent future gun violence events. Gun laws and other mitigating factors, such as mental illness, were included as study variables. As purported in the study, policymakers have wide-ranging opinions on gun regulations and their societal impact. Some believe that stricter gun laws are needed to deter gun violence. Conversely, others believe that regardless of any gun law, people will still own guns and proceed however they deem fit. Gun laws that focus on the restriction of assault style

weapons (e.g., Federal Assault Weapons Ban) were studied to determine their effect on public shootings. Blau et al. examined cross-sectional data, with the results indicating that firearm regulations restricting assault weapons had no impact or effect on using these weapons during public shooting events. Blau et al. noted that a study weakness might have been the number of coefficients or covariates used in their regression modeling.

Researchers have studied gun laws, policies, regulations, and procedures in several ways; however, studies concerning open carry laws are limited. Research involving open carry laws often includes interviews or surveys. Open carry is the act of openly carrying a firearm in visible public view. In contrast, concealed carry is the action of carrying a gun in public, but the weapon is concealed or hidden from view. Although many states still require permits to carry weapons in public, several have relaxed gun laws and allow open carry. According to the Giffords Law Center (2022b), open carry jeopardizes the public's safety by increasing the potential risk of violence.

Wallace (2019) examined individuals' perceptions of open carry laws using an online nationwide survey to determine how safe people felt in various environments actively witnessing someone engaging in open carry. Wallace also examined the perceptions of individuals in those same environments who did not know whether a person had a firearm on their person or not. The study's findings supported the supposition that gun owners would feel comfortable around individuals openly carrying a firearm in public, whereas nongun owners did not possess the same feelings of safety. Wallace ascertained that the individuals were not comfortable in open carry situations and felt even more unsafe when the person participating in open carry was a stranger.

Also, a majority of the respondents felt safer when gun owners were White and had higher education levels. One of the primary study weaknesses was that the researcher could not guarantee the truthfulness of every respondent's survey answers. The strengths of this approach are that it worked to provide viewpoints of how some Americans felt about open carry and added to the literature in this area.

Open carry laws were enacted to increase public safety due to an increase in concealed weapons (Wallace, 2019). Firearms have become a more common part of American society, providing many individuals with an increasing sense of safety and protection. Wallace (2019) discussed the significance of attaining a more comprehensive knowledge base regarding gun carrying and gun use activities in the United States by examining the open carry law. Open carry is not a well-known concept in the literature on gun control. Typically, when gun control is discussed, the initial focus is on mental illness. This is why more studies need to address other aspects of the gun control debate, namely open carry. Most states have implemented some form of open carry law; however, not all states have applied the same kind of laws. Some states have enacted laws with restrictions regarding the type of firearm that can be visibly carried and whether the gun can be loaded or not. Therefore, the open carry law should be examined from various aspects.

Wallace (2017) examined concealed carry with a survey of gun owners and nongun owners, inquiring about their feelings regarding guns and gun control policies. The comfortability of being open about gun ownership status was also important. Wallace found a stigma surrounding gun ownership, which "refers to negative societal

perceptions of an individual or class of individuals based on some personal attribute or behavior" (p. 269). The accuracy of these observations was open to individual interpretation. In some areas of society, gun ownership may be frowned upon but celebrated in others. The strengths and weaknesses of this research are the same as in the previously mentioned study (see Wallace, 2019). Wallace identified a primary study weakness as the accuracy and truthfulness of participant responses. The strengths were that it also contributed to the academic literature on the gun control debate as well as providing a view of how some Americans feel about gun ownership.

As mass shootings and other incidences of gun violence increase in the United States, public concern over gun control and ownership has intensified. Anestis et al. (2017) examined gun laws and their possible association with suicide rates. They noted that firearm literature has already shown a strong connection between gun ownership and suicide rates. However, this study was designed to examine suicide rates and gun legislation. One of the weaknesses of the study was the limited timeframe in which the suicides occurred (2013–2014). It is possible that if the number of study years were to be increased, the researchers could have been able to access a larger population, thereby creating a more robust analysis result (Anestis et al., 2017). A strength of this approach was that it included an extensive range of covariates. This broader range allowed Anestis et al. to better pinpoint variables that are more typical of suicide, and therefore preventative measures could be created.

Death by gun violence has steadily increased throughout the years in the United States. Organizations such as the American Medical Association (2022) have advocated

that gun violence should be considered a public health issue. People die daily from gun violence, and there has been little to no publicly funded research on this due to government restrictions. For this reason, more research should be conducted on gun violence (American Medical Association, 2022).

Studies involving gun control and gun laws are often qualitative. Empirical studies related to gun laws or gun violence work to inform individuals of both public laws and safety (Clark, 2017). There have been several studies on gun violence; however, they tend to be focused on their communal effects (Bailey, 2011; Chandler, 2018; Clark, 2017; Cox, 2016; Hodges, 2017; Ndikum, 2018; Tuason & Güss, 2020). Communal effects of gun violence include the demographic most affected, how gun violence affects certain groups of people, and mental illness. Each of these gun violence incidents has further galvanized public fear and outrage, further prompting the need for gun reform.

Legislative policymakers have debated gun control for many years. The country's first significant gun control law was the National Firearms Act (1934), initially created to combat gang violence. A tax was placed on creating and selling certain weapons and firearms most often used by gangs. The firearms and weapons included in the act were silencers, sawed-off shotguns, rifles, and machine guns (National Firearms Act, 1934). A noteworthy case involving the Act was the *United States v. Miller* (1939). In this case, Jack Miller and Frank Layton were charged with breaching the Act by transporting a 12-gauge sawed-off double-barrel shotgun across state lines. Initially, the defendants argued that the Act violated their Second Amendment right to bear arms. The federal district court agreed, and the case was dismissed. However, it was brought before the US

Supreme Court and reversed. The Supreme Court held that the Second Amendment did not grant individuals the legal right to bear certain types of guns, such as a 12-gauge sawed-off shotgun (*United States v. Miller*, 1939). Other gun laws, such as the Gun Control Act (1968), were signed into law by President Lyndon B. Johnson and provided more stringent restrictions on firearms, such as prohibiting drug users, mentally ill individuals, and felons from being able to purchase guns (Possession of Firearms and Dangerous Weapons in Federal Facilities, 2006).

As gun laws have evolved, so has the interpretation of the Second Amendment regarding the right to keep and bear firearms. Although the Supreme Court previously ruled that certain types of firearms are illegal to possess, that ruling was overturned in *District of Columbia v. Heller* (2008). In this case, the Supreme Court ruled that the Second Amendment did protect nonmilitary individuals' rights to possess a firearm and use it for traditionally lawful purposes, such as home self-defense. This ruling was significant because it demonstrated that legislators and the Supreme Court have no all-encompassing or definitive verdicts in cases involving the Second Amendment due to its ambiguous language.

Federal firearm statutes tend to provide more broad interpretations of gun restrictions, whereas, at the state level, more specific language is provided. The *Possession of Firearms and Dangerous Weapons in Federal Facilities* (2006), a United States Code, should be more specific to include guns or firearms instead of weapons. Gun laws at the state level tend to have more precise language to lessen the need for broader interpretations. According to Hodges (2017), "Firearm bans have been implemented at

the state level since the 1830's" (p. 10). Alabama is an open carry state that only requires a permit for concealed weapons (Carrying Concealed Weapons, 1975/2022). In Alabama, most individuals over 18 years old can openly carry firearms in public without a permit (Disorderly Conduct, 1975/2013). Although there is federal gun legislation, gun policy studies must be conducted that review gun law at the state level. State level gun legislation affects individuals more closely than at the federal level. Several studies have concluded that strong state gun policies are associated with lower firearm mortality rates (Liu et al., 2020; Siegel et al., 2019). Closely examining firearm policies at this level of government can show policymakers how individuals are affected by guns depending on the specified variables of study (e.g., age, race, demographic area, education level, etc.).

Semenza et al. (2020) examined the connection between race, firearm homicide, and gun dealers in relation to the legal possession of firearms and its influence on firearm violence in different demographic areas along with possible violent situations. Semenza et al. (2020) hypothesized that the presence of gun shops in certain areas degraded the neighborhoods and emboldened criminal acts. Areas with gun stores typically have higher gun violence levels, further signaling a greater sense of social disorganization (Semenza et al., 2020, 2022; Stansfield & Semenza, 2019). Regions with incidences of elevated firearm violence will generally have more access to weapons, whether they are obtained legally or illegally (Hill et al., 2022; Keil et al., 2020; Vaughn et al., 2022; Zeoli et al., 2020).

Communities of color are disproportionately affected by gun violence. The leading cause of morbidity for young Black males is firearm homicide (Semenza et al.,

2020; Sokol et al., 2022; Vaughn et al., 2022). The hardship of gun violence unfairly affects Black communities, with previous firearm studies demonstrating a steady pattern of Black men being killed by guns more than any other race. According to Semenza et al. (2020), "Although Black men make up only 6% of the population of the US, they account for 51% of all [firearm] homicide victims in the country" (p. 5). For this reason, the racial dynamics of firearm violence should be examined more closely.

Because communities of color are affected more often by gun violence, there is an increased likelihood that residents will own and possess firearms. Community violence is a significant reason many youths carry firearms (Sokol et al., 2022). Various firearm behaviors were examined in a survey involving individuals aged 16-29. In their research, Sokol et al. (2022) concluded that a positive relationship existed between community violence and firearm use. In a study by Semenza et al. (2020), firearm homicide data were collected from the National Violent Death Reporting System and the Bureau of Alcohol, Tobacco, Firearms, and Explosives. The data were separated and analyzed for White and Black homicide victims. Data from 27 states were examined, with a total of 10,616 firearms deaths recorded between the years 2015 and 2017. For analysis, deaths were reviewed at the county level, with the DV being the gun homicide victim count. White gun homicides and Black gun homicides were further grouped into the event specific categories of gangs, drugs, and intimate partner violence. Results showed that gun homicide affected Black victims associated with gangs or drugs more than their White counterparts. Semenza et al. addressed how firearms legally purchased through federally licensed firearm dealers contributed to the broader societal problem of firearm

violence in the United States, with emphasis on race and circumstances surrounding gun deaths.

Mass casualty events have increased the need for attention on public policy relating to gun laws. According to Hellenbach et al. (2018), “Guns have always had a legal place in society” (p. 173) and are easily accessible to various individuals. The government has tried to enact several regulations and restrictions to help decrease the number of available guns. Although many research studies have been conducted concerning gun violence, few have examined this in correlation with contributing gun laws, such as open carry versus concealed carry and gun ownership and carry permit requirements (H. E. Jones & Horan, 2019; Wallace, 2017, 2019). Levels of firearm violence have increased the need to further explore different areas of this problem (Jang, 2019; Ndikum, 2018).

According to Wallace (2019), “Empirical studies of open carry perceptions are largely absent from the literature” (p. 818). Studies involving open carry remain very limited. In the literature search, I could not locate any studies that took a quantitative approach to examining open carry. Studies regarding open carry tended to focus on perceptions and feelings regarding the open carry law.

Previous quantitative firearm studies have examined gun policies at the state level; however, these studies reviewed the policies of multiple states (Fleegler et al., 2013; Kaufman et al., 2018; Liu et al., 2020; Siegel et al., 2019). The quantitative nature of these studies is important because they provide a clear, realistic view of the results of firearm legislation. This helps further emphasize the need for individual state level

studies. Examining individual state laws is necessary because it can help states determine how specific gun laws affect residents. Investigating variables such as age, race, sex, various types of firearm violence or death, mental health, and gun ownership could help determine whether cause and effect relationships exist and if these relationships are statistically significant.

Summary and Conclusions

A central theme in the literature regarding firearm violence is that it is a public health issue that requires nationwide attention. Various aspects of gun violence have been studied as it affects society daily. This multifaceted issue requires policymakers to think strategically on a large-scale basis. Numerous gun control laws have been implemented; however, until those laws are enforced equally among all citizens, gun violence rates may not decrease. Firearm violence is well studied; however, despite an increase in severity, little is known about how to best decrease firearm death rates. The U.S. government has continued its efforts to help combat the gun violence epidemic (American Medical Association, 2022; Ndikum, 2018).

My study helped to further close the information gap related to open carry firearm legislation in Alabama's open carry era. Studying the open carry law as it relates to gun-related death rates provided additional information about how it has affected gun violence incidences specific to death-related classifications in the pre and post open carry eras. In Chapter 3, I discuss the study's research design and rationale, methodology, data analysis plan, and probable threats to validity.

Chapter 3: Research Method

The purpose of this quantitative study was to provide an enhancement to the existing body of information related to firearm deaths by providing a statistically-based perspective of the open carry statute in the five most populated Alabama counties of Jefferson, Madison, Mobile, Montgomery, and Shelby. In this chapter, I present the study's research design and rationale. I also discuss the methodology and threats to validity.

Research Design and Rationale

This study was designed to assess whether a statistically significant relationship existed between gun death rates and implementation of Alabama's personal firearm open carry law. Three RQs were addressed in this study. Stratified data of firearm-related deaths included accidental, suicide, homicide, and legal intervention. Race, gender, and age were also included as predictive variables for statistical analyses in RQ2 and RQ3. This provided information regarding whether enactment of the open carry law had a statistically predictive effect on firearm mortality rates and categorization.

A nonexperimental inferential quantitative research design was selected to analyze these variables. Demographic data regarding race, age, and gender which served as controls were investigated along with firearm-related death statistics to determine whether significant relationships existed for each RQ (see Table 1).

Table 1

Research Variables

RQ	IV	DV	Test statistic	Covariates
RQ1	Number of gun-related deaths pre-2013 open gun carry legislation	Number of gun-related deaths post-2013 open gun carry legislation	Independent samples *t* test	
RQ2	Gun-related death classifications (homicide, suicide, accidental, legal intervention)	Gun-related death rates pre-2013 open gun carry legislation change	Linear regression	Age Gender Race
RQ3	Gun-related death classifications (homicide, suicide, accidental, legal intervention)	Gun-related death rates post-2013 open gun carry legislation change	Linear regression	Age Gender Race

The two time periods 2007–2012 and 2014–2019 were used for analyses. Designs using alternative or sequential time periods are often favored among criminal justice researchers when examining policy interventions because it provides the ability to focus on a specified policy during a specified time (Berk, 2022; Boehme, Kaminski, & Leasure., 2022; Boehme, Kaminski, & Nolan., 2022; Collings et al., 2022; Corburn et al., 2022; Degli Esposti et al., 2022; Koppel et al., 2022; Sun et al., 2022).

For my study, I used publicly available secondary data for analyses of firearm deaths during Alabama's pre and post open carry eras with specific analyses of Jefferson, Madison, Mobile, Montgomery, and Shelby counties. This secondary data contained information that was accessible to the public regardless of an individual's profession, purpose, or other association. Using this readily available database saved time and effort

and facilitated timely data analyses once I received Walden University's Institutional Review Board (IRB) approval to conduct research (Approval No. 12-13-22-0340049).

A quantitative design was appropriate for collection of information and assigning mathematical values to selected variables. Additionally, use of the database permitted data examination in natural, clean, and unmanipulated states. Martin et al. (2019) noted that using large-scale databases allows for a greater sense of academic growth through larger sample sizes.

Boehme, Kaminski, and Leasure (2022) and Sun et al. (2022) described time series analysis as an appropriate design choice for policy study as it involves the examination of a law or an event over a specific period. Because I sought to determine an a posteriori foundation between the pre and post time periods, a full-scale time-series analysis will be reserved for future research.

Methodology

Population

The study population was individuals living in the five most populated counties in Alabama. The selected population was delimited to only include individuals who resided and died in Alabama during the designated timeframes in Jefferson, Madison, Mobile, Montgomery, and Shelby counties. Data from counties with populations less than 200,000 were not used. The sample timeframe was any firearm-related death entry listed in the state of Alabama's public health database from 2007 to 2019. Death entry categories included accidental, suicide, homicide, and legal intervention deaths involving

firearms. I cover equal periods before and after the open carry law was implemented to determine whether a statistically significant relationship existed.

Sampling and Sampling Procedures

The sampling method for this study was criterion. The study sample was selected from the raw data provided by the ADPHCHS from 2007 to 2019. No additional procedures or steps were required to collect the study sample as the needed numerical data were already generated in this publicly accessible dataset. Criterion sampling is time efficient and useful when researchers seek to obtain more in-depth comprehensive knowledge about a particular phenomenon (Glen, 2022). Warner (2013) stated that criterion sampling requires researchers to select study participants; by using this data selection method, the study's effectiveness was strengthened as the researcher had clear criteria for study inclusion. The larger the sample size, the greater the probability of a more accurate study sample (Hepburn et al., 2022).

Alabama's open carry law affects all citizens within the state. This study was designed to examine firearm-related mortality rates in the five most populated counties in Alabama, which had the higher levels of gun-related deaths. Therefore, only gun-related death rates (suicide, accidental, homicide, undetermined intent) recorded by the state of Alabama in these five counties were examined for statistical significance. Per the ADPHCHS database, a rate is the number of items having a particular characteristic divided by the total number of items. Rates are commonly expressed to a standard base of 100, 1,000 or 100,000. For this reason, counties with a population of over 200,000 residents were ideal for study inclusion based on population size (ADPHCHS, n.d.-a,

n.d.-b, n.d.-c, n.d.-d, n.d.-e, n.d.-f, n.d.-g, n.d.-h, n.d.-i, n.d.-j, 2010, 2013, 2015, 2021). For RQ1, G*Power 3.1 was used to determine the minimum sample size (two-tailed, alpha = 0.5, power = .80, effect size = 0.5) for the independent samples *t* test of independent means, with a resulting *n* = 254 matched cases with at least *n* = 127 in each case. For RQ2 and RQ3, G*Power 3.1 was used to determine the minimum sample size (alpha = 0.5, power = .80, effect size = 0.5, predictor variables = 7) for multiple regression analyses with R^2 deviation from zero, with a resulting *n* = 178 complete cases. For my statistical analyses, the larger sample size served as the target threshold for all analyses.

Procedures for Recruitment, Participation, and Data Collection

Secondary data were obtained from the publicly available datasets provided by the ADPHCHS. Online access to the ADPHCHS's website allowed the download of the appropriate datasets containing the required population and gun death information for 2007–2019. Dataset information was obtained from firearm-related death certificates and reports filed with the Center for Health Statistics within the Alabama Department of Public Health. In Alabama, it is the funeral director's responsibility to obtain demographic information from the next of kin to complete the death certificate. When an Alabama resident dies in another state, the state receives a notification report from that state, and the out-of-state death is recorded and included in the published dataset. Under Alabama law, the doctor in charge of the patient's care when the death occurs is responsible for correctly determining the cause of death when completing the medical certification portion of the death certificate. In instances where death occurs without the

individual being under a doctor's care, the county coroner or medical examiner bears the responsibility of determining the cause of death (ADPHCHS, n.d.-a, n.d.-b, n.d.-c, n.d.-d, n.d.-e, n.d.-f, n.d.-g, n.d.-h, n.d.-i, n.d.-j, 2010, 2013, 2015, 2021).

Information included in the ADPHCHS datasets was introduced as rates, ratios, frequencies, and percentages. For comparison purposes, rates, ratios, and percentages were provided to homogenize the figures. A rate is the number of items having a particular characteristic divided by the total number of items. Rates are commonly expressed to a standard base of 100, 1,000 or 100,000. A ratio is a comparison of two quantities and is commonly notated as a fraction. The frequency units indicated the number of times an event occurred for a specific population (ADPHCHS, n.d.-a, n.d.-b, n.d.-c, n.d.-d, n.d.-e, n.d.-f, n.d.-g, n.d.-h, n.d.-i, n.d.-j, 2010, 2013, 2015, 2021). The dataset used for analyses was assumed to reflect true and accurate reporting of gun-related deaths.

Operationalization of Constructs

The variables examined involved firearm-related deaths before and after the 2013 implementation of the open carry gun legislation in Alabama. The specific deaths reviewed were suicide by discharge of a firearm, homicide by discharge of a firearm, accidental discharge of a firearm, and legal intervention deaths involving the discharge of a firearm. The secondary data were obtained from the publicly available datasets provided by the ADPHCHS.

Quantitative studies involve values that may be constant or display variation. The study years of 2007–2019 was the time span variable to be changed for analyses. The

years of study were separated into two groups: before open carry (2007–2012) and after open carry (2014–2019). The variables measured were firearm mortality rates and the previously specified gun death classifications, which were examined for statistical significance.

Data Analysis Plan

SPSS Version 28 was used for data analysis to perform the independent samples *t* test and multiple linear regression analyses. To be included in ADPHCHS publications, all reports and certificates are reviewed and verified by Center for Health Statistics staff to ensure that reports are complete and authenticated by signature. Death data are manually keyed and coded into the database by Center for Health Statistics personnel. Incomplete reports are returned to the provider for correction. To better address data cleanliness, several accuracy checks are conducted before data are allowed to be included in ADPHCHS publications. Once ADPHCHS receives certificates and reports, the details are evaluated for all required data and signatory information. Also, for items with a missing value for calculation of rates and ratios, these unknown values are subtracted from the denominators before the calculations are made (see ADPHCHS, n.d.-a, n.d.-b, n.d.-c, n.d.-d, n.d.-e, n.d.-f, n.d.-g, n.d.-h, n.d.-i, n.d.-j, 2010, 2013, 2015, 2021). In accordance with Alabama's vital statistics laws, publication data is obtained from the reports filed with the Center for Health Statistics in the Alabama Department of Public Health. The state registrar of vital records enforces the state's statistics laws. Only accurate and consistent data are included in the publication of the vital records. Therefore, I assumed that the information in the database was accurate.

Research Questions and Hypotheses

The following RQs and hypotheses guided this study:

RQ1: Based on reported gun-related death rates prior to Alabama's open carry law of August 1, 2013, is there a statistically significant difference in the overall number of gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby after Alabama's open carry law implementation?

$H_0$1: The number of gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby are not significantly different between 2007 precarry status and post-2013 open carry law implementation.

H_a1: The number of gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby are significantly different between the 2007 precarry status post-2013 open carry law implementation.

RQ2: Using the ADPHCHS database for 2007–2019, which pre-2013 gender and race, age distribution, and gun-related death classifications (homicide, suicide, accidental, and legal intervention) predictor illustrated significant R^2 variance in gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby?

$H_0$2: There are no gender and race, age distribution, and gun-related death classifications (homicide, suicide, accidental, and legal intervention) in the pre-2013 timeframe that illustrated significant R^2 variance in gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby.

H_a2: There are gender and race, age distribution, and gun-related death classifications (homicide, suicide, accidental, and legal intervention) in the pre-2013

timeframe that illustrated significant R^2 variance in gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby.

RQ3: Using the ADPHCHS database for 2007–2019, which post-2013 gender and race, age distribution, and gun-related death classifications (homicide, suicide, accidental, and legal intervention) illustrated significant R^2 variance in gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby?

$H_0$3: There are no gender and race, age distribution, and gun-related death classifications (homicide, suicide, accidental, and legal intervention) in the post-2013 timeframe that illustrated significant R^2 variance in gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby.

H_a3: There are gender and race, age distribution, and gun-related death classifications (homicide, suicide, accidental, and legal intervention) in the post-2013 timeframe that illustrated significant R^2 variance in gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby.

This inferential quantitative study involved an independent samples *t* test, chi-square, Pearson correlation test, analysis of variance (ANOVA), and linear regression analyses. The independent samples *t* test and chi-square analysis were used to test the hypothesis for RQ1, and Pearson correlation test, ANOVA, and linear regression analyses were used to test the hypotheses of RQ2 and RQ3. The independent samples *t*-test is designed to test sample hypotheses when the standard deviation is not known to the researcher (Warner, 2013). This test is used when comparing the means of different groups that share the same DV. Independent samples *t* tests are often used by researchers

in the study of firearms to identify differences among variables (Barao et al., 2021; Murhega et al., 2022; Orr et al., 2021; Wu, 2022). For RQ2 and RQ3, a regression design was chosen because this method is designed to measure whether there is a predictive relationship between two or more variables (Barao et al., 2021; Ranganathan et al., 2017). The estimative nature of regression analyses made it more appropriate for this firearm study, as it gives researchers additional possibilities to evaluate study outcomes of a predictive nature.

Assumption Testing

The basic assumptions associated with the independent samples *t* test and linear regression analyses involve sample independence and normal distribution. Further, linear regression requires addition assumption testing to evaluate multicollinearity, homoscedasticity, and the normal distribution of the regression model residuals. It is assumed that every sample used for analysis is taken from a generally distributed population sample. Sample independence refers to the assumption that data samples are selected autonomously from one another. The assumption regarding variance equality refers to the ability to verify or reject the null hypothesis (Warner, 2013).

Originally, if study assumptions were violated, I would have performed various data transformations to reduce or eliminate these violations. These methods are varied and can include performing a Welch test, Yuen-Welch test (Warner, 2013), or Bonferroni correction (Vickerstaff et al., 2019) among other data transformation tools. A Pearson's correlation test was performed because outlier data that may have altered the normal curve distribution was discovered.

Threats to Validity

In research studies, there are several threats to validity that can affect interpretive outcomes. The more researchers can identify potential validity threats, the less likely these threats will manifest. Research studies can have both internal and external validity threats. Sampling bias and random sampling errors are the external validity threats that could have affected this study. Sampling errors occur when the participants in a study differ significantly from the actual population in which the sample was taken. The use of secondary data can exacerbate these external validity threats. In using secondary data, I assumed the population recorded was a correct and reliable representation of the population. These sampling threats were addressed by providing thorough descriptions of the population and how the study sample was selected (see Bottcher et al., 2022; P. M. Carter et al., 2022; Flippin et al., 2022; Warner, 2013). An internal validity threat involved the default racial categorization utilized in the ADPHCHS database. For this secondary data, when the race of an individual resident is unknown, that particular mortality count is then placed in the category of Black. Default category placement practices such as this give the appearance that racial data will be biased (ADPHCHS, n.d.-a, n.d.-b, n.d.-c, n.d.-d, n.d.-e, n.d.-f, n.d.-g, n.d.-h, n.d.-i, n.d.-j, 2010, 2013, 2015, 2021).

Ethical Procedures

This study utilized secondary data obtained from the ADPHCHS database. This research study was reviewed using Walden University's IRB guidelines. No agreements or permissions were required to access the publicly available information. Available

database information was deidentified and contained no other identifying information. Therefore, anonymity and confidentiality for all firearm-related deaths were guaranteed. Accordingly, no threat of violating participants' rights was identified.

The goal of this study was to provide legislative policymakers with a quantitative analysis depicting the statistical relationship between current gun laws and firearm mortality rates in Alabama. The projected audience for this study included policymakers and other researchers. It would be beneficial to share the study's findings in online discussions, conference presentations for gun control advocacy groups, newsletters and journals, such as *SAGE Public Policy & Administration*, to have an influential effect on policymakers. I have completed the Collaborative Institutional Training Initiative course materials (See Appendix A) to ensure an adequate understanding of the proper use of data and reporting. Study data will be retained for 5 years in a password-protected file, and electronic files will be encrypted and deleted at the conclusion of the retention period.

Summary

This quantitative study involved an independent samples *t* test, chi-square analysis, Pearson correlation testing, ANOVA, and linear regression analyses to explore whether a statistically significant relationship existed between implementation of the open carry gun statute and firearm-related deaths in Alabama. Archived secondary data were collected from the ADPHCHS. This study involved addressing three RQs. Firearm-related deaths included accidental, suicide, homicide, and legal intervention. Covariates of race, gender, and age were included for statistical analyses of RQ2 and RQ3. Chapter 4 includes information about the data collection process and results of the completed study.

Chapter 4: Results

The purpose of this quantitative study was to provide an enhancement to the existing body of information related to firearm deaths by providing a statistically-based perspective of the open carry statute in the five most populated Alabama counties of Jefferson, Madison, Mobile, Montgomery, and Shelby. I analyzed gun-related death rates and death classifications in two time periods, pre and post open carry open carry statute changes in Alabama. I examined gun-related death classifications of homicide, suicide, accidental, and legal intervention involving firearms. This chapter includes the methodological changes, RQs and hypotheses, data collection, statistical testing, and output reporting.

Methodological Changes

Modifications to the methodology originally described in Chapter 3 were made. The initial methodology included an independent samples *t* test and linear regression using a completed per case ADPHCHS data set. Secondary firearm mortality data sets were provided by the ADPHCHS, but all data were received as frequencies rather than per case entries, percentages, or rates. Data sets were loaded into SPSS in to convert data to use weighted cases rather than aggregate for all statistical analyses. The acquired frequency data was received as summarized data. As such, these aggregated cases would not be accurately processed during statistical computations without using a case weighting feature. Using weighted data, each of the two time periods were independently evaluated using frequency distributions to examine for case outliers, erroneous data entries, and to assess the underlying assumptions for statistical processing.

For RQ1, the data was on the boarder of violating the assumptions for the independent samples *t* test. A significant difference was found between the firearm mortality rates recorded for the two time periods of 2007–2012 and 2014–2019. Due to this close approximation to the assumption violation, the significant finding needed to be confirmed using a nonparametric test. A chi-square goodness of fit test was chosen for a post hoc analysis. For RQ2 and RQ3, it was determined that there were significant outliers that may impact regression modeling. Therefore, the PreGun and PostGun data were log-transformed to reduce the influence of these variables.

The final methodological change was in the construction of the RQ2 and RQ3. As initially proposed, gender, race, and age were considered control variables and would be entered together in Model 1 of the regression/ANOVA tables to examine the influence of death classification as the primary predictor. Due to complexities of the data involving summed frequencies, case weighting of these predictors was necessary. To assist with regression model interpretation, I opted to enter the IVs in sequence starting with gender and race, followed by age distribution, and finally death classification categories. For the reason, RQ2 and RQ3 have been updated throughout the entire study.

Demographics

The sample population consisted of individuals who died in the five selected counties in Alabama due to a firearm-related incident. Firearm-related deaths are categorized in the ADPHCHS set as homicide, suicide, accidental, and legal intervention. I used ordinal data labeling for victim ages, and those were further collapsed to aid in statistical interpretation. The overall age span was listed as under 1 to 9 years through 80

years and greater. Gender was categorized as male or female and race was categorized as Black, White, or Other. The race listed as Other was included in the category of Black. Gender and race were combined in the frequency data, adding to the complexity of data analyses. Table 2 illustrates demographic variable information for both time periods along with the measures of central tendency. Central tendency is a measurement used to identify the central location of statistical distribution within a data set. Valid measures include mean (*M*), median, and mode, with *M* being the most used measurement because it is the only one that includes every data set value for calculation (Laerd Statistics, n.d.-a). For the two time periods, PreGun legislation had *M* = 20.59 and PostGun legislation had *M* = 28.71. Both time periods had the same mode values for county of death (1), age distribution (3), death classification (3), and gender and race classification (3).

Table 2

Demographic Variables

	County of gun death	Age distribution	Death classification	Gender and race classification	PreGun legislation	PostGun legislation
Valid	2291	2291	2291	2291	2291	
Missing	0	0	0	0	0	
M					20.59	
Median		4.00			11.00	
Mode	1.00	3.00	3.00	3.00		
SD					24.49	
Skewness					1.99	
Kurtosis					3.58	
Valid	2872	2872	2872	2872		2872
Missing	0	0	0	0		0
M						28.71
Median		4.00				15.00
Mode	1.00	3.00	3.00	3.00		
SD						34.38
Skewness						1.65
Kurtosis						1.63

Data Assumptions

To assess the assumption of normality, skewness and kurtosis of both time periods were examined. A kurtosis value of no greater than +/-3 is a goal to assume normal distribution of data (Warner, 2013). As illustrated in Table 2, the kurtosis normality assumption for the PreGun time period was violated, with a kurtosis value of 3.58. Scale level data for both time periods were Log 10 transformed and skew and kurtosis values were again assessed. The PreGun skew (.490 [SE .176]) and kurtosis (-.202 [SE.349]) and PostGun skew (.484 [SE .164]) and kurtosis (-.175 [SE .327]) illustrated more normally approximated data sets that meet statistical testing assumptions. Therefore, log transformed scale data were used for regression testing.

Descriptive Statistics

Tables 3–6 and Figures 1–6 display descriptive statistics by testing time frames separated by age, death classifications, gender, and race. Descriptive statistics are important to review as they provide clear comparative illustrations of the data set demographic distributions. Tables 3–6 indicate, in most comparative categories, an increase in gun related deaths in the PostGun legislation time period.

Table 3

Descriptive Frequencies and Percentages for Counties in PreGun and PostGun Legislations

County	PreGun legislation		PostGun legislation	
	Frequency	%	Frequency	%
Jefferson	977	42.6	1241	43.2
Madison	332	14.5	430	15.0
Mobile	563	24.6	625	21.8
Montgomery	305	13.3	431	15.0
Shelby	114	5.0	145	5.0
Total	2291	100	2872	100

Table 4

Descriptive Statistics for Age Distribution in PreGun and PostGun Legislations

Age of distribution	PreGun legislation	PostGun legislation
Under 1 to 9 years	13	25
10 to 19 years	207	254
20 to 29 years	652	791
30 to 39 years	429	604
40 to 49 years	354	406
50 to 59 years	295	323
60 to 69 years	185	233
70 to 79 years	85	153
80 years and greater	71	83

Figure 1

Descriptive Statistics for Age Distribution Cases Weighted by PreGun Legislation

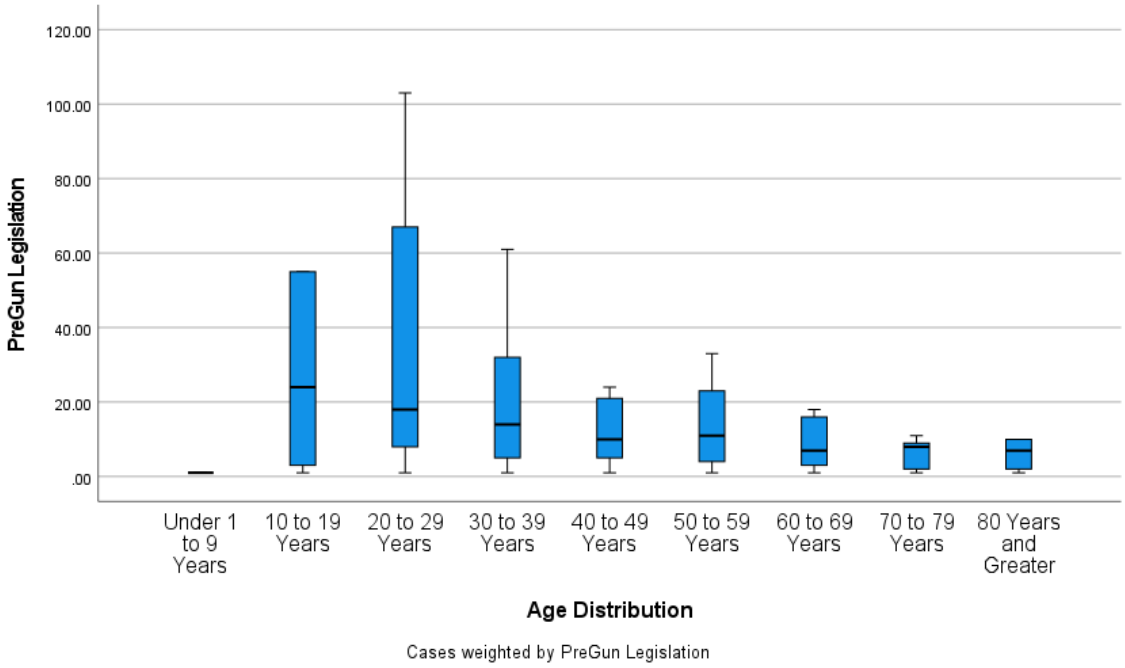


Figure 2

Descriptive Statistics for Age Distribution Cases Weighted by PostGun Legislation

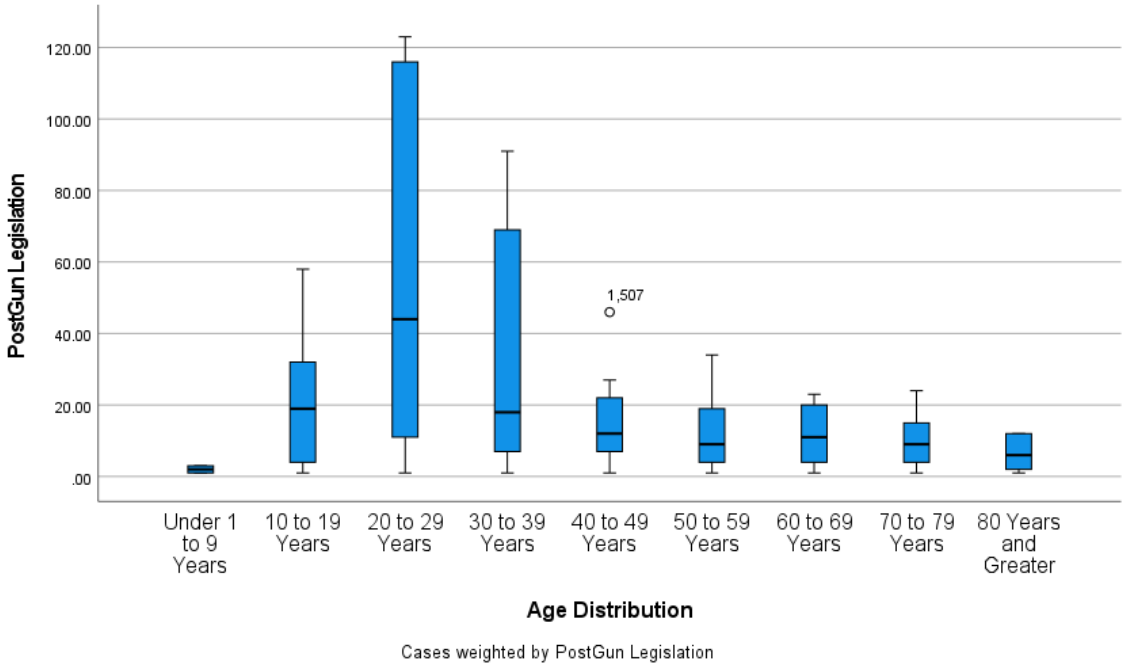


Table 5

Descriptive Statistics for Death Classifications in PreGun and PostGun Legislations

Death classification	PreGun legislation	PostGun Legislation
Accidental	80	57
Suicide	1016	1189
Homicide	1172	1601
Legal intervention	23	25

Figure 3

Descriptive Statistics for Death Classification Cases Weighted by PreGun Legislation

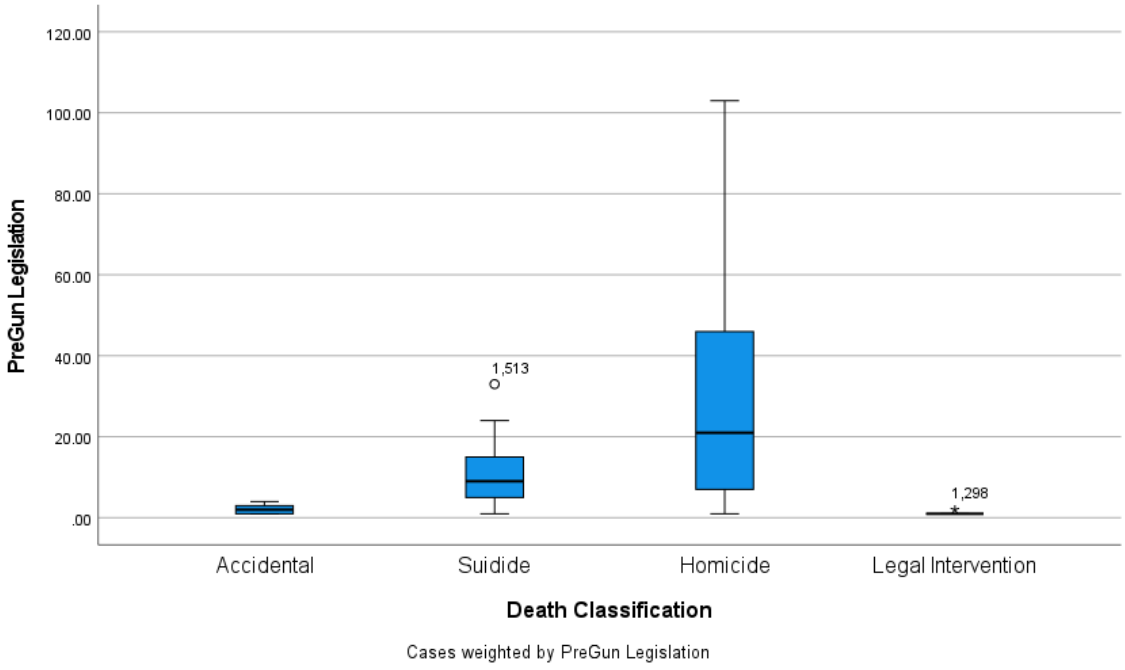


Figure 4

Descriptive Statistics for Death Classification Cases Weighted by PostGun Legislation

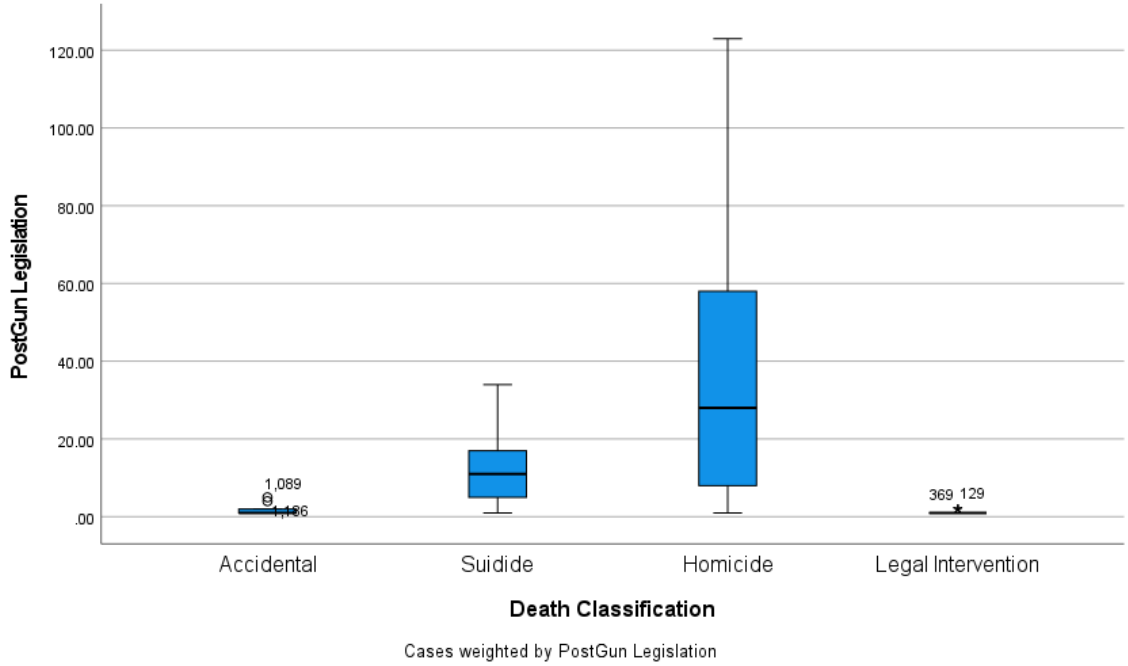


Table 6

Descriptive Statistics for Gender and Race Classification in PreGun and PostGun Legislations

Gender and race classification	PreGun legislation	PostGun legislation
White male	919	1064
White female	238	275
Black and Other male	1001	1343
Black and Other female	133	190

Figure 5

Descriptive Statistics for Gender and Race Classification Cases Weighted by PreGun Legislation

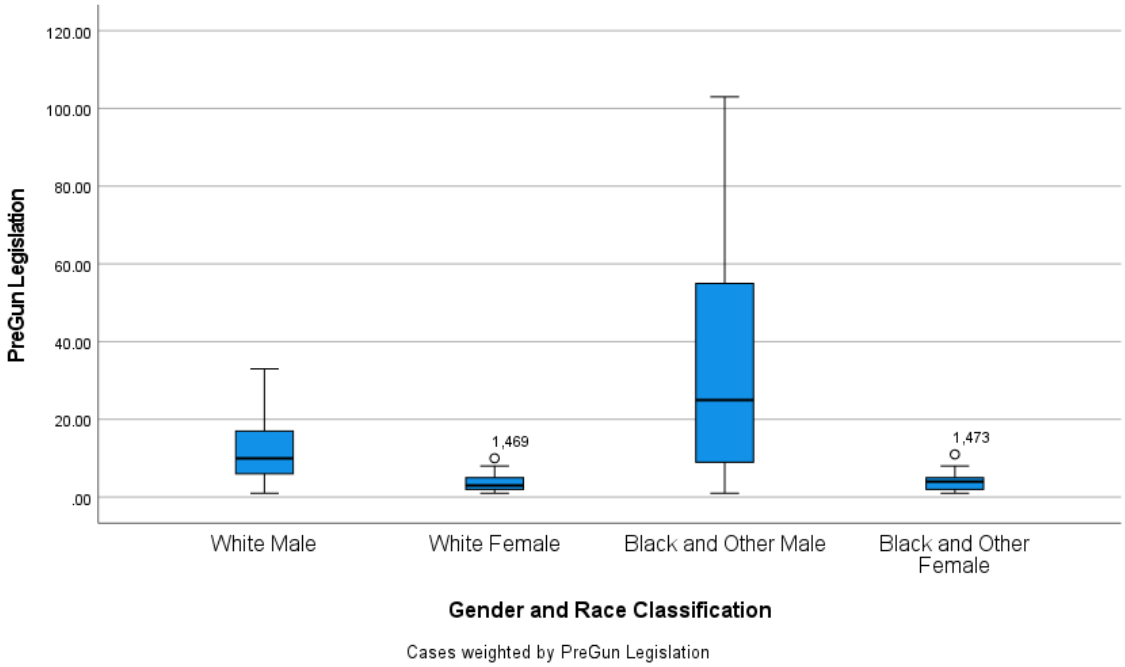
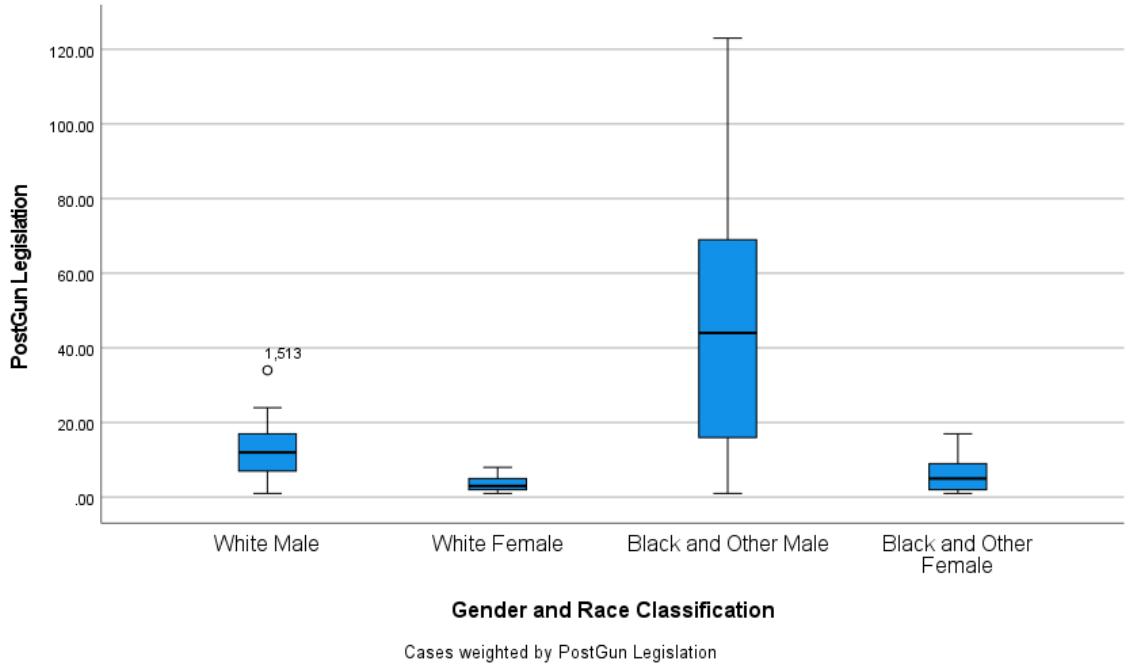


Figure 6

Descriptive Statistics for Gender and Race Classification Cases Weighted by PostGun Legislation



Data Collection

Firearm mortality data were collected for the years 2007 to 2019 by the ADPHCHS; I requested these data files, which were provided by the agency. Once the data sets were received, they were migrated into SPSS v. 28 and data transformed into the time periods of interest: (a) PreGun consisting of data from years 2007 to 2012 reflective of pre-carry legislative practices, and (b) PostGun consisting of data from years 2014 to 2014 reflective of post-carry legislative practices. Data from 2013 were omitted from analyses as this was the transition year from permit carry to open carry legislation. Upon

data examination, there were no data collection discrepancies and all received data conformed to the Chapter 3 data analysis plan with the exception of frequency reporting.

A criterion sampling method was used from the supplied data set. The ADPHCHS data set included individuals who resided and died in Alabama during the requested timeframes. Furthermore, the data were truncated by the agency to the requested delimitations of Jefferson, Madison, Mobile, Montgomery, and Shelby counties, as these have populations of 200,000 or more and an assumed higher likelihood of gun-related violence than less populated and rural classified Alabama counties.

Results

To address RQ1, analytical models of an independent samples *t* test and chi-square tests were performed for hypothesis testing. Analytical models of Pearson correlation, descriptive statistics, linear regression, and ANOVA tests were executed in the hypotheses testing of RQ2 and RQ3. These analytical tests were the most appropriate to address the research problems of this quantitative study utilizing the data obtained from the ADPHCS.

Research Question 1 and Hypotheses

RQ1: Based on reported gun-related death rates prior to Alabama's open carry law of August 1, 2013, is there a statistically significant difference in the overall number of gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby after Alabama's open carry law implementation?

$H_0$1: The number of gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby are not significantly different between 2007 precarry status and post-2013 open carry law implementation.

*Ha*1: The number of gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby are significantly different between the 2007 precarry status post-2013 open carry law implementation.

To test the hypotheses of RQ1, an independent sample *t* test was used to examine the time periods of interest. In conducting the independent *t* test, the Hartley test for equal variance was included. This test was done to ensure that the data of the different testing groups shared a similar level of variance (see Kim, 2022). Data must pass this homogeneity of variance test to correctly interpret the statistical outputs. Table 7 illustrates the sample time period means and standard deviations and Table 8 illustrates the independent *t*-test outputs. The Hartley test for equal variance was significant. This significant finding illustrates that the two data sets did not display homogeneity of variances; therefore, the equal variances not assumed output was used for interpretation.

Table 7

Summary Independent Samples t-Test Data

	N	*M*	*SD*	*SEM*
Time Period 1	2291.000	2291.000	20.591	.512
Time Period 2	2872.000	2872.000	34.381	.642

Note: *N* = Number of firearm deaths.

Table 8

Independent Samples Test

	M difference	*SE* difference	*T*	*Df*	Sig. (2-tailed)
Equal variances assumed	-8.120	.851	-9.538	5161.000	.000
Equal variances not assumed	-8.120	.821	-9.895	5098.849	.000

Note. Hartley test for equal variance: F = 1.970, Sig. = 0.0000. The *M* difference is significant if $p < .05$ (Sig.).

Using the equal variances not assumed outputs, the results of the *t* test illustrated a significant difference in overall gun violence reported deaths between the two legislative time periods. Therefore, I rejected the null hypothesis in favor of the alternative hypothesis. The PostGun time period had more deaths in the five counties of interest than these same counties in the PreGun time period. This outcome illustrates that there was a significant impact on firearm mortality rates in the PostGun legislation era and the implementation of Alabama's new open carry gun law is likely a contributing factor. Crifasi et al. (2021) noted that open carry gun legislation has a direct effect on gun violence overall and my study findings support this position.

Post Hoc Confirmatory Testing Research Question 1

Chi-Square Test

Given the significant Hartley test for equal variance in the *t* test, a confirmatory statistical process using nonparametric statistical processes was needed for confirmatory analysis for significant differences in gun related deaths between the two legislative time periods. Chi-square is a nonparametric test used to evaluate differences in proportions

where normally distributed data are not assumed. Using the initial data set, without log transformation, the chi-square output between the two legislative time periods illustrated a significant difference in proportion as shown in Tables 9-10.

Table 9

Post Hoc Analysis: Chi-Square Descriptive Statistics

	N	*M*	*SD*	Minimum	Maximum	25th	50th median	75th
PreGun legislation	440	5.21	8.96	1.00	103.00	1.00	2.00	5.75
PostGun legislation	474	6.06	11.73	1.00	123.00	1.00	2.00	6.00

Table 10

Post Hoc Analysis: Chi-Square Test Statistics

	PreGun legislation	PostGun legislation
Chi-square	2419.71	2805.13
Df	33	38
Asymp. sig.	.000	.000

The chi-square output is confirmatory support for the independent samples *t*-test findings. The significance levels in both statistical processes illustrated $p < .000$ values, each exceeding the threshold of $p < .05$ values used to determine significance whether to retain or reject the null hypotheses. Crifasi et al. (2021) noted that stricter gun laws have been connected to reductions in firearm-linked morbidity and mortality and the converse is true as well. For these five Alabama counties it was demonstrated that implementation

of open carry legislation has resulted in an increase in firearm deaths likely attributed to greater ease to gun access and relaxed legislation related to open carry.

Pearson Correlation

A Pearson correlation test was conducted to examine the association strength between the PreGun and PostGun gun-related deaths including the direction of their relationship. Correlation outputs range on a scale of +/- 1.00 with 0.00 indicating no correlation. The directional value of the output indicates either a positive correlation, as one or more variables increase, so do the others, or a negative correlation, as one variable increases, the others display an inverse association. Ratner (2009) stated that coefficient values ranging from 0.7 to 1.00 indicate a strong, positive, and linear relationship between the variables. The correlation coefficient $r = .855$ indicated there was a strong positive relationship between gun related deaths and the two legislative time periods. Table 11 shows the strength results of the Pearson correlation.

Table 11

Time Period Correlation Results

		Log 10 Time Period 1	Log 10 Time Period 2
Log 10 Time Period 1	Pearson correlation	1	.855**
	Sig. (2-tailed)		<.001
	N	199	199
Log 10 Time Period 2	Pearson correlation	.855**	1
	Sig. (2-tailed)	<.001	
	N	199	220

** Correlation is significant at the 0.01 level (2-tailed).

Regression Modeling: Research Question 2 and Research Question 3

Research Question 2 and Hypotheses: Time Period 1

RQ2: Using the ADPHCHS database for 2007–2019, which pre-2013 gender and race, age distribution, and gun-related death classifications (homicide, suicide, accidental, and legal intervention) predictor illustrated significant R^2 variance in gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby?

$H_0$2: There are no gender and race, age distribution, and gun-related death classifications (homicide, suicide, accidental, and legal intervention) in the pre-2013 timeframe that illustrated significant R^2 variance in gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby.

H_a2: There are gender and race, age distribution, and gun-related death classifications (homicide, suicide, accidental, and legal intervention) in the pre-2013

timeframe that illustrated significant R^2 variance in gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby.

Using the Log10 transformed data from PreGun time period, a linear regression analysis was modeled to evaluate R^2 variance in each of the variables in the outcome of gun violence reported deaths. Categorical IVs were dummy coded in the regression models. While age, gender, and race were proposed as control variables to be entered together in Model 1, the nature of the data set frequencies added interpretation complexity; therefore, these IVs were separated into separate model entries leading with gender and race in Model 1, age in Model 2, and gun death classification in Model 3.

Model 1 illustrated that gender and race, combined as predictors, resulted in a significant change in the proportion of variance in the dependent variable (R^2_{change} = .212, F_{change} = 16.814) in a two-tailed and one-tailed output (p = < .001). Model 2 showed that age distribution, when added to gender and race, resulted in a significant change in the proportion of variance in the dependent variable (R^2_{change} = .020, F_{change} = 4.806) in a two-tailed output, and was significant when evaluating for one-tailed (p = .015). The cumulative predicative effect of these control variables accounted for 23.2% of the model change. Model 3 demonstrated that gender and race, and age distribution when added to death classifications remained significant (R^2_{change} = .076, F_{change} = 6.752). Table 12 illustrates the ANOVA table for Models 1, 2, and 3. Final consideration of all variables in the model was given using the coefficients (see Tables 12-14 and Appendix B).

Table 12

Regression Analysis for Time Period 1 Model Summary[d]

						Change Statistics			
Model	*R*	*R* square	Adjusted *R* square	Std. error of the estimate	*R* square change	*F* change	*df*1	*df*2	Sig. *F* change
1	.460[a]	.212	.199	.352	.212	16.814	3	187	<.001
2	.481[b]	.232	.215	.348	.020	4.806	1	186	.030
3	.555[c]	.308	.282	.333	.076	6.752	3	183	<.001

[a]Predictors: (Constant), GenderRace = Black and Other female, GenderRace = Black and Other male, GenderRace = White male. [b]Predictors: (Constant), GenderRace = Black and Other female, GenderRace = Black and Other male, GenderRace = White male, age distribution. [c]Predictors: (Constant), GenderRace = Black and Other female, GenderRace = Black and Other male, GenderRace = White male, age distribution, DeathClass = accidental, DeathClass = homicide, DeathClass = suicide. [d]Dependent variable: Log 10 Time Period 1.

Table 13

ANOVA[a] *Output for Time Period 1*

Model		Sum of squares	*Df*	Mean square	*F*	Sig.
1	Regression	6.248	3	2.083	16.814	<.001[b]
	Residual	23.251	188	.124		
	Total	29.500	191			
2	Regression	6.832	4	1.708	14.068	<.001[c]
	Residual	22.668	187	.121		
	Total	29.500	191			
3	Regression	9.083	7	1.298	11.676	<.001[d]
	Residual	20.417	184	.111		
	Total	29.500	191			

[a]Dependent variable: Log 10 Time Period 1. [b]Predictors: (Constant), GenderRace = Black and Other female, GenderRace = Black and Other Male, GenderRace = White male. [c]Predictors: (Constant), GenderRace = Black and Other female, GenderRace = Black and Other male, GenderRace = White male, age distribution. [d]Predictors: (Constant), GenderRace = Black and Other female, GenderRace = Black and Other male, GenderRace = White male, age distribution, DeathClass = accidental, DeathClass = homicide, DeathClass = suicide.

Table 14

ANOVA Coefficients[a] for Time Period 1

Model	Unstandardized coefficients		Standardized coefficients			95.0% confidence interval for B		Collinearity statistics	
	B	Std. error	Beta	T	Sig.	Lower bound	Upper bound	Tolerance	VIF
1 (Constant)	.57	.07		8.40	<.001	.44	.71		
GenderRace = White male	.33	.08	.42	4.27	<.001	.18	.49	.43	2.32
GenderRace = Black and Other male	.51	.08	.61	6.29	<.001	.35	.67	.44	2.25
GenderRace = Black and Other female	.03	.11	.02	.30	.77	-.19	.26	.70	1.43
2 (Constant)	.73	.10		7.31	<.001	.54	.93		
GenderRace = White male	.34	.08	.43	4.40	<.001	.19	.49	.43	2.32
GenderRace = Black and Other male	.48	.08	.57	5.83	<.001	.32	.64	.43	2.33
GenderRace = Black and Other female	-.01	.11	-.01	-.09	.93	-.24	.22	.68	1.48
Age distribution	-.03	.01	-.15	-2.19	.03	-.06	.00	.88	1.13
3 (Constant)	-.09	.61		-.14	.89	-1.30	1.12		
GenderRace = White Male	.35	.07	.44	4.72	<.001	.20	.49	.43	2.33
GenderRace = Black and Other Male	.46	.08	.55	5.59	<.001	.30	.62	.39	2.57
GenderRace = Black and Other female	-.05	.12	-.03	-.40	.69	-.27	.18	.61	1.63
Age distribution	-.04	.01	-.16	-2.44	.02	-.06	-.01	.85	1.18
DeathClass = Accidental	.35	.62	.17	.56	.58	-.88	1.57	.04	25.75
DeathClass = Suicide	.84	.61	1.07	1.37	.17	-.37	2.05	.01	160.92
DeathClass = homicide	.89	.61	1.12	1.46	.15	-.31	2.09	.01	157.56

[a]Dependent variable: Log 10 Time Period 1.

Overall, the combined contributing effect of the predictor variables accounted for 30.8% of the variance in summed frequencies of gun-related deaths in the PreGun time period (F (3, 183) = 6.752, p = < .001). Given these findings, I rejected the null hypothesis in favor of the alternate. In the overall model, being male and White or Black, and young (20-29 years of age) were significant model coefficients. Death classifications were not significant from each other to offer predictive model influence.

Research Question 3 and Hypotheses: Time Period 2

RQ3: Using the ADPHCHS database for 2007–2019, which post-2013 gender and race, age distribution, and gun-related death classifications (homicide, suicide, accidental, and legal intervention) illustrated significant R^2 variance in gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby?

$H_0$3: There are no gender and race, age distribution, and gun-related death classifications (homicide, suicide, accidental, and legal intervention) in the post-2013 timeframe that illustrated significant R^2 variance in gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby.

H_a3: There are gender and race, age distribution, and gun-related death classifications (homicide, suicide, accidental, and legal intervention) in the post-2013 timeframe that illustrated significant R^2 variance in gun-related deaths in the counties of Jefferson, Madison, Mobile, Montgomery, and Shelby.

Using the Log10 transformed data from PostGun time period, a linear regression analysis was modeled to evaluate R^2 variance in each of variables as a predictive factor in the outcome of gun violence reported deaths. Categorical IVs were dummy coded in the

regression models. Although age, gender, and race were proposed as control variables to be entered together in Model 1, the nature of the data set frequencies added interpretation complexity; therefore, these IVs were separated into separate model entries leading with gender and race in Model 1, age in Model 2, and gun death classification in Model 3.

Model 1 illustrated that gender and race, combined as predictors, resulted in a significant change in the proportion of variance in the dependent variable (R^2_{change} = .210, F_{change} = 19.195) in a two-tailed and one-tailed output (p = < .001). Model 2 demonstrated that age distribution when added to gender and race did not result in a significant change in the proportion of variance in the dependent variable (R^2_{change} = .005, F_{change} = 1.287). The cumulative predicative effect of these two variables accounted for 21.5% of the model change. Model 3 showed that gender, race, and age distribution when added to death classifications remained significant (R^2_{change} = .063, F_{change} = 6.129). Table 15 illustrates the ANOVA table for Models 1, 2, and 3. Final consideration of all variables in the model was provided using the coefficients (see Table 15-17 and Appendix C).

Table 15

Regression Analysis for Time Period 2 Model Summary[d]

							Change Statistics		
Model	*R*	*R* square	Adjusted *R* square	Std. error of the estimate	*R* square change	*F* change	*df*1	*df*2	Sig. *F* change
1	.46[a]	.21	.20	.3826	.21	19.19	3	216	<.001
2	.46[b]	.22	.20	.3823	.00	1.29	1	215	.26
3	.53[c]	.28	.25	.3693	.06	6.13	3	212	<.001

[a]Predictors: (Constant), GenderRace = Black and Other female, GenderRace = Black and Other male, GenderRace = White male. [b]Predictors: (Constant), GenderRace = Black and Other female, GenderRace = Black and Other male, GenderRace = White male, age distribution. [c]Predictors: (Constant), GenderRace = Black and Other female, GenderRace = Black and Other male, GenderRace = White male, age distribution, DeathClass = accidental, DeathClass = homicide, DeathClass = suicide. [d]Dependent variable: Log 10 Time Period 2.

Table 16

ANOVA[a] *Output for Time Period 2*

Model		Sum of squares	*Df*	Mean square	*F*	Sig.
1	Regression	8.43	3	2.81	19.19	<.001[b]
	Residual	31.62	216	.15		
	Total	40.05	219			
2	Regression	8.62	4	2.15	14.74	<.001[c]
	Residual	31.44	215	.15		
	Total	40.05	219			
3	Regression	11.13	7	1.59	11.65	<.001[d]
	Residual	28.93	212	.14		
	Total	40.05	219			

[a]Dependent variable: Log 10 Time Period 2. [b]Predictors: (Constant), GenderRace = Black and Other female, GenderRace = Black and Other male, GenderRace = White male. [c]Predictors: (Constant), GenderRace = Black and Other female, GenderRace = Black and Other male, GenderRace = White male, age distribution. [d]Predictors: (Constant), GenderRace = Black and Other female, GenderRace = Black and Other Male, GenderRace = White male, age distribution, DeathClass = accidental, DeathClass = homicide, DeathClass = suicide.

Table 17

ANOVA Coefficients[a] for Time Period 2

Model		Unstandardized coefficients		Standardized coefficients			95.0% confidence interval for B		Collinearity statistics	
		B	Std. error	Beta	*t*	Sig.	Lower bound	Upper bound	Tolerance	VIF
1	Constant	.56	.07		8.26	<.001	.43	.70		
	GenderRace = White male	.39	.08	.46	5.02	<.001	.24	.55	.44	2.29
	GenderRace = Black and Other male	.58	.08	.63	7.02	<.001	.41	.74	.45	2.21
	GenderRace = Black and Other female	.14	.11	.10	1.30	.20	-.07	.36	.67	1.50
2	Constant	.65	.10		6.31	<.001	.45	.86		
	GenderRace = White male	.40	.08	.46	5.03	<.001	.24	.55	.44	2.29
	GenderRace = Black and Other male	.56	.08	.61	6.59	<.001	.39	.72	.43	2.33
	GenderRace = Black and Other female	.11	.11	.08	1.00	.32	-.11	.33	.63	1.58
	Age distribution	-.02	.01	-.07	-1.13	.26	-.05	.01	.85	1.17
3	Constant	-.07	.40		-.19	.85	-.86	.71		
	GenderRace = White male	.39	.08	.46	5.19	<.001	.24	.54	.44	2.29
	GenderRace = Black and Other male	.52	.09	.57	6.11	<.001	.35	.69	.39	2.55
	GenderRace = Black and Other female	.04	.11	.02	.31	.75	-.19	.26	.58	1.72
	Age distribution	-.02	.01	-.09	-1.38	.17	-.05	.01	.81	1.24
	DeathClass = Accidental	.14	.43	.04	.32	.75	-.71	.99	.19	5.36
	DeathClass = Suicide	.73	.39	.86	1.87	.06	-.04	1.51	.02	61.8
	DeathClass = Homicide	.83	.39	.97	2.11	.04	.06	1.60	.02	61.5

[a]Dependent variable: Log 10 Time Period 2.

The combined contributing effect of the predictor variables accounted for 27.8% of the variance in summed frequencies of gun related deaths in the PostGun time period (F (3, 212) = 6.129, p = < .001). Given these findings, I rejected the null hypothesis in favor of the alternate. In the overall model, being male and White or Black, and the death classification of homicide were significant model coefficients. Suicide demonstrated a trend toward significance and age was no longer a significant predictor. All other predictor variables were not significant in predictive model influence.

Summary

In RQ1, I sought to evaluate the difference between gun related deaths in the PreGun time period where more restrictive gun legislation was present and the PostGun time period where open carry laws were liberalized in five Alabama counties. Results from the independent samples t test yielded a statistically significant difference (p = .000). There were more gun related deaths in the PostGun time period under the liberalized legislation than in the PreGun time period were more restrictive gun laws existed.

For RQ2, I used regression modeling to evaluate the predictive influence of gender and race, age distribution, and death classification on the number of reported gun deaths in the PreGun time period where more restrictive gun legislation was in force. The cumulative model illustrated statistical significance, with the predictor variables contributing a total of 30.8% of explainable variance. Being male, White or Black, and in the age range 20–29, were significantly associated with gun-related deaths.

For RQ3, I used regression modeling to evaluate the predictive influence of gender and race, age distribution, and death classification on the number of reported gun deaths in the PostGun time period where gun legislation, specifically open carry, was liberalized. The cumulative model demonstrated statistical significance, with the predictive variables contributing a total of 27.8% of explainable variance. Being male, White or Black, and victims of homicide were significantly associated with gun-related deaths. In the PostGun time period, age distribution was no longer a significant predictor. There was a significant upward trend with suicide, meaning more liberal gun access may be associated with higher numbers of gun-related suicides.

The Second Amendment of the U.S. Constitution provides citizens with the right to keep and bear arms. Throughout the past decade, states have continued to address gun legislation with trend toward liberalization of gun control laws. My research demonstrated that for Jefferson, Madison, Mobile, Montgomery, and Shelby counties, liberalization of Alabama's open carry gun legislation is associated with higher overall gun-related deaths among White and Black men of any age, with homicide being the leading gun-related cause of death. Chapter 5 includes findings, limitations, recommendations, and implications of the study.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this quantitative study was to provide an enhancement to the existing body of information related to firearm deaths by providing a statistically-based perspective of the open carry statute in the five most populated Alabama counties of Jefferson, Madison, Mobile, Montgomery, and Shelby. More specifically, I used a nonexperimental inferential quantitative design to examine the exact number of firearm deaths that occurred in five specific Alabama counties 6 years before (2007–2012) and 6 years after (2014–2019) implementation of the 2013 open carry gun law. Instead of investigating all 67 counties, only the five most populated were included in the study (i.e., Jefferson, Madison, Mobile, Montgomery and Shelby). To provide an extensive analysis, the following categories of mortality involving firearms were explicitly examined: homicide, suicide, accidental, and legal intervention with age, gender, and race as predictor variables. The goal was to help policymakers by providing documentation of statistical increases in firearm deaths after the enactment of the open carry statute, thereby supplying evidence for more stringent gun laws in Alabama.

For RQ1, key findings indicated a statistical significance between the PreGun and PostGun time periods. For overall firearm mortality deaths in the five Alabama counties, more deaths occurred in the PostGun time period. I rejected the null hypothesis because the results from the independent samples *t* test were statistically significant.

The null hypothesis was also rejected for RQ2. ANOVA and linear regression model evaluations were used to conclude that being younger White or Black male was associated with any firearm mortality. Homicide showed the most significant R^2 variance.

The null hypothesis for RQ3 was also rejected. As with RQ2, ANOVA and linear regression model evaluations were used for analysis. The most influential predictors associated with firearm mortality were male, White or Black, which were unchanged from the pre-carry legislative time period; however, homicide was found to contribute significantly more R^2 variance, with suicide trending toward significance. In the post-carry time period, gun related deaths for any age showed a difference in demographics from the pre-carry time period. Being female of any age or race was not significantly associated with changes in R^2 variance. In this chapter, I discuss the interpretation of the findings, limitations of the study, recommendations, implications for positive social change, and conclusions.

Interpretation of Findings

Research findings have shown that gun laws have an effect on gun violence and firearm mortality rates (Bailey, 2011; Blau et al.; Butterworth & Anestis, 2019; Chandler, 2018; Chien & Gakh, 2020; Cox, 2016; Gius, 2018; Hoskin, 2011; Husak, 2019; Liu et al., 2020; Siegel et al., 2019; Watts, 2019). The five counties that reported firearm mortality deaths for Time Period 1 were compared with the same five counties that reported firearm deaths for Time Period 2. The results showed a statistically significant difference, with more deaths reported in the PostGun open carry legislation time period. The null hypothesis for RQ1 was rejected as there was a statistically significant difference in mean death rates. The null hypotheses for RQ2 and RQ3 were also rejected as significant predictive variables attributed to changes in R^2 variance.

The study results confirm what many other researchers have noted: that gun laws have an effect on gun violence levels (see Chien & Gakh, 2020; Liu et al., 2020). Not all states have the same gun laws. States with lax or less stringent firearm laws tend to have increased gun violence and related gun deaths. Liu et al. (2020) noted that states with restrictive firearm policies experience less firearm deaths. Chien and Gakh (2020) theorized that the more gun laws states have in place and the stricter their regulations, the more likelihood firearm mortality would decrease. Chien and Gakh also found that firearm homicide rates were affected by existing state firearm laws.

My study involved the open carry gun law in Alabama. Open carry is not well represented in the literature on gun control. Wallace (2019) stated that open carry gun laws were created to increase public safety due to an unwelcome increase in concealed weapons. Gun violence has increased due to more individuals openly carrying firearms coupled with less restrictive access requirements (Blau et al., 2016; Butterworth & Anestis, 2019; Hoskin, 2011; Husak, 2019; Wallace, 2019; Watts, 2019). Open carry legislation jeopardizes the public's safety by increasing the potential risk of firearm violence (Giffords Law Center, 2022b).

My study was grounded in Beccaria's (1764/1963) rational choice theory. This theory is used by social scientists to better understand human behavior and actions (Gül, 2009). The theory's original premise is that all individuals have free will and the ability to make rational choices. Further, individuals can freely decide to participate in certain behaviors and perform actions based on their cognitive thinking (Pratt, 2008). People generally act based on their private self-interests (Fumagalli, 2021; Lovett, 2006).

During the 2007–2012 time period, the four gun death classifications did not show any significant R^2 variance. In other words, there were no significant predictive relationships between gun-related deaths and gun death classifications. During the 2014–2019 time period, homicide was found to have a significant R^2 variance, and suicide was trending toward significance. Both findings may be attributed to freer gun access and fewer social restrictions on gun concealment. Further longitudinal examination of gun-related deaths of any classification is needed for all Alabama counties in the open carry legislative era.

Limitations of the Study

There were several study limitations. Research studies that use secondary data are limited by dataset restrictions. Because I did not collect the data firsthand, the study depended on the assumption that the data were accurate and reliably reported under the defined gun mortality classifications in the ADPHCHS database. This study was also limited to the discussion of known firearm associated deaths. Not every firearm death is known to law enforcement or the coroner's office. The bodies of some victims are not always discovered, and deaths may have been incorrectly documented or classified by authorities.

I examined the five most populated metropolitan Alabama counties, leaving 62 Alabama counties absent from analyses. Therefore, the statistical findings are illustrative of experiences in limited geographic locations and may not represent open carry legislation statewide. Another limitation involved how the state of Alabama categorizes race. In the ADPHCHS database, race is aggregately labeled as White and Black and

Other, with similar aggregations based on gender. These broad classifications led to data interpretation challenges, as aggregate classifications did not lend themselves to interpretation specificity. Due to the nonspecificity of race being listed in congruence with every firearm connected death, there were data interpretation challenges.

Modifications to the statistical analyses were also required as the dataset was presented as frequency data rather than line-item entries. Given the nature of frequency data, various data weighting procedures were required during analyses, limiting which statistical tests could be accurately conducted. Had data been available in a line-item format, analyses could have been conducted on individual case entries, including outlier analyses, and a regression model for control variables could have been used.

The study was centered on the statistical analysis of numerical data and did not have a humanistic focus. This type of approach could have provided a broader analytical perspective by humanizing every firearm death. Through personalization of these numbers, community activists, elected officials, and gun advocates would have personalized information regarding the danger of firearms so they can take a stronger approach to gun control legislation. By focusing solely on the numerical data, the study lacked a human component to connect the data to potential stakeholders. As stakeholders want to feel as though their voices are being heard.

A final study limitation was that a per capita population adjustment was not taken into account in either time period analyses. Using the PreGun legislative time period as a baseline, per-capita changes in the PostGun legislative time period could have influenced firearm mortality rates, demonstrating proportional changes and not actual incidents.

Future researchers should take into consideration data adjusted to a standardized population factor across time periods when those time periods exceed census taking data reporting.

Recommendations

Further quantitative firearm research in Alabama should be conducted. A more inclusive study could be done to include examination of firearm-related gun deaths in Alabama's 67 counties. By examining the entire state, a more in-depth depiction of the statistical impact of the open carry gun law could be generated. It is important for gun policy research to be conducted at state and local levels. State level gun policies affect individuals more than those at the federal level (Liu et al., 2020; Possession of Firearms and Dangerous Weapons in Federal Facilities, 2006; Siegel et al., 2019) Local level examinations following public health principles of person, place, and time may yield information lost in aggregated databases. The results of these analyses could generate other research, such as a comparative analysis of firearm-related deaths in Alabama at community levels (rural, urban, suburban) or other geographical divisions.

Another recommendation for future research is the complete, separate analysis of the individual gun death classifications from line-item database entries. Investigating firearm-related gun death classifications of homicide, suicide, accidental, and legal intervention at individual case entry level would give researchers and policymakers a clearer illustration of firearm deaths and victim demographics to support policy change. Policy change is important as it can lead to positive social developments within communities.

A future mixed methods study including multiple data sets and stakeholder input is another recommendation. Community input as to how individuals are affected by firearm violence, interviewing elected officials whose communities have been impacted by firearm violence and deaths, and pro and antigun advocates of various demographics to gain firearm violence perspectives is important. Stakeholder input is important because it helps provide varying viewpoints as well as potential resources to aid in achieving a communal goal.

For women, gun-related death rates and classifications did not statistically differ for either time period. In the analyzed data, women in both race categories experienced gun-related mortality but there were no significant changes between the legislative time periods. Although open carry legislation offered opportunity for greater firearm access, there were no changes in gun-related mortality classifications in women. Further investigation of women and gun-related violence is warranted and could be specifically tied to domestic violence and suicide as indicated in prior firearm literature (Lockwood et al., 2023; Siegel et al., 2019; Stansfield & Semenza, 2019; Tobin-Tyler, 2023; Zeoli et al., 2020).

Finally, a comparative analysis of firearm morality rates between Alabama and other states that have implemented open carry gun laws could be conducted. The widespread quantitative analyses suggested would be beneficial in providing comparative perspectives as to how open carry legislation has affected firearm mortality rates across states with varying geopolitical demographics. A multistate comparative analysis of this

nature could be beneficial to policymakers and other stakeholders in demonstrating how different demographics from other states have been affected by their open carry gun laws.

Implications

There is an opportunity to improve the lives of individuals residing in Alabama through the reduction of gun violence and firearm mortality. Several researchers have determined that strong state gun policies are connected to lower firearm mortality rates (Liu et al., 2020; Siegel et al., 2019). Through this study, I investigated the effects of the implementation of Alabama's open carry gun law on all firearm-related deaths within Jefferson, Madison, Mobile, Montgomery and Shelby counties. Results for RQ1 demonstrated that the implementation of the open carry gun law has led to a statistically significant increase in all death classifications involving firearms. This finding alone should concern citizens and policymakers as the liberalization of gun carry legislation enacted in 2013 is negatively impacting Alabamians and their communities.

Statistical analyses demonstrated that White and Black males are suffering from firearm violence specifically, homicide by firearm, with more deaths occurring in the age groups of 20 to 29 and 30 to 39 in the PostGun legislation time period. This differs from the PreGun time period where White and Black men tended to be younger with more firearm deaths in the age groups 10 to 19 and 20 to 29. The current open carry gun law has demonstrated how the Black community is disproportionately affected by this law. Community leaders, firearm safety advocates, church leaders, and other leaders need to embrace and embark on a sustained pathway to gain communal support to send a unified

message to legislative policymakers that liberalized gun control policies are and will continue to lead to gun-related violence and mortality.

The collection and analysis of data provide an opportunity for positive social change for Alabama policymakers when evaluating the effects of this 2013 open carry legislative change on gun-related violence. This information indicates that liberalization of open gun carry legislation has a detrimental effect on society and the open carry legislation is worthy of further policy evaluation. Bringing these results to the attention of policymakers and gun control lobbyists may help promote positive social change as a data-driven foundation for dialogue on the development of sensible firearm policies, which may curb gun-related violence. Positive social change will require a communal effort. Effective societal change is possible in Alabama when the concerned citizens and policymakers work together to change the current liberal gun control laws while balancing Second Amendment rights.

The multifaceted issue of gun control requires that policymakers think of strategic and possibly unorthodox ways to address this problem. The field of public policy should be at the forefront in the reduction of firearm violence and deaths as this field concerns the government and provides purposive actions that address public concern. For this reason, it is imperative for all levels of government to recognize citizen concern as it relates to gun control.

Conclusion

Countless aspects of gun violence have been studied because it affects daily life. Numerous gun control laws have been implemented, with firearm violence a nationwide

public health issue. Nevertheless, these laws may remain less effective as they are not enforced equally among the states. Soaring levels of gun violence have escalated the need for further gun control research (Jang, 2019; Ndikum, 2018). Although gun research is extensive, studies regarding open carry are scarce (Wallace, 2019), often qualitative, and centered on an individual's feelings or perceptions of open carry. Previous research has failed to address the open carry gun law using quantitative methodology in Alabama. For this reason, it was imperative that a study be conducted on open carry using a quantitative design. Examining open carry using this methodology allowed the me to provide a numerical fact-based representation of how the open carry law has contributed to the increase in firearm-related deaths in the five most populated counties in Alabama.

This firearm study was unique in that my focus was solely on an individual state, and specific counties within the state jurisdiction, using a comparative analysis of gun related deaths in conjunction with the application of the open carry gun law. This study's data contributed to the research literature by providing policymakers with information as new gun laws are created as well as when current gun laws are reviewed and revised. Contributing quality firearm research is vital. More quantitative open carry gun law research is needed as it can provide lawmakers, community activists, and gun lobbyists with a more transparent, factual view of how this particular firearm law effects gun violence and mortality rates.

The state of Alabama has liberalized gun-related laws and policies. Evidence suggests that having liberal gun possession laws leads to more firearm violence and increased firearm deaths. The need for more stringent gun control laws is imperative.

More studies should be conducted regarding the open carry gun law and its ramifications. The more individuals have access to firearms in association with the legal ability to possess them openly may lead to more firearm violence and danger. One of the better ways to provide protection to society is for policymakers to create and enact stronger gun laws. The need for legislative action is apparent; without it, Alabama citizens, specifically White and Black males, will continue to suffer from increased gun violence and death rates. It is important for all citizens to work in conjunction with policymakers toward creating stronger gun control laws that are sustainable.

References

Alabama Department of Public Health Center for Health Statistics. (n.d.-a). *Alabama vital statistics 2007*. https://www.alabamapublichealth.gov/healthstats/assets/avs2007.pdf

Alabama Department of Public Health Center for Health Statistics. (n.d.-b). *Alabama vital statistics 2008*. https://www.alabamapublichealth.gov/healthstats/assets/avs2008.pdf

Alabama Department of Public Health Center for Health Statistics. (n.d.-c). *Alabama vital statistics 2010*. https://www.alabamapublichealth.gov/healthstats/assets/avs2010.pdf

Alabama Department of Public Health Center for Health Statistics. (n.d.-d). *Alabama vital statistics 2012*. https://www.alabamapublichealth.gov/healthstats/assets/avs2012.pdf

Alabama Department of Public Health Center for Health Statistics. (n.d.-e). *Alabama vital statistics 2014*. https://www.alabamapublichealth.gov/healthstats/assets/avs2014.pdf

Alabama Department of Public Health Center for Health Statistics. (n.d.-f). *Alabama vital statistics 2015*. https://www.alabamapublichealth.gov/healthstats/assets/avs2015.pdf

Alabama Department of Public Health Center for Health Statistics. (n.d.-g). *Alabama vital statistics 2016*. https://www.alabamapublichealth.gov/healthstats/assets/avs2016.pdf

Alabama Department of Public Health Center for Health Statistics. (n.d.-h). *Alabama vital statistics 2017*. https://www.alabamapublichealth.gov/healthstats/assets/avs2017.pdf

Alabama Department of Public Health Center for Health Statistics. (n.d.-i). *Alabama vital statistics 2018*. https://www.alabamapublichealth.gov/healthstats/assets/AVS2018.pdf

Alabama Department of Public Health Center for Health Statistics. (n.d.-j). *2019: 113 causes of death by residence, race and sex*. https://www.alabamapublichealth.gov/healthstats/assets/113causes_2019.pdf

Alabama Department of Public Health Center for Health Statistics. (2010, November). *Alabama vital statistics 2009*. https://www.alabamapublichealth.gov/healthstats/assets/avs2009.pdf

Alabama Department of Public Health Center for Health Statistics. (2013, January). *Alabama vital statistics 2011*. https://www.alabamapublichealth.gov/healthstats/assets/avs2011.pdf

Alabama Department of Public Health Center for Health Statistics. (2015, January). *Alabama vital statistics 2013*. https://www.alabamapublichealth.gov/healthstats/assets/avs2013.pdf

Alabama Department of Public Health Center for Health Statistics. (2021, February). *Vital statistics at a glance: Alabama 2019*. https://www.alabamapublichealth.gov/healthstats/assets/ataglance2019.pdf

American Medical Association. (2022). Preventing violence. https://www.ama-

assn.org/delivering-care/public-health/preventing-violence

Anestis, M. D., Anestis, J. C., & Butterworth, S. E. (2017). Handgun legislation and changes in statewide overall suicide rates. *American Journal of Public Health, 107*(4), 579–581. https://doi.org/10.2105/AJPH.2016.303650

Arsovska, J., & Kostakos, P. (2008). Illicit arms trafficking and the limits of rational choice theory: The case of the Balkans. *Trends in Organized Crime*, *11*(4), 352–378. https://doi.org/10.1007/s12117-008-9052-y

Bailey, A. A. (2011). *Traumatic stress, social support, cognitive appraisal, and resiliency among black women experiencing gun violence loss* (Publication No. 3439669) [Doctoral dissertation, Walden University]. ProQuest Dissertations Publishing.

Barao, L., Braga, A. A., Turchan, B., & Cook, P. J. (2021). Clearing gang-and drug-involved nonfatal shootings. *Policing: An International Journal*, *44*(4), 577–590.

Beccaria, C. (1963). *On crimes and punishments* (H. Paolucci, Trans). Bobbs-Merrill. (Original work published 1764)

Beccaria, C. (2009). *On crimes and punishments and other writings* (A. Thomas, Ed.; J. Parzen, Trans). University of Toronto Press.

Berk, R. A. (2022). Causal inference challenges with interrupted time series designs: An evaluation of an assault weapons ban in California. *Observational Studies*, *8*(1), 1–22. https://doi.org/10.1353/obs.0.0001

Bilgel, F. (2020). State gun control law, gun ownership and the supply of homicide organ donors. *International Review of Law and Economics*, *63*, Article 105925. https://doi.org/10.1016/j.irle.2020.105925

Blau, B. M., Gorry, D. H., & Wade, C. (2016). Guns, laws and public shootings in the United States. *Applied Economics*, *48*(49), 4732–4746. https://doi.org/10.1080/00036846.2016.1164821

Boehme, H. M., Kaminski, R. J., & Leasure, P. (2022). A comparative interrupted time-series assessing the impact of the Armstrong decision on officer-involved shootings. *Police Practice and Research*, *23*(5), 1–9. https://doi.org/10.1080/15614263.2022.2079508

Boehme, H. M., Kaminski, R. J., & Nolan, M. S. (2022). City-wide firearm violence spikes in Minneapolis following the murder of George Floyd: A comparative time-series analysis of three cities. *Urban Science*, *6*(16), 1–7. https://doi.org/10.3390/urbansci6010016

Bokhove, C. (2022). The role of analytical variability in secondary data replications: A replication of Kim et al. (2014). *Educational Research and Evaluation*, *27*(1–2), 141-163. https://doi.org/10.1080/13803611.2021.2022319.

Bottcher, L., D'Orsogna, M. R., & Chou, T. (2022). A statistical model of COVID-19 testing in populations: Effects of sampling bias and testing errors. *Philosophical Transactions of the Royal Society*, *380*(2214). Article 20210121. https://doi.org/10.1098/rsta.2021.0121

Brady Campaign to Prevent Gun Violence. (2015). *Gun violence statistics*. http://www.bradycampaign.org/key-gun-violence-statistics

Butterworth, S. E., & Anestis, M. D. (2019). Political beliefs, region of residence, and openness to firearm means safety measures to prevent suicide. *Archives of Suicide*

Research, *23*(4), 616–633. https://doi.org/10.1080/13811118.2018.1486250

Carrying Concealed Weapons, Ala. Code § 13A-11-50 (1975 & rev. 2022). https://casetext.com/statute/code-of-alabama/title-13a-criminal-code/chapter-11-offenses-against-public-order-and-safety/article-3-offenses-relating-to-firearms-and-weapons/division-1-general-provisions/section-13a-11-50-effective112023carrying-concealed-weapons

Carson, J. V., Dugan, L., & Yang, S.-M. (2019). A comprehensive application of rational choice theory: How costs imposed by, and benefits derived from, the U.S. federal government affect incidents perpetrated by the radical eco-movement. *Journal of Quantitative Criminology*, *36*(3), 701–724. https://doi.org/10.1007/s10940-019-09427-8

Carter, J. G., & Binder, M. (2018). Firearm violence and effects on concealed gun carrying: large debate and small effects. *Journal of Interpersonal Violence*, *33*(19), 3025–3052. https://doi.org/10.1177/0886260516633608

Carter, P. M., Losman, E., Roche, J. S., Malani, P. N., Kullgren, J. T., Solway, E., Kirch, M., Singer, D., Walton, M. A., Zeoli, A. M., & Cunningham, R. M. (2022). Firearm ownership, attitudes, and safe storage practices among a nationally representative sample of older U.S. adults age 50 to 80. *Preventive Medicine*, *156*, Article 106955. https://doi.org/10.1016/j.ypmed.2022.106955

Centers for Disease Control and Prevention. (2018). *Firearm mortality by state*. https://www.cdc.gov/nchs/pressroom/sosmap/firearm_mortality/firearm.htm

Chandler, P. L. (2018). *A descriptive examination of African American juveniles,*

community variable, and deviant behavior (Publication No. 10747764) [Doctoral dissertation, Saint Thomas University]. ProQuest Dissertations Publishing.

Chien, L. C., & Gakh, M. (2020). The lagged effect of state gun laws on the reduction of state-level firearm homicide mortality in the United States from 999 to 2017. *Public Health*, *189*, 73–80. https://doi.org/10.1016/j.puhe.2020.08.028

Clark, E. L., II. (2017). *Impact of stand your ground on gun behavior and likelihood to use deadly force with presumption of fear in Florida* (Publication No. 10642627) [Doctoral dissertation, Florida Agricultural and Mechanical University]. ProQuest Dissertations Publishing.

Collings, A. T., Farazi, M., Van Arendonk, K. J., Fallat, M. E., Minneci, P. C., Sato, T. T., Speck, K. E., Deans, K. J., Falcone, R. A., Jr., Foley, D. S., Fraser, J. D., Gadepalli, S. K., Keller, M. S., Kotagal, M., Landman, M. P., Leys, C. M., Markel, T. A., Rubaclava, N., St. Peter, S. D., Flynn-O'Brien, K. T. (2022). The COVID-19 pandemic and associated rise in pediatric firearm injuries: A multi-institutional study. *Journal of Pediatric Surgery*, *57*(7), 1370–1376. https://doi.org/10.1016/j.jpedsurg.2022.03.034

Cook, P. J. (2018). Challenge of firearms control in a free society. *Criminology and Public Policy*, *17*(2), 437–451. https://doi.org/10.1111/1745-9133.12359

Cook, P. J. (2020). Thinking about gun violence. *Criminology and Public Policy*, *19*(4), 1371-1393. https://doi.org/10.1111/1745-9133.12519

Corburn, J., Nidam, Y., & Fukutome-Lopez, A. (2022). The art and science of urban gun violence reduction: Evidence from the advance peace program in Sacramento,

California. *Urban Science*, *6*(6), 1-16. https://doi.org/10.3390/urbansci6010006

Cox, A. (2016). *The impact of post traumatic stress disorder on recurrent violent behavior among African American males* (Publication No. 10103092) [Doctoral dissertation, Walden University]. ProQuest Dissertations Publishing.

Crifasi, C. K., Ward, J. A., McGinty, E. E., Webster, D. W., & Barry, C. L. (2021). Public opinion on gun policy by race and gun ownership status. *Preventive Medicine*, *149*, Article 106607. https://doi.org/10.1016/j.ypmed.2021.106607

Dealers' Licenses–Required, Ala. Code § 13A-11-78 (1975). https://www.alabamaag.gov/Documents/firearms/File-Alabama-Weapon-Laws.pdf

Degli Esposti, M., Wiebe, D. J., Gasparrini, A., & Humphreys, D. K. (2022). Analysis of "stand your ground" self-defense laws and statewide rates of homicides and firearm homicides. *JAMA Network Open*, *5*(2), 1–12. https://doi.org/10.1001/jamanetworkopen.2022.0077

Denzin, N. K. (1990). Reading rational choice theory. *Rationality and Society*, *2*(2), 172–189. https://doi.org/10.1177/1043463190002002006

Dietrich, F., & List, C. (2013). A reason-based theory of rational choice. *Nous*, *47*(1), 104–134. https://doi.org/10.1111/j.1468-0068.2011.00840.x

Disorderly Conduct, Ala. Code §13A-11-7c (1975 & rev. 2013). https://law.justia.com/codes/alabama/2013/title-13a/chapter-11/section-13a-11-7#:~:text=(a)%20A%20person%20commits%20the,(2)%20Makes%20unreasonable%20noise

District of Columbia v. Heller, 554 U.S. 570 (2008). https://supreme.justia.com/cases/federal/us/554/570/

Dobaria, V., Aguayo, E., Sanaiha, Y., Tran, Z., Hadaya, J., Sareh, S., Cho, N. Y., & Benharash, P. (2020). National trends and cost burden of surgically treated gunshot wounds in the US. *Journal of the American College of Surgeons*, *231*(4), 448–459. https://doi.org/10.1016/j.jamcollsurg.2020.06.022

Dowding, K., & Hindmoor, A. (1997). The usual suspects: Rational choice, socialism, and political theory. *New Political Economy*, *2*(3), 451–463. https://doi.org/10.1080/13563469708406317

Educational Fund to Stop Gun Violence. (2018). *New CDC data show that nearly 40,000 people died by guns in 2017* [Press Release]. https://efsgv.org/press-archive/2018/cdc-shows-increase-in-gun-deaths-in-2017/

Educational Fund to Stop Gun Violence. (2020). *Alabama gun deaths: 2019*. https://efsgv.org/state/alabama/

Educational Fund to Stop Gun Violence. (2021). *Firearm homicide*. https://efsgv.org/learn/type-of-gun-violence/firearm-homicide/

Federal Bureau of Investigation. (2019). *Crime in the United States: Violent crime*. https://ucr.fbi.gov/crime-in-the-u.s/2019/crime-in-the-u.s.-2019/topic-pages/violent-crime

Federal Bureau of Investigation. (2022). *Active shooter incidents in the United States in 2021*. https://www.fbi.gov/file-repository/active-shooter-incidents-in-the-us-2021-052422.pdf/view

Fleegler, E. W., Lee, L. K., Monuteaux, M. C., Hemenway, D., & Mannix, R. (2013). Firearm legislation and firearm-related fatalities in the United States. *Journal of American Medical Association of Internal Medicine*, *173*(9), 732–740. https://doi.org/10.1001/jamainternmed.2013.1286

Fleming, A., McLean, D. S., & Tatalovich, R. (2018). Debating gun control in Canada and the United States: Divergent policy frames and political cultures. *World Affairs*, *181*(4), 348–371. https://doi.org/10.1177/0043820018812609

Flippin, M. R., Katz, C. M., & King, W. R. (2022). Examining the impact of a crime gun intelligence center. *Journal of Forensic Sciences*, *67*(2), 543–549. https://doi.org/10.1111/1556-4029.14952

Fumagalli, R. (2020). How thin rational choice theory explains choices. *Studies in History and Philosophy of Science*, *83*, 63–74. https://doi.org/10.1016/j.shpsa.2020.03.003

Fumagalli, R. (2021). Rationality, preference satisfaction and anomalous intentions: Why rational choice theory is not self-defeating. *Theory and Decision*, *91*, 337–356. https://doi.org/10.1007/s11238-021-09801-8

Giffords Law Center. (2022a). *Concealed carry in Alabama.* https://giffords.org/lawcenter /state-laws/concealed-carry-in-alabama/

Giffords Law Center. (2022b). *Open carry*. https://giffords.org/lawcenter/gun-laws/policy-areas/guns-in-public/open-carry/

Gius, M. (2018). The effects of state and federal gun control laws on school shootings. *Applied Economics Letters*, *25*(5), 317–320.

https://doi.org/10.1080/13504851.2017.1319555

Glen, S. (2022). *Non-probability sampling: Definition, types*. Statistics How To https://www.statisticshowto.com/probability-and-statistics/sampling-in-statistics/non-probability-sampling/

Grant, C., & Osanloo, A. (2014). Understanding, selecting, and integrating a theoretical framework in dissertation research: Creating the blueprint for your house. *Administrative Issues Journal*, *4*(2), Article 4. https://doi.org/10.5929/2014.4.2.9

Gül, S. (2009). An evaluation of the rational choice theory in criminology. *Girne American University Journal of Social and Applied Science*, *4*(8), 36–44. https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.856.8815&rep=rep1&type=pdf

Gun Control Act of 1968. 18 U.S.C. § 921 et seq. (1968). https://www.govinfo.gov/content/pkg/STATUTE-82/pdf/STATUTE-82-Pg1213-2.pdf

Hayward, K. (2007). Situational crime prevention and its discontents: Rational choice theory versus the 'culture of now.' *Social Policy and Administration*, *41*(3), 232–250. https://doi.org/10.1111/j.1467-9515.2007.00550.x

Hechter, M. (1994). The role of values in rational choice theory. *Rationality and Society*, *6*(3), 318–333. https://doi.org/10.1177%2F1043463194006003003

Hechter, M., & Friedman, D. (1983). Does rational choice theory suffice? *International Migration Review*, *17*(3), 550-558.

Hellenbach, M., Elliott, S., Jeane Gerard, F., Crookes, B., Stamos, T., Poole, H., &

Bowen, E. (2018). The detection and policing of gun crime: Challenges to the effective policing of gun crime in Europe. *European Journal of Criminology*, *15*(2), 172–196. https://doi.org/10.1177%2F1477370816686122

Hepburn, L., Azrael, D., & Miller, M. (2022). Firearm background checks in states with and without background check laws. *American Journal of Preventive Medicine*, *62*(2), 227–233. https://doi.org/10.1016/j.amepre.2021.08.013

Hill, T. D., Dowd-Arrow, B., Ellison, C. G., Hale, L., McFarland, M., & Burdette, A. M. (2022). Gun ownership, community stress, and sleep disturbance in America. *Sleep Health*, *8*(2), 161–166. https://doi.org/10.1016/j.sleh.2021.11.005

Hodges, H. J. (2017). *Weapon-involved violence and mental illness: An empirical examination of the policy assumptions for firearm and other dangerous weapon prohibitions* (Publication No. 10616632) [Doctoral dissertation, The University of Nebraska, Lincoln]. ProQuest Dissertations Publishing.

Hoskin, A. (2011). Household gun prevalence and rates of violent crime: A test of competing gun theories. *Criminal Justice Studies*, *24*(1), 125–136. https://doi.org/10.1080/1478601x.2011.544445

Howard, J. (2018, December 14). *Gun deaths in the US reach highest level in nearly 40 years*. CNN. https://www.cnn.com/2018/12/13/health/gun-deaths-highest-40-years-cdc/index.html

Hudik, M. (2019). Two interpretations of the rational choice theory and the relevance of behavioral critique. *Rationality and Society*, *31*(4), 464–489. https://doi.org/10.1177/1043463119869007

Husak, D. (2019). Why gun control is so hard. *Criminal Justice Ethics*, *38*(1), 55–64. https://doi.org/10.1080/0731129x.2019.1603875

Iwama, J., & McDevitt, J. (2021). Rising gun sales in the wake of mass shootings and gun legislation. *The Journal of Primary Prevention*, *42*(1), 27–42. https://doi.org/10.1007/s10935-021-00622-7

Jang, S. M. (2019). Mass shootings backfire: The boomerang effects of death concerns on policy attitudes. *Media Psychology*, *22*(2), 298–322. https://doi.org/10.1080/15213269.2017.1421471

Jones, H. E., & Horan, S. M. (2019). Guns on campus: Campus carry and instructor-student communication. *Communication Education*, *68*(4), 417–437. https://doi.org/10.1080/03634523.2019.1643899

Jones, Z. K. (2019). *Mixed methods analysis of determinants of gun ownership: Comparing social determinants, self-protection, and masculinity* (Publication No. 13903693) [Doctoral dissertation, University of South Alabama]. ProQuest Dissertations Publishing.

Kaufman, E. J., Morrison, C. N., Branas, C. C., & Wiebe, D. J. (2018). State firearm laws and interstate firearm deaths from homicide and suicide in the United States: A cross-sectional analysis of data by county. *Journal of American Medical Association Internal Medicine*, *178*(5), 692–700. https://doi.org/10.1001/jamainternmed.2018.0190

Kaufman, E. J., Passman, J. E., Jacoby, S. F., Holena, D. N., Seamon, M. J., MacMillan, J., & Beard, J. H. (2020). Making the news: Victim characteristics associated with

media reporting on firearm injury. *Preventive Medicine*, *141*, 1–6. https://doi.org/10.1016/j.ypmed.2020.106275

Keil, S., Beardslee, J., Schubert, C., Mulvey, E., & Pardini, D. (2020). Perceived gun access and gun carrying among male adolescent offenders. *Youth Violence and Juvenile Justice*, *18*(2), 179–195. https://doi.org/10.1177%2F1541204019865312

Kim, D. Y. (2022). The impact of COVID-19 on gun violence across census tracts in NYC. *Homicide Studies*, *26*(4), 379–402. https://doi.org/10.1177/10887679221077036

Koppel, S., Capellan, J. A., & Sharp, J. (2022). Disentangling the impact of Covid-19: An interrupted time series analysis of crime in New York City. *American Journal of Criminal Justice*, 1–27. https://doi.org/10.1007/s12103-021-09666-1

Laerd Statistics. (n.d.-a). *Measures of central tendency.* https://statistics.laerd.com/statistical-guides/measures-central-tendency-mean-mode-median.php

Light, M., & Slonimerov, E. (2020). How gun control policies evolve: Gun culture, 'gunscapes' and political contingency in post-Soviet Georgia. *Theoretical Criminology*, *24*(4), 590–611. https://doi.org/10.1177%2F1362480618822832

Liu, Y., Siegel, M., & Sen, B. (2020). Neighbors do matter: Between-state firearm laws and state firearm-related deaths in the U.S., 2000-2017. *American Journal of Preventive Medicine*, *59*(5), 648–657. https://doi.org/10.1016/j.amepre.2020.06.022

Lockwood, K., Rowe, C., & Sager, E. (2023). Policy recommendations to address the

nexus of domestic violence and gun violence. *North Carolina Medical Journal*, *84*(4). https://doi.org/10.18043/001c.81269

Lovett, F. (2006). Rational choice theory and explanation. *Rationality and Society, 18*(2), 237–272. https://doi.org/ 10.1177/1043463106060155

Luca, M., Malhotra, D., & Poliquin, C. (2019). The impact of mass shootings on gun policy. *Journal of Public Economics*, *181*, 1–20. https://doi.org/10.1016/j.jpubeco.2019.104083

Manski, C. F., & Pepper, J. V. (2018). How do right-to-carry laws affect crime rates? Coping with ambiguity using bounded-variation assumptions. *Review of Economics and Statistics*, *100*(2), 232–244. https://doi.org/10.1162/REST_a_00689

Martin, A. J., Collie, R. J., Durksen, T. L., Burns, E. C., Bostwick, K. C., & Tarbetsky, A. L. (2019). Growth goals and growth mindset from a methodological-synergistic perspective: lessons learned from a quantitative correlational research program. *International Journal of Research and Method in Education*, *42*(2), 204–219. https://doi.org/10.1080/1743727X.2018.1481938

Molina, R. Y. (2021). *Gun control: Republican views for common ground* (Publication No. 28773823) [Doctoral dissertation, Walden University]. ProQuest Dissertations Publishing.

Murhega, R. B., Budema, P. M., Tshimbombu, T. N., Toha, G. K., Cikomola, F. G., Mudekereza, P. S., Mubenga, L., Balemba, G. M., Badesire, D. C., Negida, A., & Kanmounye, U. S. (2022). Firearms injuries among children due to the Kivu

conflict from 2017 to 2020: A hospital-based retrospective descriptive cohort study. *African Journal of Emergency Medicine*, *12*(1), 44–47. https://doi.org/10.1016/j.afjem.2021.11.006

National Firearms Act of 1934, 26 U.S.C. § 5849 (1934). https://www.atf.gov/file/58141/download

Ndikum, C. (2018). *Perceptions of people's experiences regarding gun violence* (Publication No. 10828073) [Doctoral dissertation, Walden University]. ProQuest Dissertations Publishing.

Neal, P. (1988). Hobbes and rational choice theory. *Western Political Quarterly*, *41*(4), 635–652. https://doi.org/10.1177%2F106591298804100403

Onwuka, S. C. (2020). *Firearm restriction and its impact in reducing violent crimes in California* (Publication No. 28092254) [Doctoral dissertation, Walden University]. ProQuest Dissertations Publishing.

Orr, R. M., Rofe, A., Hinton, B., Dawes, J., Greco, G., & Lockie, R. (2021). Effect of grip size and grip strength on pistol marksmanship in police officers: A pilot study. *NBP. Journal of Criminalistics and Law*, *26*(1). 61–72. https://doi.org/10.5937/nabepo26-32292

Possession of Firearms and Dangerous Weapons in Federal Facilities U.S.C. § 930 (2006). https://www.govinfo.gov/content/pkg/USCODE-2011-title18/pdf/USCODE-2011-title18-partI-chap44-sec930.pdf

Permit to Carry Pistol in Vehicle or Concealed on Person—Required; Possession of Unloaded Pistol in Motor Vehicle, Ala. Code § 13A-11-73 (1975 & rev 2013).

https://www.alabamaag.gov/Documents/firearms/File-Alabama-Weapon-Laws.pdf

Possession of Firearms in Certain Places, Ala. Code § 13A-11-61.2 (1975 & rev. 2018). https://casetext.com/statute/code-of-alabama/title-13a-criminal-code/chapter-11-offenses-against-public-order-and-safety/article-3-offenses-relating-to-firearms-and-weapons/division-1-general-provisions/section-13a-11-612-effective-until112023possession-of-firearms-in-certain-places

Pratt, T. C. (2008). Rational choice theory, crime control policy, and criminological relevance. *Criminology and Public Policy*, *7*(1), 43–52.

Ranganathan, P., Pramesh, C. S., & Aggarwal, R. (2017). Common pitfalls in statistical analysis: Logistic regression. *Perspectives in Clinical Research*, *8*(3), 148–151. https://doi.org/10.4103/picr.PICR_87_17

Ratner, B. (2009). The correlation coefficient: Its values range between +1/-1, or do they? *Journal of Targeting, Measurement, and Analysis for Marketing*, *17*, 139–142. https://doi.org/10.1057/jt.2009.5

Rivara, F. P., Studdert, D. M., & Wintemute, G. J. (2018). Firearm-related mortality: A global public health problem [Editorial]. *JAMA Network Open*, *320*(8), 764–765. https://doi.org/10.1001/jama.2018.9942

Rourke, K. (2017). *Resisting democratic transition through terrorism: Case study of post-Saddam Hussein Iraq* (Publication No. 10267355) [Doctoral dissertation, Walden University]. ProQuest Dissertations Publishing.

Runkle, T. (2016). *Penalty enhancement laws and the reporting of patient assaults of*

emergency department nurses (Publication No. 10250221) [Doctoral dissertation, Walden University]. ProQuest Dissertations Publishing

Rutar, T. (2019). For an integrative theory of social behaviour: Theorising with and beyond rational choice theory. *Journal for the Theory of Social Behaviour*, *49*(3), 298–311. https://doi.org/10.1111/jtsb.12204

Ryan, A. L., & Gallupe, O. (2020). Dine and dash: An exploratory application of three criminological theories. *Deviant Behavior*, 1–15. https://doi.org/10.1080/01639625.2020.1787762

Semenza, D. C., Griffiths, E., Xu, J., & Stansfield, R. (2022). Firearms dealers and local gun violence: A street network analysis of shootings and concentrated disadvantage in Atlanta. *Journal of Research in Crime and Delinquency*, *59*(5), 627–658. https://doi.org/10.1177%2F00224278221077626

Semenza, D. C., Stansfield, R., & Link, N. W. (2020). The dynamic of race, place, and homicide context in the relationship between firearm dealers and gun violence. *Justice Quarterly*, *39*(1), 134–151. https://doi.org/10.1080/07418825.2019.1707858

Siegel, M., Pahn, M., Xuan, Z., Fleegler, E., & Hemenway, D. (2019). The impact of state firearm laws on homicide and suicide deaths in the USA, 1991–2016: A panel study. *Journal of General Internal Medicine*, *34*(10), 2021–2028. https://doi.org/10.1007/s11606-019-04922-x

Sokol, R. L., Kumodzi, T., Cunningham, R. M., Resnicow, K., Steiger, M., Walton, M.,Zimmerman, M. A., & Carter, P. M. (2022). The association between

perceived community violence, police bias, race, and firearm carriage among urban adolescents and young adults. *Preventive Medicine, 154,* Article 106897. https://doi.org/10.1016/j.ypmed.2021.106897

Stansfield, R., & Semenza, D. (2019). Licensed firearm dealer availability and intimate partner homicide: A multilevel analysis in sixteen states. *Preventive Medicine, 126*, Article 105739. https://doi.org/10.1016/j.ypmed.2019.05.027

Sun, S., Cao, W., Ge, Y., Siegel, M., & Wellenius, G. A. (2022). Analysis of firearm violence during the COVID-19 pandemic in the US. *JAMA Network Open 5*(4), Article e229393. https://doi.org/10.1001/jamanetworkopen.2022.9393

Thomas, K. J., Baumer, E. P., & Loughran, T. A. (2022). Structural predictors of choice: Testing a multilevel rational choice theory of crime. *Criminology*, 1–31. https://doi.org/10.1111/1745-9125.12314.

Thomas, K. J., Loughran, T. A., & Hamilton, B. C. (2020). Perceived arrest risk, psychic rewards, and offense specialization: A partial test of rational choice theory. *Criminology*, *58*(3), 485–509. https://doi.org/10.1111/1745-9125.12243

Tobin-Tyler, E. (2023). Intimate partner violence, firearm injuries and homicides: A health justice approach to two intersecting public health crises. *Journal of Law, Medicine & Ethics*, *51*(1), 64–76. https://doi.org/10.1017/jme.2023.41

Tuason, M. T., & Güss, C. D. (2020). Gun violence in the United States in 2017 and the role of mental illness. *Behavioral Sciences of Terrorism and Political Aggression*, *12*(3), 231–242. https://doi.org/10.1080/19434472.2019.1687561.

U.S. Const. amend. II.

United States v. Miller, 307 U.S. 174 (1939). https://supreme.justia.com/cases/federal/us/307/174/

Vaughn, P. E., Williams, J. H., Rosenfeld, R., & Deckard, M. (2022). Minority victim neglect and the case of processing of firearm crimes. *Victims & Offenders*, 1–24. https://doi.org/10.1080/15564886.2022.2062081

Vickerstaff, V., Omar, R., & Ambler, G. (2019). Methods to adjust for multiple comparisons in the analysis and sample size calculation of randomized controlled trials with multiple primary outcomes. *BMC Medical Research Methodology*, *19*, Article 129. https://doi.org/10.1186/s12874-019-0754-4

Wallace, L. (2017). Concealed ownership: Americans' perceived comfort sharing gun ownership status with others. *Sociological Spectrum*, *37*(5), 267–281. https://doi.org/10.1080/02732173.2017.1348278

Wallace, L. (2019). Implied threat or part of the scenery: Americans' perceptions of open carry. *Journal of Risk Research, 22*(7), 817–832. https://doi.org/10.1080/13669877.2017.1422781

Warner, R. M. (2013). *Applied statistics: From bivariate through multivariate techniques* (2nd ed.). SAGE Publications.

Watts, S. J. (2019). Gun carrying and gun victimization among American adolescents: A fresh look at a nationally representative sample. *Victims and Offenders*, *14(*1), 1–14. https://doi.org/10.1080/15564886.2018.1536005

Wu, J. (2022). Mental illness and mass shootings: A quantitative treatment of risk factors and mitigation strategies. In *2021 International Conference on Public Art and*

Human Development (ICPAHD 2021) (pp. 1012–1017). Atlantis Press.

Zeoli, A. M., Malinski, R., & Brenner, H. (2020). The intersection of firearms and intimate Partner homicide in 15 nations. *Trauma, Violence, and Abuse*, *21*(1), 45–56. https://doi.org/10.1177%2F1524838017738725

Appendix A: Institutional Review Board Certificate

CITI PROGRAM

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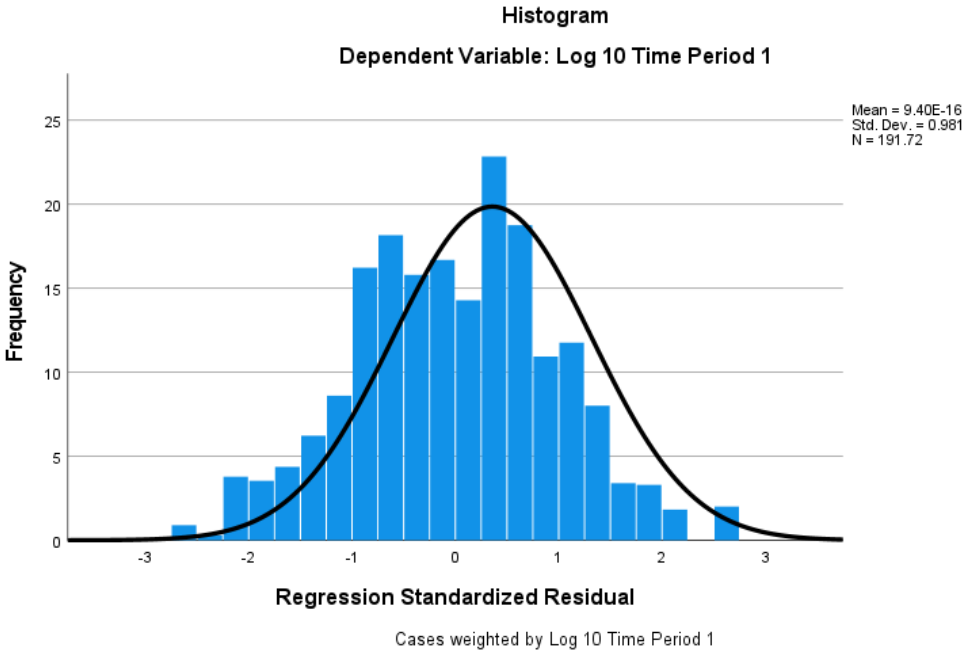
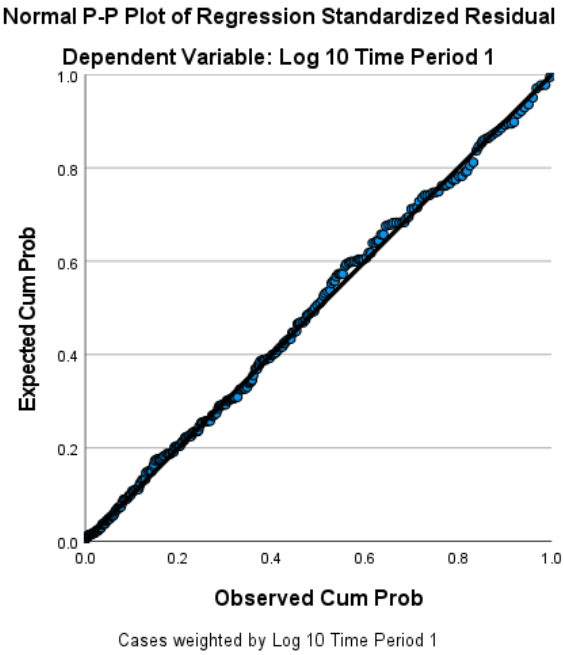
Appendix B: Regression Charts for Time Period 1





Appendix C: Regression Charts for Time Period 2