DO YOU SEE WHAT I SEE?

Does Modeled Violence in the Top Ten Films have a relationship with Societal Violence.

Adrian Varallyay

Master's Thesis 2023
Columbia University
The Institute for Social and Economic Research and Policy
Quantitative Methods in the Social Sciences

Abstract

Cultural patterns evolve and decline over time, reflecting changing values and attitudes of a particular society. Movies both capture and shape cultures, impacting moral values and attitudes, shaping cultural norms and traditions. An unsettled debate on the relationship between violence in movies and societal violence persists. This exploratory analysis investigates whether there is a relationship between the modeled acts of violence in the top 10 movies from 1961 to 2021, and various measures of societal violence in America. The study found statistically insignificant results for the primary variables of interest, however, some subsets of analyses returned statistically significant results on the control variables for GDP and the year time trend. In general, these analyses seem to show support that some measures of violence in movies/media are rising while real-life acts of violence are also increasing.

Keywords: violence, movies, firearms, mass shootings, culture, sociology, psychology, social learning

Introduction

Culture shapes the way people think and act. Cultural products, like film, are one route of its influence**.** It's fair to say that films impact culture and society generally, but the question of whether movies influence individual behavior is a subject of ongoing debate and research. Films shape cultural attitudes and customs as audiences adopt the attitudes and styles of the characters they watch on screen, but more relevant for this study, is the question of whether violence in our entertainment is perpetuating or engendering more violent acts by individuals in society.

In 2020, there were 43,138 total incidents of gun violence, resulting in 19,378 deaths and 23,760 injuries (The Gun Violence Archive, 2020). Violence and mass shootings have been permeating throughout American society as of late; Knowles (2022) notes that violent crime in America is rising. According to the data accessed from Small Arms Survey organization, from 2004 through 2020, violent deaths in America increased from approximately 6.5 deaths per 100,000 to approximately 9 per 100,000.

In June of 2022, during the segment *New Rule: Hollywood's Culture of Violence*, Bill Maher, jokingly jabs at the trend of "uber corporate responsibility" which sees large companies making herculean efforts to comply with the politically correct sides of every issue; however, Maher notes,

> Hollywood has to tell us, why doesn't that include gun violence?... the average American kid sees 200,000 acts of violence on screen before the age of 18 … and according to the FBI, one of the warning signs of a potential school shooter is a fascination with violence filled entertainment.
> ("Real Time with Bill Maher," 2022)

He goes on to point out the glorification of guns and violence that is depicted in blockbuster movies, calling them all 'revenge' movies because in essence that is to what the plots reduce. This underscores the modeling of violence as a socially acceptable tool for conflict resolution and problem solving. Furthermore, violence is often sanitized, the negative consequences of the violence portrayed is omitted.

Many studies explore the relationship between media violence and real-world violence, but the findings remain mixed. Some scholars argue that exposure to violent media can desensitize individuals to violence, increase their likelihood to engage in aggressive behavior, or lead to other negative effects such as fear, anxiety, and desensitization to real-world violence. Other scholars argue that media alone cannot be blamed for violent behavior, as many other factors contribute to violent behavior, including individual and societal factors such as poverty, social isolation, and mental health issues. They suggest that the relationship between media exposure and individual behavior is complex, and cannot be understood without considering individual differences, context, and other situational factors. As such, the debate continues whether there is an influence of violent media on violent behavior.

Films are the media/cultural products chosen for this study, and through the forthcoming analyses, the paper will attempt to contribute to the ongoing discussion on the impact of media on violent behavior and provide insights into the potential consequences of consuming violent films.

Current Study. The present study seeks to examine the relations among modeled violence and gun use trends in films, and incidents of violence in society, with a focus on those related to guns and mass shootings. The intent is to examine the relationship between modeled acts of violence in the top ten movies from 1960 to 2021 and (gun) violence in America during the same period. By analyzing the content of these films and comparing it to real-world incidents, this study seeks to shed light on, and clarify the potential relationships and trends between modeled violence in media and societal violence.

Hypothesis. Formally, the Null Hypothesis for this study[1], is that there is no relationship between modeled acts of violence in film and real-world violence in the United States.

> H_0 = There is no significant difference or relationship between types of modeled acts of violence in films and American societal violence.

The Alternative Hypothesis for this study, is that there is a relationship between modeled acts of violence in film and real-world violence in the United States.

> H_a = There is a significant difference or relationship between types of modeled acts of violence in films and American societal violence.

Analyses and Data. The goal for this paper is to aid in clarifying whether the prevalence of film violence is a predictive factor or has an association with changes in rates of societal violence. The analyses for this paper comprise three studies to allow for the best possibility of detecting the potential links between modeled violence in films and violent behavior. The studies group the datasets by theme.

One source that comprehensively tracked all incidents of violence in the United States for the same time period of the movie data (which ranges from 1961-2021) was not readily available. Therefore, multiple sources were utilized to try to construct a multifaceted perspective. Differing date ranges and foci[2] in the datasets allows for an overlapping examination of the relationship between violent acts in films and violence in society. This also allows a broad view over time.

---

[1] Each analysis in this study is run on 4 different main predictor variables, Single Act with Gun, Single Act without Gun, Multiple Acts with Gun, Multiple Acts without Gun.

[2] Dependent variables, e.g., Societal violence, gun violence, and mass shootings in American society.

The first study, has two subsets of analyses, one for each dataset used. The first of these is derived from the Small arms Survey (SAS) organization, and the data tracks violent deaths per 100,000 in the United States, from 2004 through 2020. The second of these is derived from the Gun Violence Archive's (GVA) Database. The data tracks shooting incidents in the United States, from 2014 through 2021. Both capture a short and recent span of time and hold a quick broad overview.

The second study, has three subsets of analyses, one for each dataset used. The first of these is derived from the Centers for Disease Control and Prevention (CDC) Compressed Mortality File Archives, and the data tracks mortality by assault, from 1968 through 2016. The second of these is derived from the National Archive of Criminal Justice Data (NACJD), and comes from the Firearm Injury Surveillance (FIS) Study. The data tracks firearm injury incidents in the United States, from 1993- 2018. Finally, the third of these is derived from, NACJD, and comes from the Uniform Crime Reports (UCR): Supplementary Homicide Reports for the United States, from 1976 through 2007. Together, these datasets allow for broad examining of the relationship between modeled violence in film and general violence in American society.

The third study, has two subsets of analyses. The first of these is derived from NACJD, and comes from A Comprehensive Assessment of Deadly Mass Shootings (DMS) study. The data tracks deadly mass shootings in the United States, from 1980 through 2018. The second of these is derived from the Violence Project's (VP) Mass Shooter Database. This data tracks mass shootings in the United States, from 1966 through 2021. Together, these datasets allow for examining the relationship between modeled violence in film and mass shootings in American society.

Below is the literature review of existing research on the role of cultural products and culture in shaping attitudes towards violence, and how these attitudes may contribute to real-world violence. To provide a comprehensive framework for the analysis, this paper includes an extensive review of culture, violence, and cultural products.

Literature Review

What follows is an attempt to situate the potential relationship between modeled instances of violence in cultural products – film – as it relates to (gun) violence in American society. The proceeding literature review is on culture, violence, cultural products, and their relationships. First, I will broadly review culture, how its defined and conceptualized. I will do this by reviewing literature on culture, the emergence and building of culture, and the cultural mind. These articles will be reviewed with consideration toward violence.

Second, I will broadly review violence, how its defined and conceptualized. I will do this by reviewing literature on theoretical perspectives, the psychological perspectives, the origins and causes of violence, violence and social organization and violence in society, violence and masculinity, and finally, guns and mass shootings. These articles will be reviewed with

consideration toward a multi-dimensional understanding of violence, exploring its cultural, psychological, and social dynamics.

Lastly, I will broadly review cultural products, how its defined and conceptualized. I will do this by reviewing literature on cultural products and human behavior, cultural products and movies, and cultural products and violence. Below, different perspectives will be examined to attempt to gain insight into the complex and pervasive nature of (gun) violence in American culture and society.

Culture

There is no single, simple definition or generalization of culture, as it is multifaceted and continuously evolving over time. Culture can be broadly defined as the shared values, beliefs, customs, behaviors, and cultural products that characterize a group or society. It encompasses the knowledge, practices, and traditions that shape the way people think, act, and interact with one another. Culture is transmitted from generation to generation through socialization, and it can vary widely across different groups, regions, and historical periods. Culture is a complex and dynamic entity, it is not biologically determined, but rather shaped by various cultural factors and interdependent social systems.

Culture is a social phenomenon, shaped by human interaction (Wissler, 1929). Marett (1928) argues that culture arises from the interaction between humans *and* the environment, and that it is shaped by human instincts. Benedict (1931) discusses the role of culture in shaping individual behavior and society, noting that culture is an adaptation mechanism and that it provides a way of dealing with the environment and solving social problems. Warden (1936) also notes how culture is not a fixed entity but is constantly evolving and that it arises from human interaction, through a combination of inherited traits and environmental factors. Sapir (1931) argues that language is a crucial component of cultural identity; language and culture are closely intertwined, shaping each other. Kroeber (1924) distinguishes between authentic and derivative cultures, highlighting the importance of cultural innovation and creativity. He argues that genuine cultures arise from shared experiences and interactions. Dixon (1928) also emphasizes the dynamic and adaptive nature of culture. Rouse (1940) notes the complex processes of cultural exchange and transformation that is required for the burgeoning of culture.

Concepts of Culture. Tylor (1924) argued that all human societies have a common origin and that the study of primitive cultures can provide insight into the development of modern society. He points out that cultures evolve over time and that there is a universal progression from simpler to more complex cultures. For Tylor, this complex and integrated system includes beliefs, practices, and cultural products**,** and it is shaped by a variety of factors, including history, environment, and social organization. Boas (1911) emphasized the importance of understanding culture in its own context, and that cultural practices are not static. Like Tylor, he argues that culture is shaped by a variety of factors**,** including environment, history**,** and individual experience, and that it is not biologically determined.

Kroeber (1917) argues culture is a distinct entity that exists independently of the individuals who comprise a society, and brings to bear the concept of the *"superorganic,"* which he defines as a system of social relationships and cultural products that is greater than the sum of its individual parts. This emphasizes the need to take into account, culture as a whole, rather than focusing on just the individual behaviors or actions. Afterall, culture is a product of the interactions between individuals, groups, environmental factors, and *itself*. As such, we are continuously in a state of cultural 'modernization'. A consequence of such modernization, Aldrich (1931) notes, is the loss of traditional cultural practices and values, which he argues were integral to the survival and well-being of societies. Eubank (1932) emphasized the importance of understanding the social and cultural context in which individuals live and within which cultural practices and beliefs emerge. He argued that culture is a fundamental aspect of social life, underscoring the importance of history, environment, and social organization throughout the social context of culture.

Ellwood (1938) states that culture is too complex and multifaceted a concept to be reduced to simple definitions or generalizations. He also emphasizes the importance of understanding the social context in which cultural practices and beliefs emerge. Bidney (1944) identified several cultural fallacies, including the belief that all cultures are homogeneous, the idea that culture determines human behavior, and the assumption that all cultural practices are rational and logical**.** Cultural traits are not fixed, they are mutable. They are not independent, but are rather part of an interdependent system. As with the authors above, he believed that cultures are complex and dynamic entities.

Culture and Humans. Hofstede (1980) identifies five dimensions of culture (i.e., power distance, individualism vs. collectivism, uncertainty avoidance, masculinity vs. femininity, and long-term vs. short-term orientation) and how culture shapes them. Berry (1980) highlights the concept of adaptation and proposes four modes of acculturation (i.e., assimilation, integration, separation, and marginalization), depending on how individuals maintain or relinquish their original culture while adapting to a new culture.

Markus and Kitayama (1991) propose that cultural values shape the self-concept and influence cognition, emotion, and motivation. They argue that individualistic cultures prioritize independence and uniqueness, while collectivistic cultures prioritize interdependence and conformity. They argue that the self is a product of culture, and different cultures have distinct models of the self, which affect cognition, emotion, and motivation. They present evidence for the existence of two distinct types of self-construal: independent self-construal, which emphasizes the uniqueness and independence of the individual, and interdependent self-construal, which emphasizes the collective, the interdependence and interconnectedness of individuals within a group. They proposed that Western cultures emphasize individualism, while non-Western cultures emphasize collectivism. Triandis (1994) argues that individualistic and collectivistic cultures have different value systems and behavioral norms that affect how people interact with others. People's behavior is shaped by their culture's values and beliefs about the self, others, and the environment. He notes cultures prioritize the needs and goals of the

individual and group differently. Individualism emphasizes autonomy, independence, and self-reliance, whereas collectivism emphasizes interdependence, cooperation, and loyalty to the group. Individualism/collectivism are complex and multifaceted constructs that influence a wide range of psychological processes (1995).

Nisbett and Miyamoto (2005) argue that culture shapes perception, cognition, and reasoning styles, with people from Western cultures more likely to use analytical thinking which is characterized by breaking down complex stimuli into discrete parts (focusing on isolated objects and attributes), while people from East Asian cultures are more likely to use holistic thinking (emphasizing context and relationships). Choi, Nisbett, and Norenzayan (1999) argue that Western cultures tend to emphasize dispositional attribution, in which a person's behavior is explained by their internal characteristics, such as personality or ability, while non-Western cultures tend to emphasize situational attribution, in which a person's behavior is explained by the context or social environment. They suggest that culture shapes the way individuals perceive and interpret the causes of events, which has implications for social judgment and behavior. Individualistic cultures tend to place greater emphasis on personal control and agency, whereas collectivistic cultures tend to emphasize the role of situational factors and social norms. And, Gelfand and Harrington's (2014) highlight the importance of understanding cultural differences in communication, decision-making, and relationship-building.

Emergence and Building of Culture. For Geertz (1973), culture is a system of meaning and interpretation that people use to make sense of the world around them. Culture is created and transmitted through symbols, which are deeply meaningful to people in a particular society. Interpretation of these symbols and meanings must be done within their cultural context. Similarly, Vygotsky (1978) argues that culture plays a central role in the development of higher psychological processes, such as language and thought. He emphasizes the importance of social interaction and cultural tools, such as language and symbols, in shaping cognitive development, thinking and learning.

Understanding the context in which behavior occurs can help reveal underlying cultural processes (Strauss & Corbin, 1990). Turner (1969) proposes that rituals are a key mechanism for creating and maintaining culture, as they provide a structured framework for shared experiences and meaning-making. He argues that rituals serve to reinforce social structures and values, while also providing a space for individuals to experience a sense of '*communitas',* or collective solidarity. Bourdieu (1977) argues that social practices are shaped by the social structures and systems of power within a culture, and that individuals' *habitus* – their internalized dispositions and ways of thinking – are deeply ingrained and shaped by their social and cultural contexts. Culture is constantly changing and it's vital to understand how cultural practices and beliefs are transformed and reconfigured over time. Bandura (1977) asserts that people learn through observation and imitation of others, hence the importance of social context and cultural factors in shaping behavior and attitudes. Rogoff (1990) argues that learning occurs through active participation in culturally meaningful activities, with more experienced individuals guiding and supporting the learner.

Culture and Human Behavior. Providing a foundational understanding of how cultural beliefs and practices shape individual and group behavior, Mead (1937) discusses how different societies balance cooperation and competition in order to achieve their goals, and how these practices are influenced by cultural norms and expectations. Redfield (1940) argues cultural patterns emerge from the interactions between individuals and their environments. He emphasizes the importance of studying the customs, traditions, and beliefs of local communities to better understand their behavior and attitudes. Cultural patterns are transmitted from generation to generation and they influence the behavior of individuals (1941). Linton (1936) also emphasizes the importance of cultural context in shaping behavior and provides insight into the social and cultural forces that shape human lives. He asserts that cultural practices and beliefs cannot be evaluated using universal standards. Leyens, Paladino, Rodriguez-Torres, Vaes, Demoulin, Rodriguez-Perez, and Gaunt (2000) found that people tend to attribute negative secondary emotions, such as anger and hostility, to outgroups more readily than to ingroups. They suggest that exposure to negative stereotypes and prejudice (in media) can reinforce and perpetuate these attitudes. Dollard (1943) emphasizes the ways in which cultural practices and beliefs shape behavior and socialization processes, particularly in relation to human impulse. He argues that cultural practices are internalized and become part of an individual's personality, influencing their thoughts, feelings, and actions. Winston (1933) argues that culture shapes the ways in which individuals perceive the world around them and the values and beliefs they hold. Culture provides the framework within which individuals develop and express their personalities, and that, cultural patterns shape the way individuals think, feel, and behave. Allport (1923) critiques the idea of group fallacy, for him the idea that human behavior and culture can be understood solely by studying groups or societies is preposterous. He argues that individuals are complex and unique, and that cultural patterns cannot be fully understood without considering individual differences and variations. Finally, Spengler (1937) argues that cultural patterns evolve and decline over time, reflecting the changing values and attitudes of a particular society, culture shapes human behavior on a larger, historical scale.

Cultural Mind and Violence. Cultures vary in the degree to which they emphasize individual uniqueness versus conformity to group norms (Kim & Markus, 1999). These cultural differences have important implications for social behavior and violence. Cultural norms and values influence whether deviance or uniqueness is celebrated or punished. In individualistic cultures, uniqueness is more highly valued and deviance is less likely to be punished, while in collectivistic cultures, conformity and harmony are emphasized and deviance is more likely to be punished. Kim and Markus suggest that individuals in cultures that emphasize uniqueness may be more likely to engage in violent behavior as a means of asserting their individuality and deviating from group norms, whereas those in cultures that emphasize conformity may be more likely to suppress individuality and conform to social norms, reducing the likelihood of violent behavior. Fiske, Kitayama, Markus, and Nisbett (1998) propose that cultural values and beliefs shape our social interactions and cognitive processes, including how we perceive ourselves and others, what we consider to be normal behavior, and what we see as appropriate ways to respond to social situations. They suggest that cultural factors such as social norms, values, and beliefs can influence the way individuals perceive and respond to violent behavior.

As such, cultural factors must be taken into account in order to understand and effectively address issues related to violence.

Gelfand, Raver, Nishii, Leslie, Lun, Lim, and Yamaguchi (2011) conducted a large-scale study across 33 nations and found that cultures can be classified as "tight" or "loose" based on the strength of their social norms and the degree to which they enforce conformity. Tight cultures are characterized by strong norms and a low tolerance for deviance, while loose cultures are more permissive. They argue that tight cultures may be less prone to violence due to the strict enforcement of social norms. In contrast, loose cultures, which have weaker social norms and are more accepting of deviant behavior, may be more prone to violence due to the relative lack of social control.

Cultural differences in cognition and perception can also play a role in shaping attitudes and behaviors related to violence. Culture shapes our cognition and social behavior, but individuals also actively construct their own cultural experiences (Hong, Morris, Chiu, & Benet-Martinez, 2000). Cultural contexts shape the way individuals perceive and interpret the world around them. Cultural norms, values, and beliefs have a profound impact on our perceptions, attitudes, and behaviors, including those related to violence. It is important to understand how cultural factors interact with individual factors to shape our responses to violent situations.

Culture and Violence. Huesmann and Kirwil (2007) discuss the social cognitive theory of aggression and how it suggests that aggressive behavior can be learned through observation, imitation, and reinforcement. They argue that observing violence can increase the risk of violent behavior in the observer. This is due to the process of observational learning, where individuals learn new behaviors by observing others. Bandura (1973) also supports this theory and discusses the *role of modeling* in the acquisition of aggressive behavior. Felson (1998) explores the connection between crime and everyday life, arguing that violent behavior is often a product of situational factors and routine activities. This emphasizes the role of culture in shaping individuals' behavior, as violence is a routine part of everyday life and culture, and individuals learn to respond to violence in certain ways through socialization. Bushman and Anderson (2002) add to this argument by suggesting that media violence can also have an impact on individuals' behavior. After examining the effects of media violence on society they suggest that exposure to violent media can lead to desensitization to violence and an increase in aggressive behaviors and thoughts.

DeKeseredy and Schwartz (2009) argue sexual violence is a product of cultural and social factors, such as gender inequality and power imbalances. For them, sexual violence is a product of larger societal structures and cultural norms that promote male dominance and aggression. They suggest that in order to prevent sexual violence, it is necessary to address the cultural and structural factors that contribute to it, highlighting the importance of prevention and intervention strategies. Hagan and Foster (2003) examine violence throughout human history in relation to social orders, and argue that patterns of violence are shaped by social structures and cultural beliefs and that understanding these patterns is crucial for addressing and preventing

violent behavior. For them, violence is not random but rather a result of social structures and cultural norms that shape individuals' behavior.

Culture and Gun Violence. Gun ownership has a culture. There are a set of beliefs, attitudes, and behaviors surrounding the ownership, possession, and use of firearms. This culture can vary widely depending on factors such as geography, politics, and social norms, but some aspects of gun culture may include a strong emphasis on the right to bear arms, the use of firearms for self-defense or hunting, and a sense of identity and community among gun owners. At the same time, gun culture may also be associated with negative aspects such as violence, crime, and a lack of regulation or oversight.

In America, gun culture has deep historical roots and is closely tied to American notions of individualism, self-reliance, and the right to bear arms, as enshrined in the Second Amendment of the US Constitution (Kopel, 2013). Winkler (2011) notes that guns played a significant role in the founding and expansion of the United States, and many Americans view them as an important tool for self-defense. Additionally, Cook (1984) notes gun ownership has been linked to the notion of masculinity in American culture, with guns being seen as a symbol of strength and power. This has led to a strong pro-gun lobby and a political environment where gun ownership is seen as a symbol of freedom and independence (Altheide, 2009). Many Americans view gun ownership as a symbol of freedom and personal autonomy, as well as a means of self-defense and protection against crime. Debates over gun control laws are often highly polarized in the United States, with proponents of gun rights arguing that restrictions on firearms infringe upon their constitutional rights, while advocates for gun control argue that such measures are necessary to reduce the risks of gun-related violence.

Scientific research on gun violence has been hampered, but scientific inquiry into gun violence is crucial to understanding and ultimately reducing gun-related deaths and injuries (Kellermann & Rivara, 1992). Hemenway (2004) argues that gun violence is a major public health issue in the United States and that policies aimed at reducing access to firearms could reduce gun-related injuries and deaths. He cites evidence showing that guns in the home increase the risk of homicide, suicide, and unintentional injury, leading him to advocate for policies that can reduce gun availability and promote safe storage practices. Vigdor (2002) examines the relationship between right-to-carry laws and crime rates. He finds that such laws are associated with a decrease in certain types of crime. He suggests that other factors such as local crime rates, law enforcement, and economic conditions may play a greater role in determining crime rates than the presence of concealed carry laws. Duggan (2001) presents evidence that increasing gun ownership is associated with higher rates of violent crime. He argues that policies aimed at actually reducing gun ownership could have a significant impact on reducing crime. Cook and Ludwig (2006) focus on the social costs of gun ownership, arguing that widespread gun ownership imposes significant costs on society in terms of lost lives, medical expenses, and lost productivity. Widespread gun ownership leads to higher rates of suicide, domestic violence, and accidental injury. Similarly, they suggest that policies aimed at reducing gun ownership could result in substantial social benefits. In line with these arguments, Zimring and Hawkins (1997) argue that crime is not the primary problem in the United States, but rather that *lethal*

violence is the more pressing issue. They note that crime rates have been decreasing in the United States and that policies aimed at reducing lethal violence should be focused on those who are most likely to commit violent crimes, rather than on reducing crime rates overall. They also suggest that social and cultural factors may play a greater role in determining violence rates than do policies aimed at gun control. Some researchers are divided on whether policies aimed at reducing gun ownership have a significant impact on reducing gun violence, others caution that the relationship between guns and crime is not always straightforward and that more research is needed to fully understand this relationship.

Violence

Violence has long been a topic of interest in various academic disciplines, and there are various perspectives on violence in society. While some scholars focus on individual-level factors, such as self-control, moral development, and emotions, others emphasize the importance of social and cultural contexts, such as norms, institutions, and inequality. Some theories suggest that violence is a rational strategy for achieving certain goals or resolving conflicts, while others suggest that it is a product of irrationality or impulses. By considering the various theoretical perspectives on violence, more effective strategies for preventing and addressing violent behavior, while also promoting social justice and peace, can be developed.

A broad working definition of violence is any behavior that causes harm, whether physical or psychological, intentional or unintentional (Galtung, 1969). Abbink (2000), Bacciagaluppi (2004), and Sussman (1999) situate the complex interplay between the biological, psychological, and social phenomenon of violence. Violence is not simply biological or psychological phenomenon, but also a cultural one that is shaped by social norms and values. Sutherland, Cressey, and Luckenbill (1939/1992) argue that criminal behavior is a product of social structure and cultural values, and that individuals who are exposed to certain types of social influences are more likely to engage in criminal behavior. Effectively, different societies define, respond to, and engage with violence differently.

Theoretical Perspectives on Violence. Collins (1974) proposes a typology of violence, distinguishing between instrumental violence (used to achieve a specific end), expressive violence (used to communicate a message), and sadistic violence (used for the pleasure it provides the perpetrator). He emphasizes the role of socialization in shaping individuals' tendencies towards violence and suggests that violence can be reduced through changes in social norms and institutions. Gilligan (2000, 2004) examines the psychological factors that drive violent behavior, highlighting the role of shame and guilt in promoting violence. They are two distinct emotional experiences that can lead to different responses to violence. Shame and guilt are important psychological factors that can lead to violent behavior, particularly in cases where individuals feel that their sense of self-worth is threatened**.** As such, shame-based cultures may be more prone to violence because individuals are more concerned with their reputation and status. Guilt-based cultures, on the other hand, may be less violent because individuals are more concerned with their internal sense of right and wrong. Girard (1977)

explores the role of sacred and religious beliefs in promoting and justifying violent acts. He states historically, ritual violence, such as sacrifice, helps to maintain social order by channeling our aggressive impulses in controlled ways. He argues violence is a fundamental aspect of human societies, and is rooted in mimetic desire, or the tendency of humans to imitate the desires and actions of others. This can lead to conflicts and violence as individuals/groups compete for scarce resources or status. Uncontrolled violence, on the other hand, threatens the stability of the social order and can lead to chaos and destruction.

Collins (2008) argues that social interactions and power dynamics within groups are significant in promoting violent behavior. Violence is a product of emotional energy, emotional arousal – the intense feelings and emotions that individuals experience in social situations, which can be either positive (such as excitement or anger) or negative (such as fear or shame). This emotional energy can be triggered by factors such as social norms, power dynamics, and emotional contagion. Violent encounters involve a mutual emotional escalation between the perpetrator and victim, with each attempting to gain the upper hand. This highlights the importance of emotional regulation in preventing violent interactions. He also argues that violence is shaped by both the micro, individual-level factors (such as personality traits and emotions), and the macro, societal-level factors (such as cultural values and economic inequality) (2009). Individuals are embedded in a multilayer sphere of social inputs and cultural influences.

Arendt (1970) distinguishes between power and violence, contending that violence is the result of powerlessness. She argues that power is the ability to act in concert with others to achieve a common goal, whereas violence is the use of force to achieve one's aims in the absence of such agreement. Violence is the most extreme form of powerlessness and that it arises when people feel they have no other means to achieve their goals. Arendt also identifies different types of violence, including instrumental violence (used to achieve a specific end), and expressive violence (used to communicate a message). Bufacchi (2005) argues that violence is a social and structural phenomenon. He distinguishes between two types of violence: subjective violence – direct violence (such as physical harm), and objective violence – structural violence (such as poverty, discrimination, and inequality). Subjective violence is the violence that is observable, while objective violence is the violence that is inherent in the structure of society. She argues that subjective violence is the result of objective violence, and that subjective violence is a manifestation of the contradictions and conflicts that exist within society. Englander (2007b) argues that violent behavior is often the result of a combination of biological, psychological, and social factors. She emphasizes the importance of early intervention and prevention in reducing violent behavior. Wieviorka (2009) argues that existing theories often fail to account for the complexity and diversity of violent behavior. He emphasizes the need to consider the context in which violence occurs, for violence is a social process that is shaped by power relations, cultural norms, and historical events.

Wolfe (1976) provides a cultural critique of pornography and the ways in which it perpetuates violent imagery. He argues that depiction of violence in pornography can desensitize viewers to real-life violence and contribute to a culture of violence

Psychological perspectives on violence. Psychological perspectives on violence have focused on understanding the individual-level factors that contribute to violent behavior, including the role of emotions, cognitive processes, and socialization. Violence is not simply a matter of individual pathology or deviant behavior, but rather a reflection of deeper social and cultural problems (Gilligan, 2000). Gilligan contends that violence is rooted in a sense of shame and humiliation that results from social inequality and marginalization (experiences of humiliation, disrespect, and degradation), and that violent behavior is often an attempt to restore a sense of dignity and respect. Shame is a primary emotion that is at the root of many forms of violence, including domestic violence, gang violence, and even terrorism (2004). He suggests that shame arises from a sense of powerlessness and a lack of control over one's life, and that violent behavior is often an attempt to assert control and restore a sense of agency.

Katz (1988) explores the idea that criminal behavior, including violent acts, is often motivated by a desire for excitement and pleasure that comes from violating societal norms and rules, rather than simply a lack of moral values or self-control. He argues that many criminals experience a sense of thrill and excitement from engaging in illegal activities (a moral and sensual allure of breaking the law and engaging in forbidden behavior), and that this sensation can become addictive and lead to escalating levels of violence. This challenges traditional psychological models of criminal behavior, which often emphasize cognitive factors such as decision-making and impulse control, or economic necessity. For Katz, criminal behavior is rooted in deeply emotional and affective processes, and that understanding the subjective experiences of offenders is essential to developing effective interventions and prevention strategies.

Other scholars have suggested that certain personality traits, such as impulsivity and aggression, may be associated with an increased risk of violent behavior. Others have argued that violent behavior is the result of a combination of individual and environmental factors, and that interventions must address both the internal and external influences that contribute to violent behavior.

Origins and Causes of Violence. Several researchers address the controversial topic of whether violence is innate or learned. Freud (1913/1950) proposes that primitive societies were founded on the murder of the father figure and the establishment of the totemic system. He argues that this act of violence is the foundation of human civilization and that the guilt and anxiety associated with it continue to shape human behavior. Essentially, Violence is part of the human condition. He states the tensions resulting from the conflict between individual desires and the demands of society makes violence an inevitable consequence (1930/1961). Kohlberg (1981) proposes that individuals go through a series of moral stages, each characterized by a different level of moral reasoning. He argues that individuals who have reached the highest stage of moral reasoning are less likely to engage in violent behavior because they are guided by universal ethical principles.

Exploring the evolution of violence in humans and its potential biological roots, Lorenz (1963) and Decety, Michalska, Akitsuki, and Lahey (2009) argue that violence has a long evolutionary history and may have served important adaptive functions in human prehistory. Violence evolved as a way for our ancestors to defend themselves against predators and other threats, to acquire resources, and to establish dominance over others – or, free themselves of domination. Decety et al. suggest that the neural and hormonal mechanisms underlying violence are similar to those involved in other adaptive behaviors such as reproduction and social bonding. These mechanisms are regulated by a complex interplay between genes and environmental factors, including social and cultural influences. The authors also argue that while humans may have a predisposition toward violence, environmental factors play a critical role in shaping violent behavior. This means that socialization, cultural norms, and the *availability of resources* can all influence the development of violent tendencies. They argue that empathy, or the ability to understand and share the feelings of others, has evolved as a way to promote social cohesion and reduce conflict, suggesting that interventions that promote empathy and social connectedness may be effective in reducing violent behavior.

While Fromm (1974) contends that violence is not a natural and inevitable part of human behavior, but rather a result of social and cultural factors, Ember and Ember (1997) argue that violence *is* a universal human phenomenon, *but* that its prevalence and expression varies across different cultures. Both suggest that cultural factors play a significant role in shaping attitudes towards violence. Fromm argues that societies that are characterized by competition, aggression, and a focus on individualism tend to be more violent than those that value cooperation, empathy, and community. He suggests that individuals who are unable to express their aggressive impulses in healthy ways may turn to destructive behaviors such as violence. He proposes that people who feel powerless, frustrated, and alienated may be more likely to engage in violent behavior as a way of asserting control and gaining a sense of power. Scheff and Retzinger (2001) argue that feelings of shame and rage can escalate into destructive conflicts, leading to violence. They suggest that understanding the emotional dynamics of violent situations can be critical in developing effective interventions and prevention strategies.

A lack of connection and community in modern societies contributes to feelings of isolation and aggression. Hirschi (1969) argues that the strength of an individual's bonds to society is shaped by four elements: attachment, commitment, involvement, and belief. This perspective emphasizes the importance of socialization and the role of informal institutions, such as family, peers, and *media* in shaping individuals' values and beliefs about violence. Hirschi and Gottfredson (2000) argue that individuals with low self-control are more likely to engage in impulsive, risky, and violent behavior. This perspective highlights the role of individual-level factors, such as personality traits and moral development, in shaping violent behavior. Merton (1938) argues that when individuals are frustrated, when they experience a strain between their goals and their means to achieve them, they may resort to deviant behavior, including violence. Similarly, Cohen (1955) proposes that individuals who feel powerless and excluded from mainstream society may engage in delinquent behavior as a way of asserting their power and gaining recognition. Fromm (1974) also argues that the way in which individuals express their aggression and hostility is shaped by the norms, values, and beliefs of their society. He

observes that societies that promote a culture of violence and aggression tend to produce individuals who are more likely to engage in violent behavior.

Habermas (1979, 1984) and Bowman (2001) argue that violence arises from the failure of communication and the domination of power relations in society. Habermas contends that the rationalization of society has led to the institutionalization of violence and that a democratic society must strive to create conditions for open and inclusive communication. Lea and Young (1984) argue that violence is a rational response to the conditions of inequality, oppression, and deprivation experienced by marginalized groups. Clastres (1994) contends that violence arises from the imposition of power and the suppression of autonomy and freedom. Societies that are organized around hierarchies and domination are more prone to violence. Cohen and Felson (1979) emphasize the importance of situational factors in the occurrence of violence. They argue that crime and violence occur when motivated offenders, suitable targets, and the absence of capable guardians converge in space and time. This perspective highlights the role of environmental factors, such as the availability of weapons and the presence of potential victims, in facilitating violent behavior.

Social Organization. Elias (1939/1994) traced the development of modern European society and its increasingly complex social structures, arguing that as societies become more integrated and interdependent, they also become more stable and less prone to violence, “The Civilizing Process”. The process of civilization involves a gradual suppression of violent and aggressive behavior, which is necessary for social cooperation and the formation of larger societies. However, he also notes that this process is never complete and that there are always tensions between civilized norms and violent impulses. He emphasizes the interconnectedness of social structures and the ways in which individuals and groups are shaped by these structures. According to Elias, violence is not a simple matter of individual aggression, but rather the result of complex and often subtle social interactions that can span generations. Importantly, modern societies are also characterized by a process of “informalization”, in which traditional hierarchies and formal structures are breaking down, and individuals are increasingly left to rely on their own resources and informal networks for social support (1991). The ongoing process of informalization is leading to a breakdown of traditional social structures and a new form of individualism. He suggests that this process is both a cause and a consequence of the rise of the modern nation-state and the decline of traditional social hierarchies (2000).

Cooney (2003) builds on Elias' work by emphasizing the role of institutions in the organization of violence. Violence is not a random or spontaneous occurrence, but rather a product of institutionalized norms and practices that encourage or condone violent behavior. He argues that violence is not simply a product of individual psychopathology or moral failure, but rather the result of larger social and historical processes that shape the ways in which individuals and groups interact with one another. He also emphasizes the role of power in the organization of violence. According to Cooney, violence is often a means of asserting and maintaining power, both within and between social groups, or over a particular group or population.

Violence in Society. Glasser (1998) highlights how many social norms emphasize aggression and competition. In effect, the socialization of individuals into violent behavior patterns is a key factor as to why violence persists. Jackman (2002) argues that violence is a pervasive feature of social life and that it is often used as a means of social control. One key emphasis is on the importance of social structures and cultural norms in shaping violent behavior. He suggests that violence can be understood as a response to social, economic, and political factors, including inequality, competition, and the breakdown of social institutions.

Robb (1997) argues that gender norms and expectations played a significant role in the use of violence, and that patterns of violence were shaped by social hierarchies and power relations. Stewart and Strathern (2002) argue that traditional approaches to the study of violence are limited by their focus on individual motives and actions, and that a more holistic understanding of violence must take into account broader social and cultural factors. Wolfe (1976) argues that violence is a central theme in modern media, and that the depiction of violence in popular culture contributes to its normalization and acceptance. Wolfe's perspective highlights the importance of understanding the ways in which media and popular culture can reinforce patterns of violent behavior.

Crime and Violence. Crime and violence also have a complex and multifaceted dynamic. Levi and Maguire (2004) argue that the increasing inequality between countries and within countries has led to a rise in crime and violence. The authors suggest that the current economic system, with its emphasis on market forces and competition, has created a global underclass that is more likely to engage in criminal behavior. Felson (2009) arguing that while not all crime involves violence, most violent acts are related to some form of criminal activity. Felson argues that understanding the link between crime and violence is essential for developing effective strategies to reduce both. He proposes a situational approach to crime prevention that focuses on identifying and targeting specific situations where crime and violence are likely to occur. This approach involves identifying key risk factors that increase the likelihood of violence, such as the presence of drugs or alcohol, or the availability of weapons, and implementing targeted interventions to reduce those risks. Stanko (2001) notes that violence can take many forms, including physical, sexual, emotional, and economic violence. She argues that violence is a socially constructed phenomenon, shaped by cultural norms and values, as well as by broader social, economic, and political factors. Topalli (2006) explores the concept of "autotelic crime," which refers to criminal behavior that is engaged in for its own sake, rather than for external rewards such as money or status. Drawing on neutralization theory to argue that autotelic crime is facilitated by the ability of offenders to neutralize or justify their actions, through techniques such as denial of responsibility, denial of injury, and appeal to higher loyalties, she suggests that interventions that disrupt these neutralization techniques may be more effective at reducing autotelic crime than traditional criminal justice interventions. She also argues that social networks provide a supportive environment for criminal activities and that criminal behavior is often a group phenomenon.

Violence and Masculinity. Kimmel (1994) argues that masculinity is constructed through a fear of being perceived as feminine or gay, which leads to violence against women and other

marginalized groups. He suggests that breaking down these gender norms is essential to reducing violence. He also argues that guns are an important symbol of male power and domination in American culture. He suggests that the prevalence of gun violence is not just a result of access to firearms, but is also linked to cultural constructions of masculinity that emphasize aggression, dominance, and control (2000). Connell (1987) explores the ways in which power is linked to gender and masculinity, arguing that men often use violence as a way to maintain dominance and control over women and other men. Messerschmidt (1993) argues that gender and masculinity shape criminal behavior. Conis (2003) finds that men who own guns tend to hold traditional beliefs about masculinity, including a belief in the importance of physical strength and a tendency to view violence as an acceptable means of resolving conflict. Carlson and Carlson (2019) argue that gun violence is a product of toxic masculinity, which they define as a cultural ideal that encourages men to prioritize power and control over empathy and cooperation. They suggest that the high prevalence of gun violence in the United States is a result of a cultural emphasis on aggression and dominance, and that addressing this issue will require a fundamental shift in societal attitudes towards masculinity and violence. Kellermann, Rivara, and Rushforth (1993) found that the presence of a gun in the home was associated with an increased risk of homicide, particularly for women.

Gun Violence in the Context of Mass Shootings. Duwe (2007) identifies several key themes that recur throughout the history of mass shootings, including the role of guns and the motivations of the shooters. He defines mass murder as "the intentional killing of four or more people at a single location with no cooling-off period between the murders" (p. 3) which is narrower than other definitions of mass killing, which often include events with three or more victims. He notes that mass murder rates increased during the 1920s and 1930s, decreased in the 1940s and 1950s, and then increased again in the 1960s and 1970s. Since the 1980s, the rate of mass murder has remained relatively stable. He identifies three types of mass murderers: family killers, felony killers, and public killers. Family killers are those who kill their family members or loved ones. Felony killers commit mass murder during the commission of another crime, such as robbery. Public killers are those who commit mass murder in a public place, often for reasons related to revenge or attention-seeking. He notes that many mass murderers have experienced some form of personal or professional failure, such as losing a job or a relationship, and that this can trigger their violent behavior, and that firearms are the most common weapon used in mass murders. He also notes that the *availability of firearms* in the United States has been a major factor in the high rate of mass murder in the country. Lankford (2016) examined trends in mass shootings over the past 50 years, and finds that there has been a significant increase in the frequency of such events in recent decades. The author also identifies several commonalities among mass shooters, including a sense of social isolation and a desire for attention. Towers, Gomez-Lievano, Khan, Mubayi, and Castillo-Chavez (2015) analyzed data on mass shootings and found evidence of a contagion effect, particularly in the immediate aftermath of a high-profile shooting. Their work highlights the potential for copycat behavior.

Cultural Products

Cultural products are any objects, artifacts, or expressions that are created by humans and convey meaning or information about a particular culture (Kroeber & Kluckhohn, 1952). They can include things like art, literature, music, films, fashion, food, myths, and language, among others. Cultural products are shaped by and help to shape the values, beliefs, and customs of a society or group, and are often used to express identity, transmit knowledge, and communicate social and political ideas.

Cultural Products and Human Behavior. Fiske (1993) focuses on the cognitive processes involved in understanding and interpreting social information. She argues that social cognition involves a range of mental processes, including attention, categorization, memory, and inference, and that these processes are shaped by social factors, such as culture, stereotypes, and social norms. She notes that people use mental shortcuts, or heuristics, to make judgments about others and their behavior. Zajonc (1980) presents the idea of affective preference, where preferences for cultural products and other stimuli can be formed based on emotional reactions, without necessarily involving cognitive processing or conscious evaluation. He suggests that affective preference can be influenced by a range of factors, including familiarity, mere exposure, and classical conditioning, and that it can have a powerful impact on behavior and decision-making.

Eagly and Chaiken (1993) discuss psychology of attitudes, pointing out how attitudes are formed, changed, and expressed. They argue that attitudes are influenced by a range of cognitive and affective factors, including beliefs, emotions, social norms, and personal experience, and that these factors interact in complex ways to shape our attitudes towards cultural products and other social phenomena. Petty and Cacioppo (1986) suggest that attitude change can occur through both central and peripheral routes of communication and persuasion, arguing that persuasion can occur through both a careful evaluation of the message (central route) and through more superficial cues, such as the attractiveness of the source or the emotional content of the message (peripheral route). They discuss how these routes interact with motivation and ability to process information, and how they can impact attitudes towards cultural products and other phenomena. This has implications for image-based messaging. Shrum, Wyer, and O'Guinn (1998) discuss the psychology of entertainment media, exploring how entertainment products can blur the lines between entertainment and persuasion, between entertainment and advertising or propaganda. They argue that entertainment media can be used to convey persuasive messages, often through subtle cues or implicit associations, and that the effectiveness of these messages depends on the audience's attention, motivation, and ability to process information. Berger and Heath (2007) explore how consumers use products as a way to signal their identity and how this can lead to divergence from others. Consumers use products to signal aspects of their identity to others, such as social status or personality traits. They argue that the products consumers choose can be seen as a way of communicating their values, beliefs, and personality to others, and that these choices are influenced by social factors, such as social norms, reference groups, and self-concept.

Cultural Products: Movies. Fiske (1992) argues fans of popular media (including movies) create their own cultural economy, separate from mainstream culture. Fiske states that fandom is an important source of cultural production and resistance to dominant cultural norms. Fans create their own communities, develop their own language, and produce their own media, all of which contribute to a distinct cultural economy. This highlights how movies can be a part of a larger cultural phenomenon. MacCabe (2001) states that movies have the power to shape and reflect culture, arguing movies can be seen as a form of cultural memory, and that they often reveal deeper cultural anxieties and desires. As they shape cultural attitudes and values, they can be a powerful force in shaping public opinion and the cultural context in which they are produced and consumed. Bennett (1998) argues that cultural value is a contested and fluid concept, and that cultural institutions must constantly negotiate their relationship to broader cultural trends (including movies). Cultural institutions can shape the ways in which cultural value is perceived and evaluated, and this can impact the production and consumption of cultural products. Hollywood movies have become a dominant force in global culture, and this has implications for local cultural production (Miller, 2001). Miller argues that Hollywood movies often reflect and reinforce dominant cultural norms, and that they can have a negative impact on local cultural traditions. He shows how Hollywood movies can be seen as a form of cultural imperialism, and how they can impact the cultural values and identities of local populations. Staiger (1992) argues that movies can be seen as a form of moral education, and that the act of watching movies involves complex ethical decisions about what to watch and how to interpret what is seen. She shows how movies can impact our moral values and attitudes, and how they can be a powerful force in shaping public opinion. As such, movies impact the ethical and moral values of individuals and society as a whole.

Cultural Products and Violence. Brown (2020) conducted a meta-analysis on the relationship between media consumption and attitudes towards gun violence. The study found that exposure to media violence was associated with more permissive attitudes towards gun violence. The author suggested that media literacy education may help combat the normalization of gun violence in the media. Savage and Yancey (2008) found that exposure to violent media increased the likelihood of criminal aggression. They suggest that reducing exposure to media violence could reduce the likelihood of engaging in criminal aggression. Huesmann, Moise-Titus, Podolski, and Eron (2003) found that exposure to TV violence during childhood was a significant predictor of adult aggressive behavior, even after controlling for other risk factors. They note that this significant correlation suggests that exposure to violent media in childhood contributes to violent behavior in adulthood.

Johnson (2016) investigated the effects of songs with violent lyrics in hip-hop and rap genres, finding a positive relationship between exposure to violent lyrics and aggressive behavior. He suggests that this relationship is particularly strong among individuals with a history of aggression*.* Mullin and Linz (1995) found that exposure to sexually violent films led to desensitization to violence against women and reduced sympathy for victims of domestic violence. They suggest that exposure to such media can lead to distorted perceptions of violence against women and reduced empathy for victims. Malamuth and Check (1985) conducted a field experiment and found that exposure to mass media depicting violence

against women led to greater acceptance of violence against women. Essentially, exposure to sexually violent media increased men's acceptance of rape myths and hostile attitudes towards women. The study suggests that media literacy programs could be an effective way to combat sexual violence. McGloin and Wilson (2019) found that media coverage of mass shootings was associated with a small but significant increase in the number of mass shootings over time. media coverage of mass shootings can have a significant impact on the public's attitudes towards gun control, mental health, and law enforcement. The authors suggested that media organizations should consider more responsible coverage of mass shootings to avoid inspiring copycat crimes. Schildkraut and Muschert (2014) suggest that the way mass shootings are framed in the media may contribute to public perception of the causes of such events.

Anderson and Dill (2000) found that playing violent video games increased aggression (aggressive thoughts, feelings, and behavior) in the laboratory and in real life. They argue that the effects of violent video games are similar to those of other forms of media violence. Bushman and Anderson (2002) tested the General Aggression Model by examining the effects of playing violent video games on hostile expectations. The study found that playing violent video games increased hostile expectations, which in turn increased aggression. This raised likelihood of developing hostile expectations and aggressive behavior, can lead to long-term changes in cognitive processes that influence behavior. Gentile, Lynch, Linder, and Walsh (2004) found that habitual exposure to violent video games was associated with higher levels of aggression and lower academic performance. They suggest that these effects are due to the reinforcement of violent behavior and desensitization to violence that occurs with repeated exposure. Ivory and Kalyanaraman (2007) found that violent video games can increase physiological arousal and aggression in players. They argue that the effects of violent content in video games on aggression are moderated by players' level of involvement and presence. The study suggests that players who are more immersed in the game are more likely to experience physiological arousal and aggression when exposed to violent content. They argue that game developers should take these factors into account when creating games with violent content.

However, Ferguson (2017) found no evidence of a causal link between video game violence and real-world aggression. He cites numerous studies that show no relationship between video game exposure and aggression, and suggests that the correlation between the two is often overemphasized in the media. In fact, the study also suggests that video games can have positive effects on prosocial behavior and academic performance. Bond (2019) found no evidence supporting the claim that playing violent video games is associated with increased mass shootings. Though there is some evidence that violent video games can increase aggression in players, there is no clear causal link between video games and mass shootings. He argues that blaming video games for mass shootings is a way to avoid addressing more complex societal issues. Ferguson and Rueda (2019) conducted a study on the effects of violent video game exposure on aggressive behavior, hostile feelings, and depression. The study found no evidence of a significant effect of violent video games on any of these factors. They argued that violent video games are not a major risk factor for violent behavior.

Markey and Markey (2010) found that people who are high in trait aggression, low in empathy, high in sensation-seeking, and low in agreeableness may be more vulnerable to the effects of violent video games. They suggest that understanding individual differences in susceptibility to media effects is important in developing interventions to mitigate the negative effects of violent media.

Overall, despite some contrarian findings and arguments, these studies suggest that exposure to violent cultural products, such as screen violence and video game violence, could potentially increase aggressive thoughts, feelings, and behavior, and lead to desensitization to violence and more permissive attitudes towards gun violence. However, the effects of violent media on individual behavior may depend on individual differences in susceptibility to media effects. Meaning, there are probably some people who are more prone to maladaptive, social and cultural behaviors that, for individual and circumstantial reasons, leaves them more prone to certain cultural and social influences that may increase the likelihood of engaging in violent acts or a mass shooting event.

Methodology

Many debate the influence of violent film on societal violence. Looking at whether there is a relationship between the two can help show if violence in film is connected to violence in society. If they are connected, it supports the idea that violent media influences societal violence. But if there is no connection, it suggests that other factors have a bigger impact on violence in society. While media may play a role, it is likely a small one compared to other factors. We cannot measure media exposure at a large scale, so we have to rely on estimates based on how much media people consume. These estimates generally show what audiences prefer at specific moments in time.

Measures and Coding Procedures

Film Data. To study the patterns of violence in movies the present research used the ten highest grossing movies from every year from 1961 through 2021. Data was collected by scraping *www.the-numbers.com*[3] and accessing the Open Movie Database (OMDb) API[4], this was done using the *rvest* and *omdbapi* packages in RStudio 4.2 (2022). The top ten movies were selected because it was likely the best indication of the *general public's exposure* to movie titles within a given year, and the volume of movie violence coding was manageable[5]. If a movie was not accessible, rankings were shifted to include the next most financially successful movie (*The Cannonball Run,* 6th place in 1981 was inaccessible*, Tarzan, The Ape Man,* 11th place in 1981 was included in the top ten instead). A total of 610 movies were coded for this analysis. A full list of movies is provided in Appendix 4. Each movie was rated for violent content based on explicit

[3] https://www.the-numbers.com/market/xxxx/summary; where xxxx is the year (1960-2021).
[4] https://www.omdbapi.com; API Key required.
[5] Initially 50 movies per year were envisioned, that was reduced to 25, then to 20. Finally, 10 movies per year was selected for its manageability.

and distinct instances of modeled aggression/violent acts. Violence is defined, for the purpose of movie rating, as *any intentional act that causes harm, injury, or death*. This includes war scenes, torture, strangulation, assault, and other acts such as hitting, kicking, shoving, shooting, stabbing, and so on. Essentially, any instance of modeled aggression/violent act towards an 'other' – whether graphic, comedic, animated, gory, or otherwise – was counted. The present research did not include rape or sexual assault within the criteria. Specifically, one count and two-or-more counts of violence, and whether at least one of those counts used a firearm (or firearm type weapon) were recorded. Not considered were bow and arrows, cross bows, freeze rays, bubble guns, etc. as firearms, nor were instances counted that were during tournaments or competitions where violence was to be expected. The attempt was to keep the criteria as psychologically relevant as possible to everyday people and life. For each set of analyses in the following studies, when the film data is merged with the seven societal violence datasets mentioned above, the years were truncated to the respective years in the violence datasets.

Film Variables. As mentioned above, each movie was rated for violent content based on instances of modeled violence. These variables were binary coded. Specifically, the variable *Single Act* captures if the movie had at least one incident of modeled violence, or not. *Single Act w/G* captures if the movie had at least one incident of modeled violence that included firearm use, or not. The variable *Multiple Acts* captures if the movie had two or more incidents of modeled violence, or not. Finally, the variable *Multiple Acts w/G* captures if the movie had two or more incidents of modeled violence and at least one incident included firearm use, or not. The present research is most interested in the *Multiple Acts w/G variable.*

Control Variables. As argued by Sampson and Grove (1989) and Singer and Small (1972) various control variables such as geographic, economic, political, social factors, measures of poverty, racial/ethnic composition, residential instability, and family disruption, among others, should be used in regression analyses if available.

Across all studies, where relevant, three main control variables, aside from *Year*, were incrementally included in the regression models in each set of analyses. Two datasets for mass shootings allowed the inclusion of a fourth control variable.
The three main controls[6] are,

- US *GDP in Billions*
- Whether the Federal Assault Weapons Ban (*FA Weapons Ban*) was active, or not
- Whether there was a *Major US Military Involvement, or not*

The fourth control[7] is available for the mass shooting datasets, and indicates,

- Whether the shooter had any sign of *health/mental health issues,* including official diagnoses, or not

[6] Gathered from Macrotrends (2023) and Wikipedia (2023a, 2023b).
[7] Health/Mental Health measure was included in original datasets.

First, descriptive statistics were gathered, then simple correlations were computed between the ratings of violence in films (Single act, Multiple Acts, etc.) and the metrics of societal violence (e.g., incidents of Assault, incidents of mass shootings, etc.). This allows us to broadly observe the covariation between modeled violence in films and violence in society. Third, Tests for autocorrelation in the errors (AR) and unit roots (UR) were implemented on preliminary regression models. According to Sadler, Ethier, Gunn, Duong, and Woody (2009) and Warner (1998), raw data often contain trends and autocorrelation, which means that observations from one time period are correlated with observations from past time periods. This can be problematic because autocorrelations within a time series can lead to false correlations between two time series (Warner, 1998). Preliminary analyses showed that the majority of datasets had some amount of AR process or presence of UR. As such, and in consideration of consistency, comparability, and ease of interpretation, all final regressions were run with the First-Differenced variables. First-Differencing addresses concerns of auto correlation and violation of staionarity. All tables and results are available in the supplementary materials.

Studies

Study 1. Studies 1a and 1b examine the relationships between measures of modeled acts of violence in the top ten films and societal violence for the last two decades (2004-2021). The first study asks what is the relationship of the modeled acts with violent deaths, and the second asks what is the relationship with assaults incidents with gun violence, with fatalities during those incidents, and with injuries during those incidents.

Study 1a. The first study uses the Small Arm Survey Database (2022). *Violent Deaths per 100k* is the outcome variable that captures the yearly count of violent deaths per 100,000.

Descriptive Statistics. For the Time Trend Control Variable: Study 1a uses *Year* observations (n = 17, min = 2004, max = 2020). For First-Differencing in regressions, *Year* observations change (n = 16, min = 2005, max = 2020).
For the Dependent Variable: study 1a uses *Violent Deaths per 100k* ($\bar{x}$ = 6.5, s = 0.89, min = 5.32, max = 8.9).
For the Independent Variables: Study 1a uses *Single Act* ($\bar{x}$ = 0.42, s = 0.14, min = 0.2, max = 0.6), *Multiple Acts Act* ($\bar{x}$ = 0.4, s = 0.15, min = 0.2, max = 0.6), *Single Act w/G* ($\bar{x}$ = 0.55, s = 0.16, min = 0.3, max = 0.8), and *Multiple Acts w/G* ($\bar{x}$ = 0.55, s = 0.16, min = 0.3, max = 0.8). The ratio for the predictor variables represents the average number of the top ten movies that displayed the modeled act(s), thus, for instance, the x-bar for *Single Act,* 0.42, means that on average, 4.2 of the top ten movies display a single modeled act of violence, and so on.
For the Control Variables: study 1a uses *GDP in Billions* ($\bar{x}$ = 16673.16, s = 2849.13, min = 12217.19, max = 21380.98), *FA Weapons Ban* ($\bar{x}$ = 0.06, s = 0.24, min = 0, max = 1), and *Major US Military Involvement* ($\bar{x}$ = 1, s = 0, min = 1, max = 1).

Correlations. The four independent variables were correlated with the dependent variable, *Violent Deaths per 100k, Single Act (r = -0.37), Multiple Acts (r = -0.32), Single Act w/G (r = 0.36), and Multiple Acts w/G (r = 0.36). Single Act* and *Multiple Acts* are moderately negatively

correlated with *Violent Deaths per 100k, and Single Act w/G* and *Multiple Acts w/G* are moderately positively correlated with *Violent Deaths per 100k,* for the years 2004 through 2020.

Tests: Autocorrelation and Unit Roots. The Durbin-Watson (D-W) statistic was calculated to test for autocorrelation in the data. The D-W statistic value is 1.09, and the lag-autocorrelation at 2 is 0.25 ($p = 0.048$). The null hypothesis of no serial correlation was rejected at the $p < 0.05$ level.
The Breusch-Godfrey (B-G) test for serial correlation was also conducted to assess the presence of autocorrelation in the data. The test statistic is calculated as 9.8 with 1 lag, and the associated p-value is 0.002. The null hypothesis of no serial correlation was rejected at the $p < 0.05$ level.

The Augmented Dickey-Fuller (ADF) test was performed to test for the presence of unit root in the data. The test statistic is calculated as 0.82 with 3 lags, and the associated p-value is 0.87. The null hypothesis of a unit root was not rejected at the $p < 0.05$ level.

Study 1b. The second set of analysis for the first study uses the Gun Violence Archive Database (2023) for years 2014 through 2021. *Incidents* captures the yearly shooting incidents; assaults with gun violence. *Fatalities* captures the yearly count of deaths during shooting incidents. *Injuries* captures the yearly count of gunshot injuries during shooting incidents.

Descriptive Statistics. For the Time Trend Control Variable: Study 1b uses *Year* observations ($n = 8$, min = 2014, max = 2021). For First-Differencing in regressions, *Year* observations change ($n = 7$, min = 2015, max = 2021).
For the Dependent Variables: study 1b runs tests for 3 different outcome variables. Gun Violence *Incidents* ($\bar{x} = 37377$, $s = 5050.29$, min = 32369, max = 45273), *Fatalities* during incidents ($\bar{x} = 14882.25$, $s = 2645.67$, min = 11829, max = 19357), and *Injuries* during incidents ($\bar{x} = 30094.38$, $s = 5875.95$, min = 21398, max = 38499).
For the Independent Variables: Study 1b uses *Single Act* ($\bar{x} = 0.31$, $s = 0.15$, min = 0.1, max = 0.5), *Multiple Acts Act* ($\bar{x} = 0.26$, $s = 0.15$, min = 0, max = 0.5), *Single Act w/G* ($\bar{x} = 0.68$, $s = 0.16$, min = 0.5, max = 0.9), and *Multiple Acts w/G* ($\bar{x} = 0.68$, $s = 0.16$, min = 0.5, max = 0.9).
For the Control Variables: study 1b uses *GDP in Billions* ($\bar{x} = 20027.34$, $s = 1908.37$, min = 17550.68, max = 23315.08), and *Major US Military Involvement* ($\bar{x} = 1$, $s = 0$, min = 1, max = 1).

Correlations. The four independent variables were correlated with the three different dependent variables. *Incidents: Single Act (r = -0.58), Multiple Acts (r = -0.59), Single Act w/G (r = 0.59), and Multiple Acts w/G (r = 0.59). Single Act* and *Multiple Acts* are moderately to strongly negatively correlated with *Incidents, and Single Act w/G* and *Multiple Acts w/G* are moderately to strongly positively correlated with *Incidents,* for the years 2014 through 2021.

Fatalities: Single Act (r = -0.63), Multiple Acts (r = -0.58), Single Act w/G (r = 0.65), and Multiple Acts w/G (r = 0.65). Single Act and *Multiple Acts* are strongly negatively correlated with

Fatalities, and Single Act w/G and *Multiple Acts w/G* are strongly positively correlated with *Fatalities,* for the years 2014 through 2021.

Injuries: Single Act (r = -0.53), Multiple Acts (r = -0.51), Single Act w/G (r = 0.56), and Multiple Acts w/G (r = 0.56). Single Act and *Multiple Acts* are moderately negatively correlated with *Fatalities, and Single Act w/G* and *Multiple Acts w/G* are moderately positively correlated with *Fatalities,* for the years 2014 through 2021.

Tests: Autocorrelation and Unit Roots. The Durbin-Watson (D-W) statistic was calculated to test for autocorrelation in the data. The D-W statistic value is 2.99, and the lag-autocorrelation at 2 is -0.61 ($p = 0.036$). The null hypothesis of no serial correlation was rejected at the $p < 0.05$ level.
The Breusch-Godfrey test for serial correlation was also conducted to assess the presence of autocorrelation in the data. The test statistic is calculated as 0.81, with 1 lag, and the associated p-value is 0.37. The null hypothesis of no serial correlation was rejected at the at the $p < 0.05$ level.

The Augmented Dickey-Fuller (ADF) test was performed to test for the presence of unit root in the data. The test statistic is calculated as 1.37, with 2 lags, and the associated p-value is 0.95. The null hypothesis of a unit root was not rejected at the $p < 0.05$ level.

Study 2. Studies 2a, 2b, and 2c examine the relationships between measures of modeled acts of violence in the top ten films and societal violence (1968-2020). The first study asks what is the relationship of the modeled acts with homicide and assault deaths, the second asks, what is the relationship with assaults incidents, with incidents of assault injuries, and incidents of assault gun injuries. The last study asks what is the relationship of the modeled acts with homicide incidents and with homicide gun incidents.

Study 2a. The first set of analysis for the second study uses the Center for Disease Control and Prevention's Compressed Mortality File for years 1968 through 2016 (2023). *Deaths per Year* captures the yearly counts of homicide and assault deaths.

Descriptive Statistics. For the Time Trend Control Variable: Study 2a uses *Year* observations (n = 49, min = 1968, max = 2016). For First-Differencing in regressions, *Year* observations change (n = 48, min = 1969, max = 2016).
For the Dependent Variable: study 2a uses Homicide and Assault *Deaths per Year* ($\bar{x} = 19451.1$, $s = 3056.95$, min = 14336, max = 26254).
For the Independent Variables: Study 2a uses *Single Act* ($\bar{x} = 0.38$, $s = 0.14$, min = 0.1, max = 0.6), *Multiple Acts Act* ($\bar{x} = 0.32$, $s = 0.15$, min = 0.1, max = 0.6), *Single Act w/G* ($\bar{x} = 0.5$, $s = 0.14$, min = 0.2, max = 0.8), and *Multiple Acts w/G* ($\bar{x} = 0.49$, $s = 0.14$, min = 0.2, max = 0.8). The ratio for the predictor variables represents the average number of the top ten movies that dis played the modeled act(s).

For the Control Variables: study 2a uses *GDP in Billions* ($\bar{x}$ = 7771.08, s = 5527, min = 942.5, max = 18695.11), *FA Weapons Ban* ($\bar{x}$ = 0.22, s = 0.42, min = 0, max = 1), and *Major US Military Involvement* ($\bar{x}$ = 0.57, s = 0.5, min = 0, max = 1).

Correlations. The four independent variables were correlated with the dependent variable, *Deaths per Year, Single Act (r = -0.07), Multiple Acts (r = -0.22), Single Act w/G (r = 0.09), and Multiple Acts w/G (r = 0.11). Single Act* and *Multiple Acts* are weakly negatively correlated with *Deaths per Year, and Single Act w/G* and *Multiple Acts w/G* are weakly positively correlated with *Deaths per Year,* for the years 1968 through 2016*.*

Tests: Autocorrelation and Unit Roots. The Durbin-Watson (D-W) statistic was calculated to test for autocorrelation in the data. The D-W statistic value is 1.18, and the lag-autocorrelation at 4 is 0.27 (p = 0.01). The null hypothesis of no serial correlation was rejected at the $p < 0.05$ level.
The Breusch-Godfrey test for serial correlation was conducted to assess the presence of autocorrelation in the data. The test statistic is calculated as 33.55, with 1 lag, and the associated p-value is less than 0.001. The null hypothesis of no serial correlation was rejected at the $p < 0.05$ level.

The Augmented Dickey-Fuller (ADF) test was performed to test for the presence of unit root in the data. The test statistic was calculated as -0.05, with 1 lag, and the associated p-value was 0.59. The null hypothesis of a unit root was not rejected at the $p < 0.05$ level.

Study 2b. The second set of analysis for the second study uses the Firearm Injury Surveillance Study (2022) for years 1993 through 2020. *Assault Injuries* captures the yearly counts of assaults that caused injuries. *Gun Injuries* captures the yearly counts of assaults with injuries caused by firearms.

Descriptive Statistics. For the Time Trend Control Variable: Study 2b uses *Year* observations (n = 28, min = 1993, max = 2020). For First-Differencing in regressions, *Year* observations change (n = 27, min = 1994, max = 2020).
For the Dependent Variables: study 2b runs tests for 2 different outcome variables. *Assault Injuries* ($\bar{x}$ = 2784.46, s = 878.77, min = 1699, max = 5534), and *Gun Injuries* assaults ($\bar{x}$ = 2113.82, s = 776.15, min = 1290, max = 4760).
For the Independent Variables: Study 2b uses *Single Act* ($\bar{x}$ = 0.41, s = 0.12, min = 0.2, max = 0.6), *Multiple Acts Act* ($\bar{x}$ = 0.36, s = 0.14, min = 0.1, max = 0.6), *Single Act w/G* ($\bar{x}$ = 0.54, s = 0.14, min = 0.3, max = 0.8), and *Multiple Acts w/G* ($\bar{x}$ = 0.54, s = 0.14, min = 0.3, max = 0.8).
For the Control Variables: study 2b uses *GDP in Billions* ($\bar{x}$ = 13706.87, s = 4451.79, min = 6858.56, max = 21380.98), *FA Weapons Ban* ($\bar{x}$ = 0.39, s = 0.5, min = 0, max = 1), and *Major US Military Involvement* ($\bar{x}$ = 0.79, s = 0.42, min = 0, max = 1).

Correlations. The four independent variables were correlated with the two dependent variables. *Assault Injuries: Single Act (r = -0.19), Multiple Acts (r = -0.08), Single Act w/G (r = 0.37), and Multiple Acts w/G (r = 0.41). Single Act* and *Multiple Acts* are weakly negatively

correlated with *Assault Injuries, and Single Act w/G* and *Multiple Acts w/G* are moderately positively correlated with *Assault Injuries,* for the years 1993 through 2020*.*

Gun Injuries: Single Act (r = -0.25), Multiple Acts (r = -0.16), Single Act w/G (r = 0.39), and Multiple Acts w/G (r = 0.43). Single Act and *Multiple Acts* are weakly negatively correlated with *Gun Injuries, and Single Act w/G* and *Multiple Acts w/G* are moderately positively correlated with *Gun Injuries,* for the years 1993 through 2020*.*

Tests: Autocorrelation and Unit Roots. The Durbin-Watson (D-W) statistic was calculated to test for autocorrelation in the data. The D-W statistic value is 1.2, and the lag-autocorrelation at 2 is 0.095 ($p = 0.04$). The null hypothesis of no serial correlation was rejected at the $p < 0.05$ level.
The Breusch-Godfrey test for serial correlation was conducted to assess the presence of autocorrelation in the data. The test statistic is calculated as 9.96, with 1 lag, and the associated p-value is 0.002. The null hypothesis of no serial correlation was rejected at the $p < 0.05$ level.

The Augmented Dickey-Fuller (ADF) test was performed to test for the presence of unit root in the data. The test statistic is calculated as 2.19, with 2 lags, and the associated p-value is 0.99. The null hypothesis of a unit root was not rejected] at the $p < 0.05$ level.

Study 2c. The third and final set of analysis for the second study uses the Uniform Crime Reports: Supplementary Homicide Reports (2009) for years 1976 through 2007. *Incidents* captures the yearly counts of homicides. *Gun Incidents* captures the yearly counts of homicides by firearm.

Descriptive Statistics. For the Time Trend Control Variable: Study 2c uses *Year* observations (n = 32, min = 1976, max = 2007). For First-Differencing in regressions, *Year* observations change (n =31, min = 1977, max = 2007).
For the Dependent Variables: study 2c runs tests for 2 different outcome variables. Homicide *Incidents* ($\bar{x} = 16945.66$, $s = 2917.34$, min = 12260, max = 22174), and Homicide *Gun Incidents* ($\bar{x} = 10852.5$, $s = 2001.56$, min = 7914, max = 15362).
For the Independent Variables: Study 2c uses *Single Act* ($\bar{x} = 0.38$, $s = 0.13$, min = 0.1, max = 0.7), *Multiple Acts Act* ($\bar{x} = 0.32$, $s = 0.14$, min = 0.1, max = 0.6), *Single Act w/G* ($\bar{x} = 0.5$, $s = 0.15$, min = 0.2, max = 0.8), and *Multiple Acts w/G* ($\bar{x} = 0.49$, $s = 0.15$, min = 0.2, max = 0.8).
For the Control Variables: study 2c uses *GDP in Billions* ($\bar{x} = 6975.07$, $s = 3684.07$, min = 1873.41, max = 14474.23), *FA Weapons Ban* ($\bar{x} = 0.34$, $s = 0.48$, min = 0, max = 1), and *Major US Military Involvement* ($\bar{x} = 0.34$, $s = 0.48$, min = 1, max = 1).

Correlations. The four independent variables were correlated with the two dependent variables. *Incidents: Single Act (r = -0.05), Multiple Acts (r = -0.23), Single Act w/G (r = -0.02), and Multiple Acts w/G (r = 0.02). Single Act, Multiple Acts, and Single Act w/G* are very weakly negatively correlated with *Incidents,* and *Multiple Acts w/G* is very weakly positively correlated with *Incidents,* for the years 1976 through 2007*.*

Gun Incidents: Single Act (r = -0.01), Multiple Acts (r = -0.18), Single Act w/G (r = 0.02), and Multiple Acts w/G (r = 0.05). Single Act and *Multiple Acts* are very weakly negatively correlated with *Gun Incidents, and Single Act w/G* and *Multiple Acts w/G* are very weakly positively correlated with *Gun Incidents,* for the years 1976 through 2007.

Tests: Autocorrelation and Unit Roots. The Durbin-Watson (D-W) statistic was calculated to test for autocorrelation in the data. The D-W statistic value is 0.76, and the lag-autocorrelation at 2 is 0.56 ($p = 0.00$). The null hypothesis of no serial correlation was rejected at the $p < 0.05$ level.
The Breusch-Godfrey test for serial correlation was conducted to assess the presence of autocorrelation in the data. The test statistic is calculated as 25.03, with 3 lags, and the associated p-value is less than 0.001. The null hypothesis of no serial correlation was rejected at the $p < 0.05$ level.

The Augmented Dickey-Fuller (ADF) test was performed to test for the presence of unit root in the data. The test statistic is calculated as -0.7, with 1 lag, and the associated p-value is 0.39. The null hypothesis of a unit root was not rejected at the $p < 0.05$ level.

Study 3. Studies 3a and 3b examine the relationships between measures of modeled acts of violence in the top ten films and mass shootings (1966-2021). Both studies ask what is the relationship of the modeled acts with mass shooting incidents, with fatalities during those incidents, and with injuries during those incidents.

Study 3a. The first set of analyses for the third study uses the Comprehensive Assessment of Deadly Mass Shootings, United States (2022) for years 1980 through 2018. *Mass Shootings* captures the yearly counts of mass shootings. *Fatalities* captures the yearly counts of deaths during mass shootings. *Injuries* captures the yearly counts of gunshot injuries during mass shootings.

Descriptive Statistics. For the Time Trend Control Variable: Study 3a uses *Year* observations (n = 39, min = 1980, max = 2018). For First-Differencing in regressions, *Year* observations change (n = 38, min = 1981, max = 2018).
For the Dependent Variables: study 3a runs tests for 3 different outcome variables. *Mass Shootings* ($\bar{x} = 18.44$, $s = 4.07$, min = 10, max = 26), *Fatalities* ($\bar{x} = 92.49$, $s = 28.27$, min = 41, max = 168), and *Injuries* ($\bar{x} = 39.18$, $s = 70.4$, min = 1, max = 450).
For the Independent Variables: Study 3a uses *Single Act* ($\bar{x} = 0.41$, $s = 0.13$, min = 0.1, max = 0.7), *Multiple Acts Act* ($\bar{x} = 0.34$, $s = 0.14$, min = 0.1, max = 0.6), *Single Act w/G* ($\bar{x} = 0.52$, $s = 0.16$, min = 0.2, max = 0.8), and *Multiple Acts w/G* ($\bar{x} = 0.52$, $s = 0.16$, min = 0.2, max = 0.8).
For the Control Variables: study 3a uses *GDP in Billions* ($\bar{x} = 10300.62$, $s = 5268.45$, min = 2857.31, max = 20533.06), *FA Weapons Ban* ($\bar{x} = 0.28$, $s = 0.46$, min = 0, max = 1), *Major US Military Involvement* ($\bar{x} = 0.56$, $s = 0.5$, min = 0, max = 1), and *Mental Health Issues* ($\bar{x} = 0.37$, $s = 0.1$, min = 0.2, max = 0.56).

Correlations. The four independent variables were correlated with the three different dependent variables. *Mass Shootings: Single Act (r = 0.07), Multiple Acts (r = 0.18), Single Act w/G (r = 0.00), and Multiple Acts w/G (r = -0.00). Single Act* and *Multiple Acts* are weakly negatively correlated with *Mass Shootings, and Single Act w/G* and *Multiple Acts w/G* are moderately positively correlated with *Mass Shootings,* for the years 1980 through 2018*.*

Fatalities: Single Act (r = -0.07), Multiple Acts (r = 0.09), Single Act w/G (r = 0.17), and *Multiple Acts w/G (r = 0.16). Single Act* is very weakly negatively correlated with *Fatalities,* and *Multiple Acts, Single Act w/G,* and *Multiple Acts w/G* are weakly positively correlated with *Fatalities,* for the years 1980 through 2018*.*

Injuries: Single Act (r = -0.24), Multiple Acts (r = -0.16), Single Act w/G (r = 0.33), and Multiple Acts w/G (r = 0.33). Single Act and *Multiple Acts* are weakly negatively correlated with *Injuries, and Single Act w/G* and *Multiple Acts w/G* are moderately positively correlated with *Injuries,* for the years 1980 through 2018*.*

Tests: Autocorrelation and Unit Roots. "The Durbin-Watson (D-W) statistic was calculated to test for autocorrelation in the data. The D-W statistic value is 2.08, and the lag-autocorrelation at 1 was -0.06 (p = 0.89). The null hypothesis of no serial correlation was not rejected at the $p < 0.05$ level.
The Breusch-Godfrey test for serial correlation was conducted to assess the presence of autocorrelation in the data. The test statistic is calculated as 0.16, with 1 lag, and the associated p-value was 0.69. The null hypothesis of no serial correlation was not rejected at the $p < 0.05$ level.

The Augmented Dickey-Fuller (ADF) test was performed to test for the presence of unit root in the data. The test statistic is calculated as -0.32, with 2 lags, and the associated p-value was 0.51. The null hypothesis of a unit root was not rejected at the $p < 0.05$ level.

Study 3b. The second and final set of analysis for the third study uses the Violence Project's Mass Shooter Database (2023) for years 1966 through 2021. *Mass Shootings* captures the yearly counts of mass shootings. *Fatalities* captures the yearly counts of deaths during mass shootings. *Injuries* captures the yearly counts of gunshot injuries during mass shootings.

Descriptive Statistics. For the Time Trend Control Variable: Study 3b uses *Year* observations (n = 53, min = 1966, max = 2021). For First-Differencing in regressions, *Year* observations change (n = 52, min = 1967, max = 2021).
For the Dependent Variables: study 3a runs tests for 3 different outcome variables. *Mass Shootings* ($\bar{x}$ = 3.43, s = 2.13, min = 1, max = 9), *Fatalities* ($\bar{x}$ = 24.62, s = 22.51, min = 4, max = 108), and *Injuries* ($\bar{x}$ = 38.53, s = 129.31, min = 0, max = 948).
For the Independent Variables: Study 3a uses *Single Act* ($\bar{x}$ = 0.38, s = 0.14, min = 0.1, max = 0.7), *Multiple Acts Act* ($\bar{x}$ = 0.31, s = 0.15, min = 0.0, max = 0.6), *Single Act w/G* ($\bar{x}$ = 0.52, s = 0.17, min = 0.2, max = 0.9), and *Multiple Acts w/G* ($\bar{x}$ = 0.51, s = 0.17, min = 0.2, max = 0.9).

For the Control Variables: study 3a uses *GDP in Billions* ($\bar{x}$ = 9111.12, s = 6595.08, min = 815, max = 23315.08), *FA Weapons Ban* ($\bar{x}$ = 0.21, s = 0.41, min = 0, max = 1), *Major US Military Involvement* ($\bar{x}$ = 0.62, s = 0.49, min = 0, max = 1), and *Health/Mental Health Issues* ($\bar{x}$ = 0.84, s = 0.25, min = 0, max = 1).

Correlations. The four independent variables were correlated with the three different dependent variables. *Mass Shootings: Single Act (r = 0.1), Multiple Acts (r = 0.27), Single Act w/G (r = 0.24), and Multiple Acts w/G (r = 0.25).* All are weakly positively correlated with *Mass Shootings,* for the years 1966 through 2021.

Fatalities: Single Act (r = 0.05), Multiple Acts (r = 0.18), Single Act w/G (r = 0.27), and *Multiple Acts w/G (r = 0.28).* All are weakly positively correlated with *Fatalities,* for the years 1966 through 2021.

Injuries: Single Act (r = -0.14), Multiple Acts (r = -0.07), Single Act w/G (r = 0.26), and Multiple Acts w/G (r = 0.27). Single Act and *Multiple Acts* are weakly negatively correlated with *Injuries, and Single Act w/G* and *Multiple Acts w/G* are weakly positively correlated with *Injuries,* for the years 1966 through 2021.

Tests: Autocorrelation and Unit Roots. The Durbin-Watson (D-W) statistic was calculated to test for autocorrelation in the data. The D-W statistic value is 2.05, and the lag-autocorrelation at 1 is -0.06 ($p = 0.92$). The null hypothesis of no serial correlation was not rejected at the $p < 0.05$ level.
The Breusch-Godfrey test for serial correlation was conducted to assess the presence of autocorrelation in the data. The test statistic is calculated as 0.18, with 1 lag, and the associated p-value was 0.67. The null hypothesis of no serial correlation was not rejected at the $p < 0.05$ level.

The Augmented Dickey-Fuller (ADF) test was performed to test for the presence of unit root in the data. The test statistic is calculated as 0.46, with 3 lags, and the associated p-value is 0.76. The null hypothesis of a unit root was not rejected at the $p < 0.05$ level.

Study Regressions. In light of the results from the tests for autocorrelation and unit roots, all regressions implemented First-Differenced variables and the time trend variable *Year*. First-Differencing was applied to address concerns of autocorrelation in the errors and the presence of unit roots. Furthermore, application of First-Differencing across all studies allows for easier interpretation and comparability of results.

Linear regression functional form,

$$y = \beta 0 + \beta 1 * x + \varepsilon$$

Linear regression First-Differenced functional form,

$$\Delta y_t = \beta 1 * \Delta x_t + \varepsilon_t$$

Study 1 and 2 regressions take the following functional forms,

$\Delta y_t = \Delta x_t + Year$

$\Delta y_t = \Delta x_t + Year + \Delta$`GDP in Billions`$_t$

$\Delta y_t = \Delta x_t + Year + \Delta$`GDP in Billions`$_t + \Delta$`FA Weapons Ban`$_t$

$\Delta y_t = \Delta x_t + Year + \Delta$`GDP in Billions`$_t + \Delta$`FA Weapons Ban`$_t + \Delta$`Major US Military Involvement`$_t$

Study 3 regressions take the following functional forms,

$\Delta y_t = \Delta x_t + Year$

$\Delta y_t = \Delta x_t + Year + \Delta$`GDP in Billions`$_t$

$\Delta y_t = \Delta x_t + Year + \Delta$`GDP in Billions`$_t + \Delta$`FA Weapons Ban`$_t$

$\Delta y_t = \Delta x_t + Year + \Delta$`GDP in Billions`$_t + \Delta$`FA Weapons Ban`$_t + \Delta$`Major US Military Involvement`$_t$

$\Delta y_t = \Delta x_t + Year + \Delta$`GDP in Billions`$_t + \Delta$`FA Weapons Ban`$_t + \Delta$`Major US Military Involvement`$_t +$ Δ`Mental/Health Issues`$_t$

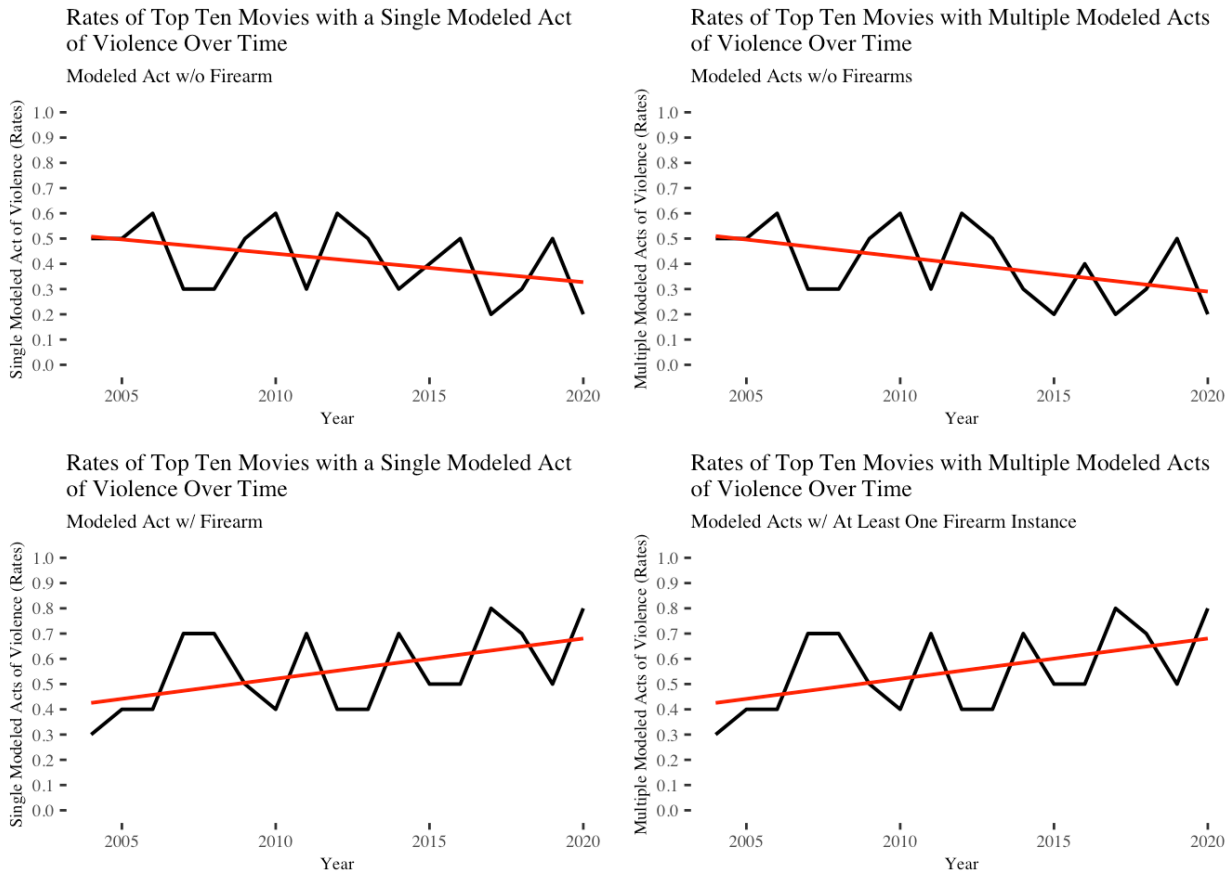
Results

All regression results are reported below, by study. In general, main effects for the Independent Variables were not found.

Study 1

Study 1a. Study 1a is based on the Small Arm Survey data. Statistical model output tables are provided in Appendix 1a, Section 3. Figure 1a.1 displays the rates of top ten movies that depicted the 4 types of modeled violence for the timespan 2004 through 2020.

Figure 1a.1.

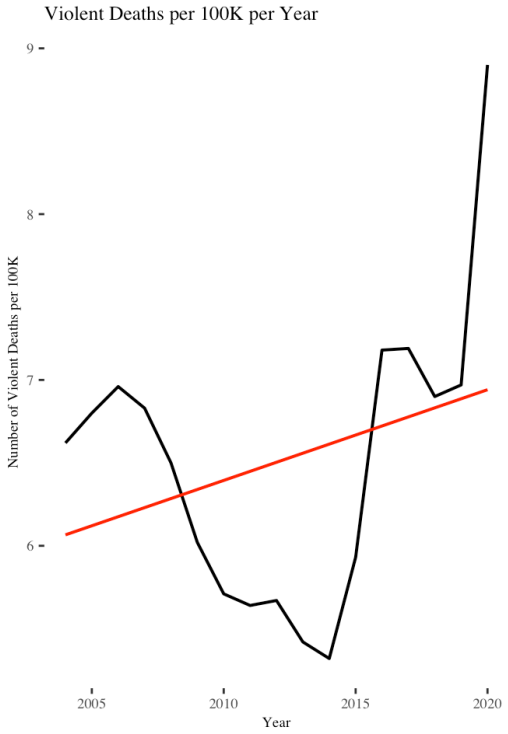


Rates of top ten movies that depict the types of modeled acts of violence, from 2004 through 2020.

Rates of both singular and multiple modeled acts of violence without inclusion of firearms are shown to decrease over the course of time. On the other hand, rates of both singular and multiple modeled acts of violence *with* the inclusion of firearms are shown to *increase* over the course of time. This seems to suggest that the depictions of modeled acts of violence with firearms is preferred over the depictions without firearms. This may indicate the popularity or the financial benefit of including these depictions.

Figure 1a.2 displays the number of deaths per 100,000 for the timespan 2004 through 2020. There is a drop in rates from 2004 through 2014, but the rates jump, approximately starting in 2015, and continue to climb through 2020.

Figure 1a.2.



Rates of deaths per 100,000, from 2004 through 2020.

Analysis results show that all First-Differenced regressions failed to find a statistically significant effect for movie violence-modeling type. The control variable *Major US Military Involvement* was dropped from the model because the data did not vary. Primary variables of interest regression model output are in Table 1a.

Table 1a.

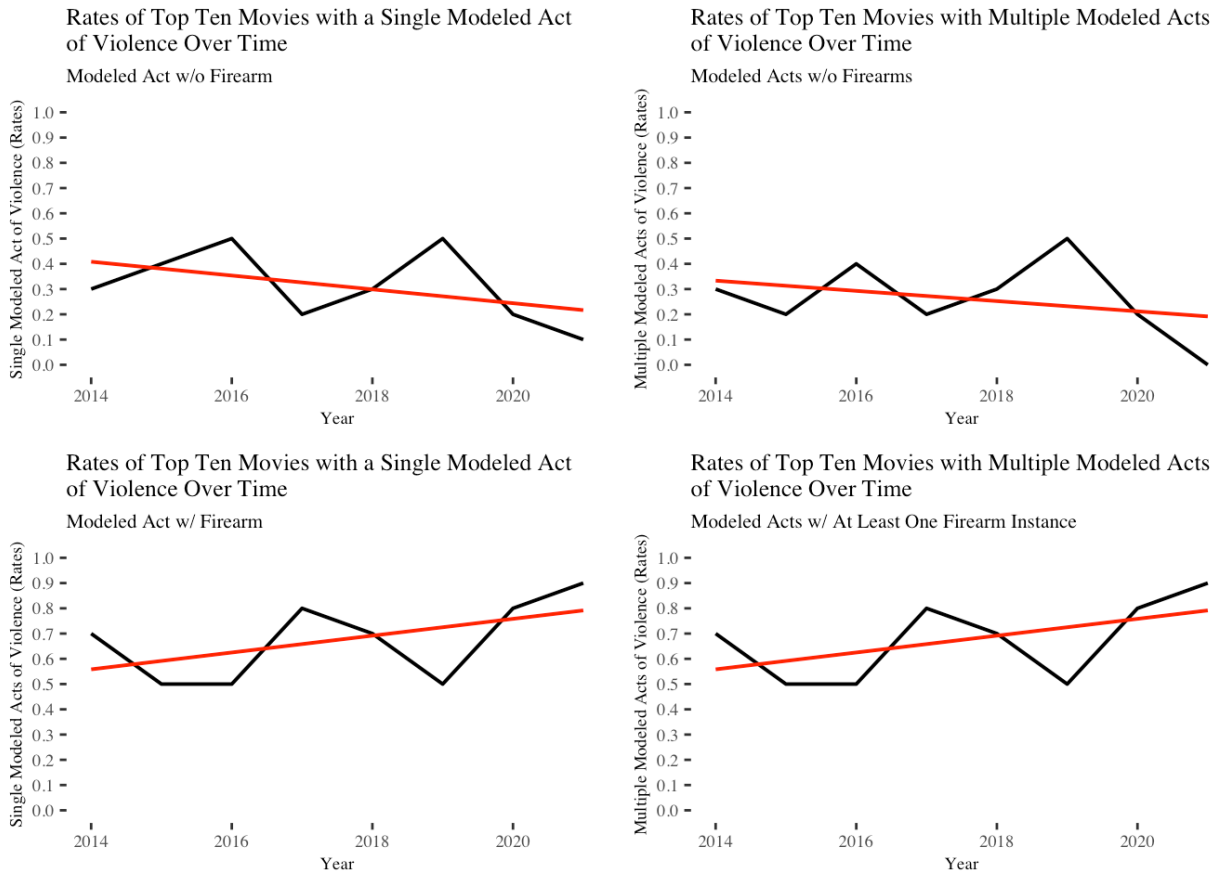
Multiple Modelings with at least one incident with GUN

	Violent Deaths per 100K FD		**Violent Deaths per 100K FD**		**Violent Deaths per 100K FD**		**Violent Deaths per 100K FD**	
Predictors	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*
(Intercept)	-126.51	0.067	-124.21	0.062	-161.03	**0.030**	-161.03	**0.030**
Multiple Acts w/G FD	0.67	0.359	0.60	0.390	0.51	0.459	0.51	0.459
Year	0.06	0.067	0.06	0.062	0.08	**0.030**	0.08	**0.030**
GDP in Billions FD			-0.00	0.162	-0.00	0.102	-0.00	0.102
FA Weapons Ban FD					-0.84	0.208	-0.84	0.208
Observations	16		16		16		16	
R^2 / R^2 adjusted	0.274 / 0.162		0.387 / 0.234		0.473 / 0.281		0.473 / 0.281	

For *Multiple Acts w/G* being regressed on *Violent Deaths per 100K,* only the intercept (-161.03, p=0.03) and *Year* (0.08, p=0.03) were statistically significant.
For *Multiple Acts* being regressed on *Violent Deaths per 100K,* only the intercept (-161, p=0.032) and *Year* (0.08, p=0.032) were statistically significant.
For *Single Act w/G* being regressed on *Violent Deaths per 100K,* only the intercept (-161.03, p=0.03) and *Year* (0.08, p=0.03) were statistically significant.
For *Single Act* being regressed on *Violent Deaths per 100K,* only the intercept (-160.56, p=0.033) and *Year* (0.08, p=0.033) were statistically significant. All regressions, share the statistically significant coefficient for *Year,* 0.08. This means, on average, net of other variables, for each increase in year, changes in *Violent Deaths per 100K* increases by 0.08.

Study 1b. Study 1b is based on the Gun Violence Archive data. Statistical model output tables are provided in Appendix 1b, Section 3. Figure 1b.1 displays the rates of top ten movies that depicted the 4 types of modeled violence for the timespan 2014 through 2021.

Figure 1b.1.



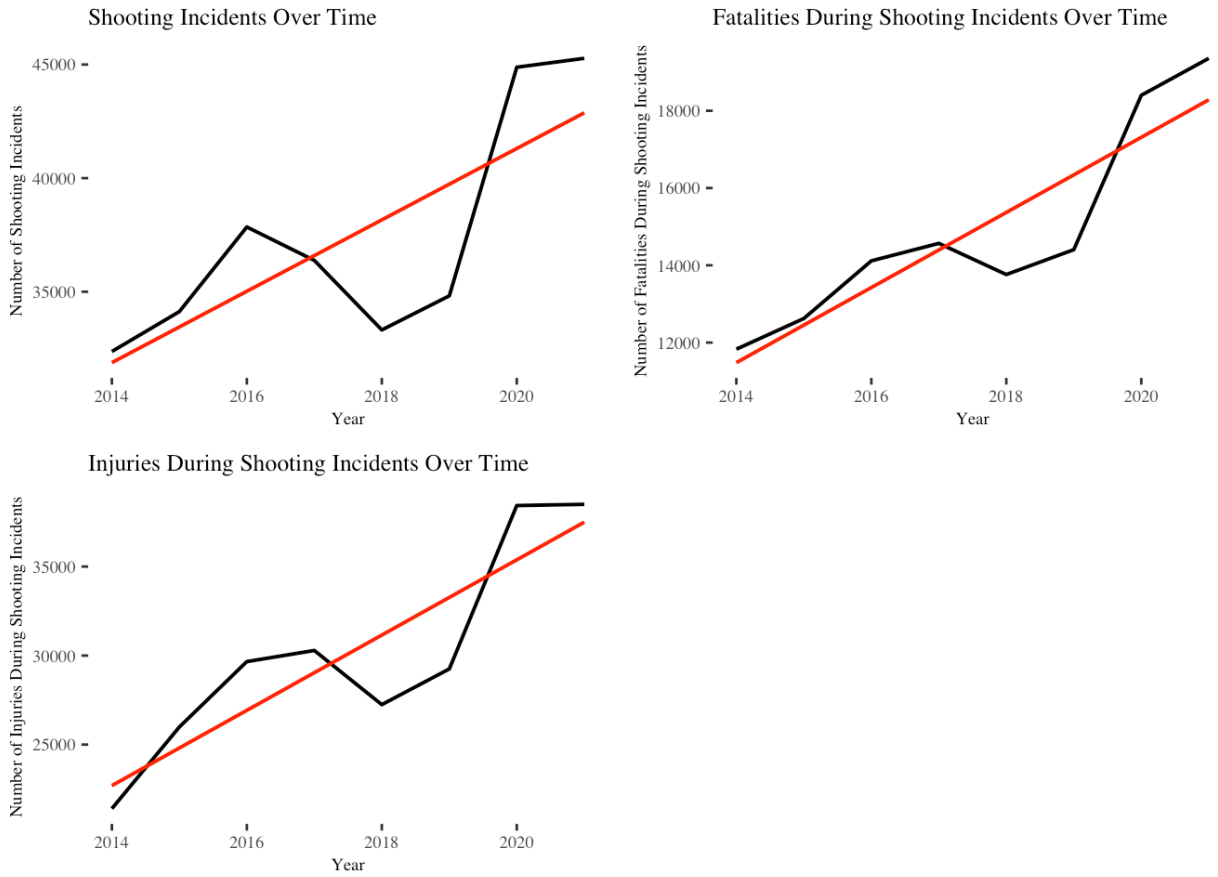
Rates of top ten movies that depict the types of modeled acts of violence, from 2014 through 2021.

Again, rates of both singular and multiple modeled acts of violence without inclusion of firearms are shown to decrease over the course of time. On the other hand, rates of both

singular and multiple modeled acts of violence *with* the inclusion of firearms are still shown to *increase* over the course of time. In this dataset the slopes of decrease and increase are slightly less extreme than study 1a. This also seems to suggest that the depictions of modeled acts of violence with firearms is preferred over the depictions without firearms. This may also indicate the popularity or the financial benefit of including these depictions. Important to note that the slight difference between studies is probably due to the inclusion of the ten preceding years in study 1a.

Figure 1b.2 displays the number of shooting incidents, fatalities during shooting incidents, and injuries during shooting incidents, for the timespan 2014 through 2021. All rates seem to increase fairly steadily from 2014 through 2021. There is a dip in shootings for 2018 – 2019, and therefore a dip in fatalities and injuries during the same time period.

Figure 1b.2.



Rates of shootings, fatalities during shootings, and injuries during shootings, from 2014 through 2021.

Analysis results show that all First-Differenced regressions failed to find a statistically significant effect for movie violence-modeling type. The control variables *FA Weapons Ban* and *Major US Military Involvement* were dropped from the model because the data did not vary. Primary variables of interest regression model output are in Table 1b.

Table 1b.

Multiple Modelings with at least one incident with GUN

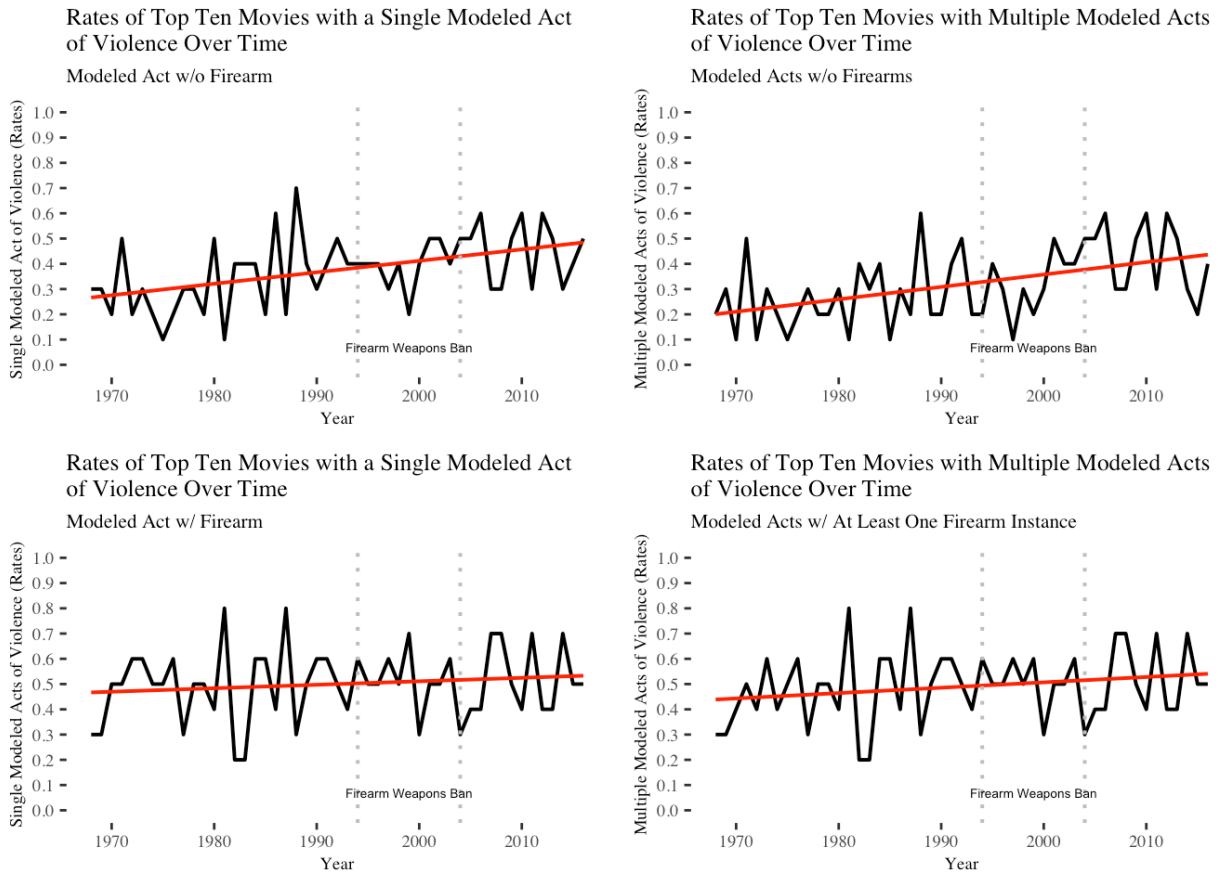
	Incidents FD		Incidents FD		Incidents FD		Incidents FD	
Predictors	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*
(Intercept)	-380919.45	0.857	-1879391.86	0.329	-1879391.86	0.329	-1879391.86	0.329
Multiple Acts w/G FD	6243.59	0.564	108.29	0.990	108.29	0.990	108.29	0.990
Year	189.59	0.857	934.08	0.328	934.08	0.328	934.08	0.328
GDP in Billions FD			-4.53	0.125	-4.53	0.125	-4.53	0.125
Observations	7		7		7		7	
R^2 / R^2 adjusted	0.130 / -0.305		0.650 / 0.300		0.650 / 0.300		0.650 / 0.300	

For *Multiple Acts w/G* being regressed on *Incidents, Fatalities,* or *Injuries,* there were no statistically significant results.
For *Multiple Acts* being regressed on *Incidents, Fatalities,* or *Injuries,* there were no statistically significant results.
For *Single Act w/G* being regressed on *Incidents, Fatalities,* or *Injuries,* there were no statistically significant results.
For *Single Act* being regressed on *Incidents, Fatalities,* or *Injuries,* there were no statistically significant results.

Study 2

Study 2a. Study 2a is based on the Center for Disease Control and Prevention's Compressed Mortality data. Statistical model output tables are provided in Appendix 2a, Section 3. Figure 2a.1 displays the rates of the top ten movies that depicted the 4 types of modeled violence for the timespan 1968 through 2016.

Figure 2a.1.

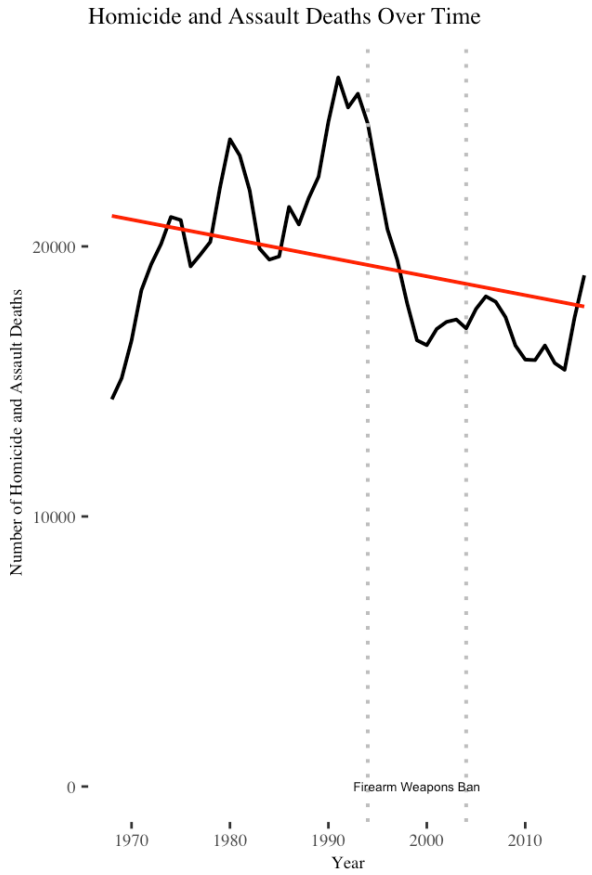


Rates of top ten movies that depict the types of modeled acts of violence, from 1968 through 2016.

Rates of both singular and multiple modeled acts of violence without inclusion of firearms are shown to increase over the course of time. Similarly, but not as pronounced, rates of both singular and multiple modeled acts of violence with the inclusion of firearms are shown to increase slightly over the course of time. This seems to suggest that the depictions of modeled acts of violence in general, are preferred. This may still indicate either the popularity or the financial benefit of including these types of depictions.

Figure 2a.2 displays the number of homicide or assault deaths for the timespan 1968 through 2016. The trend decreases over the course of time, however, number of deaths were increasing aggressively until the early 1990s, when the Federal Assault Weapons Ban took effect. After the ban, deaths decreased rapidly. The data seems to suggest that after 2010, deaths rates are climbing through 2016.

Figure 2a.2.



Rates of homicide and assault deaths, from 1968 through 2016.

Analysis results show that all First-Differenced regressions failed to find a statistically significant effect for movie violence-modeling type. All control variables were present in the model. Primary variables of interest regression model output are in Table 2a.

Table 2a.

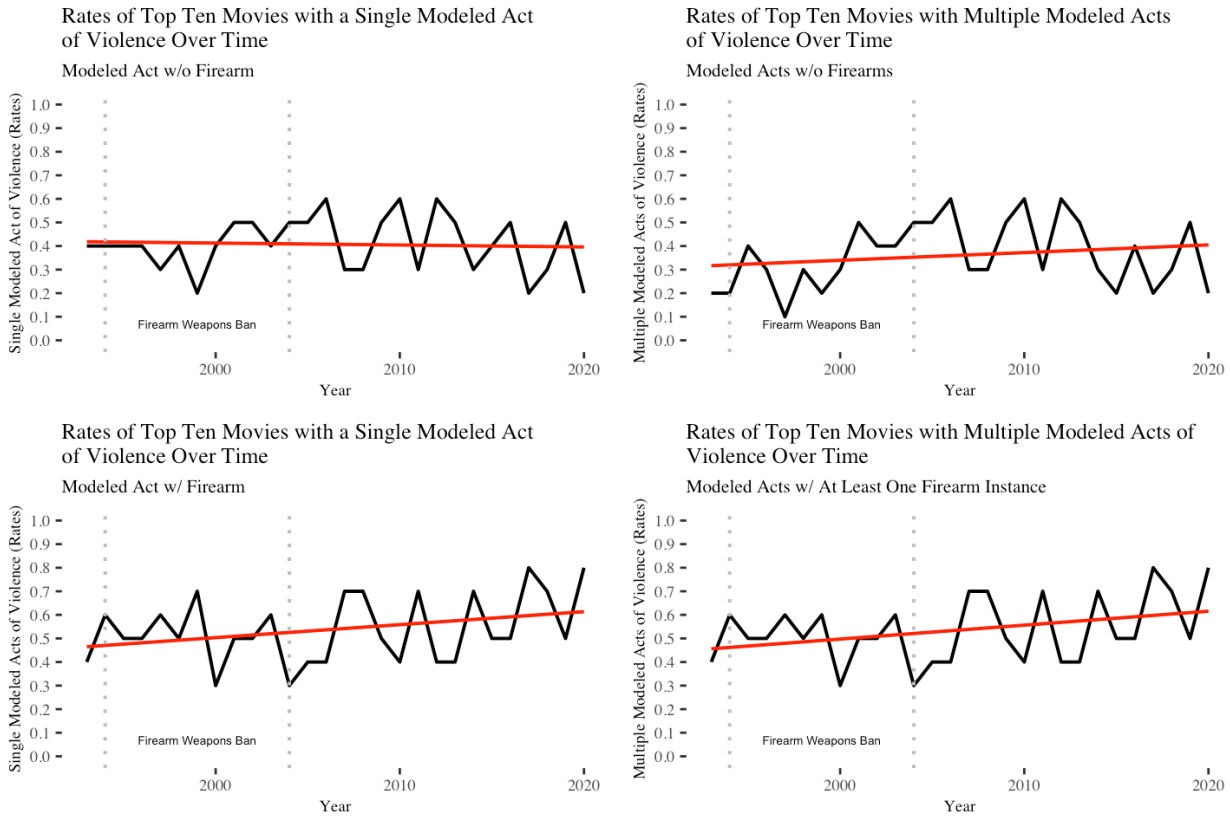
Multiple Modelings with at least one incident with GUN

	Deaths per Year FD		Deaths per Year FD		Deaths per Year FD		Deaths per Year FD	
Predictors	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*
(Intercept)	30315.75	0.218	34811.57	0.305	32189.56	0.342	40456.83	0.227
Multiple Acts w/G FD	-363.42	0.644	-388.04	0.630	-319.04	0.692	-385.83	0.623
Year	-15.17	0.220	-17.46	0.309	-16.10	0.347	-20.29	0.231
GDP in Billions FD			0.21	0.845	-0.02	0.985	0.19	0.862
FA Weapons Ban FD					-990.68	0.250	-969.74	0.249
Major US Military Involvement FD							846.67	0.081
Observations	48		48		48		48	
R^2 / R^2 adjusted	0.037 / -0.006		0.038 / -0.028		0.067 / -0.019		0.133 / 0.030	

For *Multiple Acts w/G* being regressed on *Deaths per Year,* there was no statistically significant result.
For *Multiple Acts* being regressed on *Deaths per Year,* there was no statistically significant result.
For *Single Act w/G* being regressed on *Deaths per Year,* there was no statistically significant results.
For *Single Act* being regressed on *Deaths per Year,* there was no statistically significant result.

Study 2b. Study 2b is based on the Firearm Injury Surveillance data. Statistical model output tables are provided in Appendix 2b, Section 3. Figure 2b.1 displays the rates of the top ten movies that depicted the 4 types of modeled violence for the timespan 1993 through 2020.

Figure 2b.1.

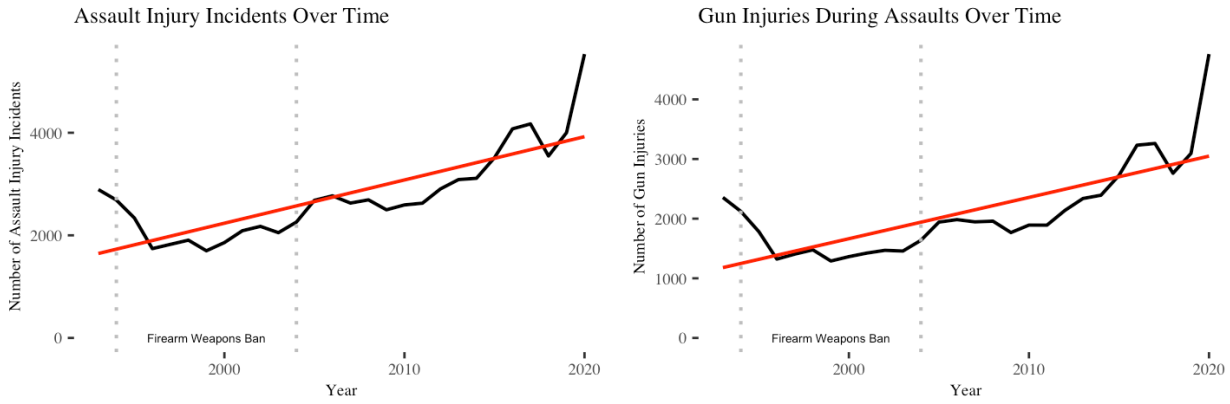


Rates of top ten movies that depict the types of modeled acts of violence, from 1993 through 2020.

Rates of a singular modeled act of violence without firearms seems to decrease extremely slightly, and rates of multiple modeled acts of violence without inclusion of firearms are shown to increase slightly over the course of time. Rates of both singular and multiple modeled acts of violence *with* the inclusion of firearms are shown to *increase* slightly over the course of time. This seems to be relatively consistent with the previous studies. This may indicate either the popularity or the financial benefit of including these types of depictions.

Figure 2b.2 displays the number of assault injury instances and assault gun injury instances for the timespan 1993 through 2020. Both trends seem to steadily increase over the course of time, approximately doubling over three decades.

Figure 2b.2.



Rates of assaults that caused injuries, and assault that caused gun injuries, from 1993 through 2020.

Analysis results show that all First-Differenced regressions failed to find a statistically significant effect for movie violence-modeling type. All control variables were present in the model. Primary variables of interest regression model output are in Table 2b.

Table 2b.

Multiple Modelings with at least one incident with GUN

	Assault FD		**Assault FD**		**Assault FD**		**Assault FD**	
Predictors	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*
(Intercept)	-48580.87	**0.014**	-52847.84	**0.005**	-49250.28	**0.009**	-48326.46	**0.013**
Multiple Acts w/G FD	158.96	0.672	54.19	0.878	77.99	0.824	74.87	0.834
Year	24.25	**0.014**	26.51	**0.005**	24.73	**0.009**	24.27	**0.012**
GDP in Billions FD			-0.50	**0.041**	-0.54	**0.029**	-0.55	**0.030**
FA Weapons Ban FD					-288.06	0.261	-293.29	0.262
Major US Military Involvement FD							-99.57	0.632
Observations	27		27		27		27	
R^2 / R^2 adjusted	0.235 / 0.171		0.364 / 0.281		0.400 / 0.291		0.407 / 0.266	

For *Multiple Acts w/G* being regressed on *Assault,* only the intercept (-48326.46, p=0.013), *Year* (24.27, p=0.012), and *GDP in Billions* (-0.55, p=0.03), were statistically significant.
For *Multiple Acts w/G* being regressed on *Gun Injuries,* only the intercept (*-2.67*, p= *0.025*), *Year* (0.00, p=0.025), and *GDP in Billions* (-0.6, p=0.012), were statistically significant.

For *Multiple Acts* being regressed on *Assault,* only the intercept (-48576.64, p=0.013), *Year* (24.40, p=0.012), and *GDP in Billions* (-0.56, p=0.028), were statistically significant .

For *Multiple Acts* being regressed on *Gun Injuries,* only the intercept (-48894.37, p=0.007), *Year* (24.57, p=0.006), and *GDP in Billions* (-0.6, p=0.012), were statistically significant .

For *Single Act w/G* being regressed on *Assault,* only the intercept (-48470.72, p=0.012), *Year* (24.35, p=0.012), and *GDP in Billions* (-0.56, p=0.029), were statistically significant.
For *Single Act w/G* being regressed on *Gun Injuries,* only the intercept (-49144.71, p=0.006), *Year* (0.08, p=0.03), and *GDP in Billions* (-0.6, p=0.011), were statistically significant.

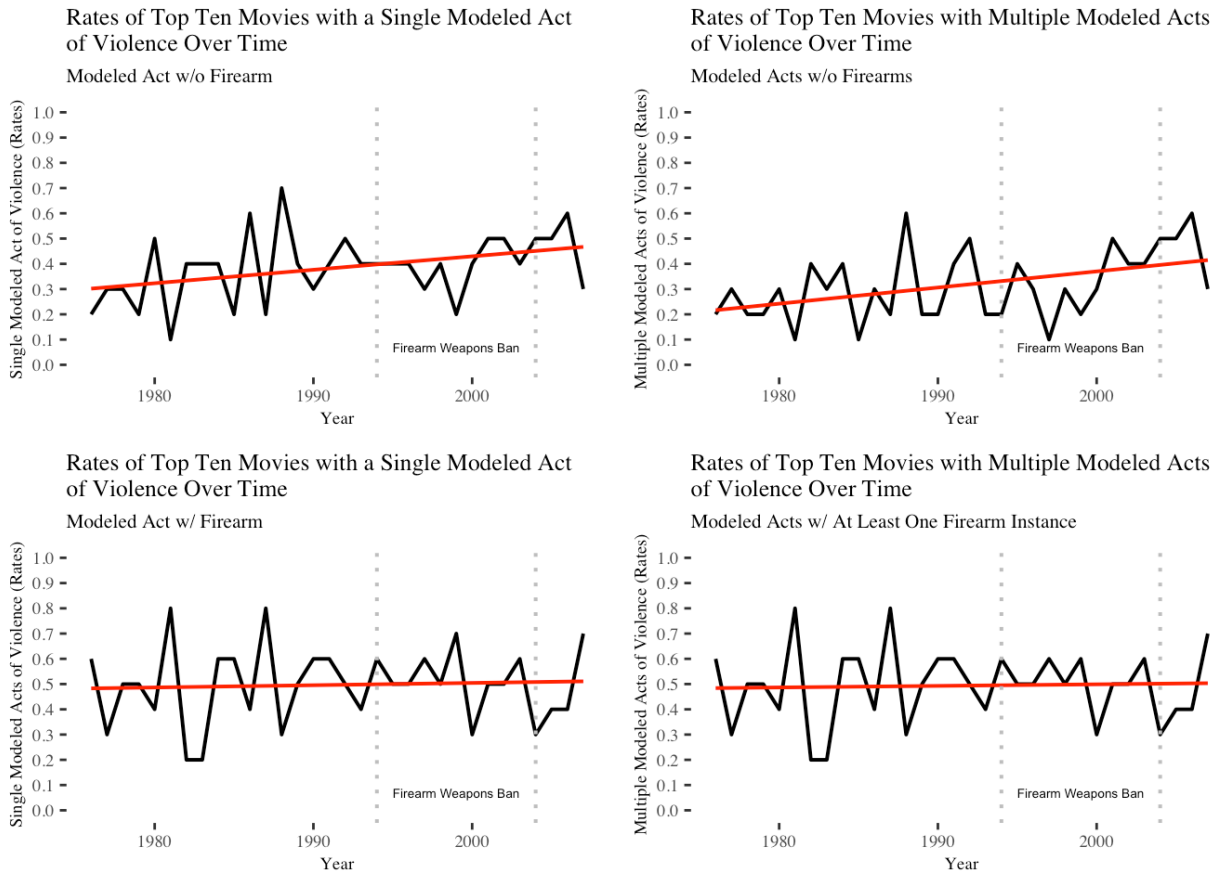
For *Single Act* being regressed on *Assault,* only the intercept (-48690.72, p=0.012), *Year* (24.46, p=0.012), and *GDP in Billions* (-0.56, p=0.028), were statistically significant.
For *Single Act* being regressed on *Gun Injuries,* only the intercept (-49030.12, p=0.007), *Year* (24.63, p=0.006), and *GDP in Billions* (-0.6, p=0.011), were statistically significant.

All regressions on *Assault* and on *Gun Injuries*, share a similar statistically significant coefficient for *Year, ~24*. This means, on average, net of other variables, for each increase in year, changes in incidents of injuries by *Assault* and incidents of *Gun Injuries* by assault increase by approximately 24.

All regressions on *Assault* share a similar statistically significant coefficient for *GDP in Billions*, ~-0.56. This means, on average, net of other variables, for each billion-dollar increase change in GDP, changes in *Assault* injury incidents decrease by approximately 0.56. All regressions on *Gun Injuries* share the same statistically significant coefficient for *GDP in Billions*, -0.6. This means, on average, net of other variables, for each billion-dollar increase change in GDP, changes in assault *Gun Injuries* incidents decrease by approximately 0.6.

Study 2c. Study 2c is based on the Uniform Crime Reports: Supplementary Homicide Reports data. Statistical model output tables are provided in Appendix 2c, Section 3. Figure 2c.1 displays the rates of the top ten movies that depicted the 4 types of modeled violence for the timespan 1976 through 2007.

Figure 2c.1.

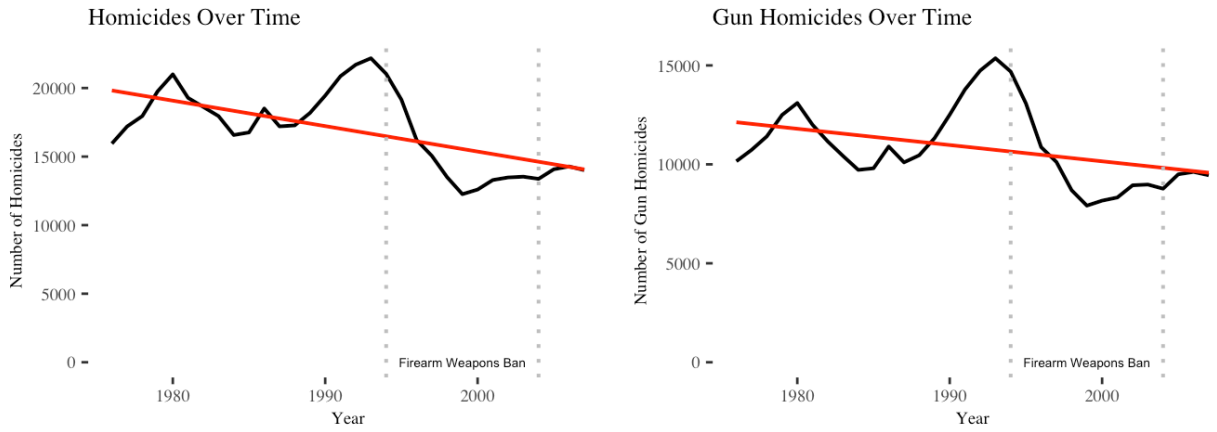


Rates of top ten movies that depict the types of modeled acts of violence, from 1976 through 2007.

Rates of a singular and multiple modeled acts of violence without inclusion of firearms are shown to increase slightly over the course of time. Rates of both singular and multiple modeled acts of violence with the inclusion of firearms are shown to maintain relatively consistent over the course of time. This seems to deviate slightly from the previous studies where the rates of modeling type *with* firearms does not increase.

Figure 2c.2 displays the number of homicides and homicides with firearms for the timespan 1976 through 2007. Both trends seem to steadily decrease over the course of time, dropping approximately by 25%.

Figure 2c.2.



Rates of homicide, and gun homicide, from 1976 through 2007.

Analysis results show that all First-Differenced regressions failed to find a statistically significant effect for movie violence-modeling type. All control variables were present in the model. Primary variables of interest regression model output are in Table 2c.

Table 2c.

Multiple Modelings with at least one incident with GUN

	Incident FD		**Incident FD**		**Incident FD**		**Incident FD**	
Predictors	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*
(Intercept)	46294.37	0.338	28557.45	0.723	14295.46	0.859	16715.73	0.843
Multiple Acts w/G FD	-1051.16	0.252	-1024.80	0.274	-903.80	0.329	-914.65	0.336
Year	-23.27	0.338	-14.25	0.727	-6.92	0.865	-8.15	0.849
GDP in Billions FD			-0.59	0.782	-1.42	0.518	-1.34	0.565
FA Weapons Ban FD					-1191.23	0.192	-1182.69	0.205
Major US Military Involvement FD							64.07	0.911
Observations	31		31		31		31	
R^2 / R^2 adjusted	0.082 / 0.017		0.085 / -0.017		0.144 / 0.012		0.145 / -0.027	

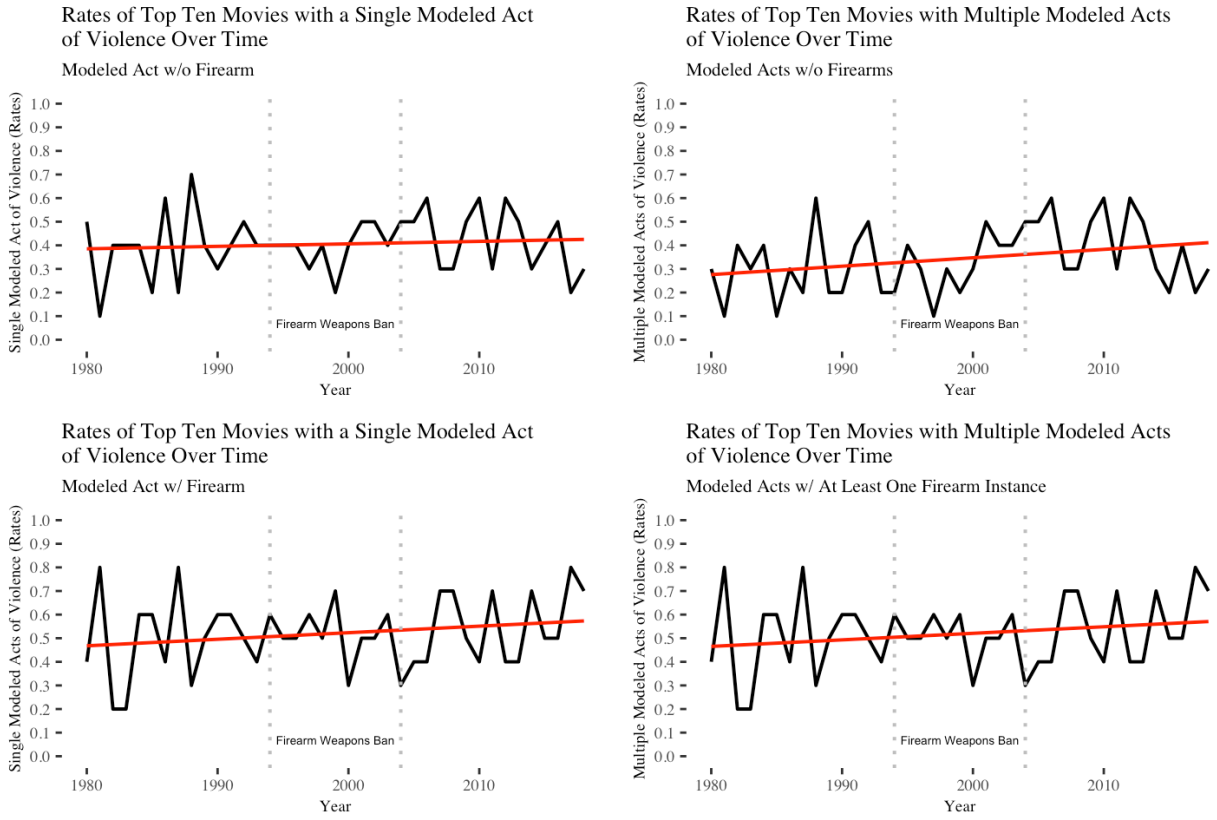
For *Multiple Acts w/G* being regressed on *Incident* and *Gun Incident,* there were no statistically significant results.
For *Multiple Acts* being regressed on *Incident* and *Gun Incident,* there were no statistically significant results.
For *Single Act w/G* being regressed on *Incident* and *Gun Incident,* there were no statistically significant results.

For *Single Act* being regressed on *Incident* and *Gun Incident,* there were no statistically significant results.

Study 3

Study 3a. Study 3a is based on the A Comprehensive Assessment of Deadly Mass Shootings data. Statistical model output tables are provided in Appendix 3a, Section 3. Figure 3a.1 displays the rates of the top ten movies that depicted the 4 types of modeled violence for the timespan 1980 through 2018.

Figure 3a.1.



Rates of top ten movies that depict the types of modeled acts of violence, from 1980 through 2018.

Rates of types of modeled acts of violence with and without inclusion of firearms are shown to increase slightly over the course of time. This seems to align, relatively speaking, with the bulk of previous studies.

Figure 3a.2 displays the number of mass shootings, fatalities during mass shootings, and injuries during mass shootings for the timespan 1980 through 2018. All trends show a steady increase over the course of time and a spike in cases before and after the Federal Assault Weapons Ban, 1994-2004. Mass shootings trend shows an increase by approximately 25% and fatalities trend shows an increase by approximately 50%. Most striking, is the spike in injuries during mass shootings that occurs toward the end of the time span, approximately 2014-2018. This seems

indicative of the breadth of damage that shooters are now able to inflict with such weapons as the AR-15.

Figure 3a.2.

Rates of mass shootings, and fatalities and injuries during mass shootings, from 1980 through 2018.

Analysis results show that all First-Differenced regressions failed to find a statistically significant effect for movie violence-modeling type. All control variables including *Mental Health Issues* were present in the model. Important to note, *Mental Health Issues* did not have a statistically significant result. Primary variables of interest regression model output are in Table 3a.

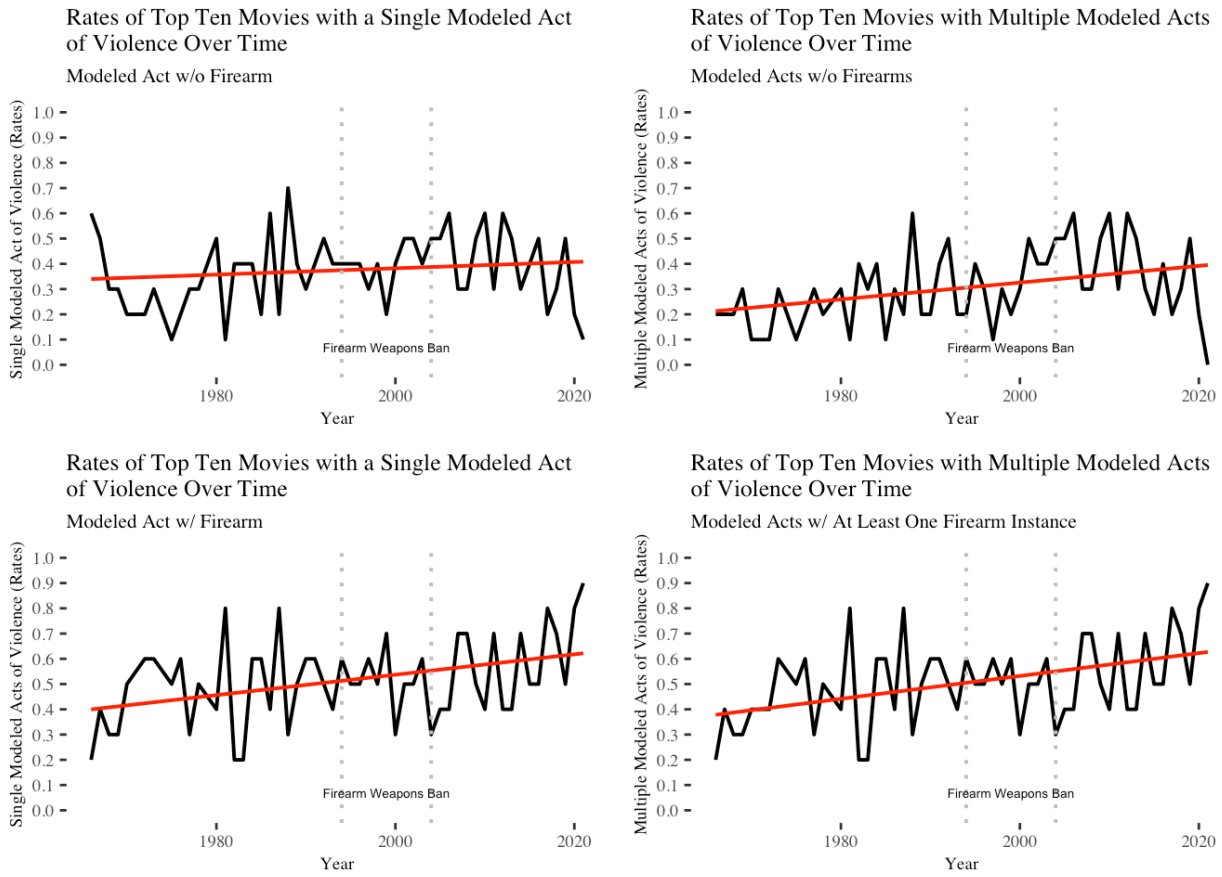
Table 3a.
Multiple Modelings with at least one incident with GUN

	Mass Shootings FD		Mass Shootings FD		Mass Shootings FD		Mass Shootings FD		Mass Shootings FD	
Predictors	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*
(Intercept)	-28.67	0.866	-110.37	0.593	-109.19	0.589	-108.20	0.599	-106.09	0.612
Multiple Acts w/G FD	-3.58	0.373	-3.15	0.441	-2.66	0.506	-2.69	0.510	-2.63	0.526
Year	0.01	0.866	0.06	0.590	0.06	0.584	0.06	0.594	0.05	0.607
GDP in Billions FD			-0.00	0.479	-0.00	0.330	-0.00	0.346	-0.00	0.361
FA Weapons Ban FD					-6.51	0.119	-6.50	0.125	-6.30	0.150
Major US Military Involvement FD							0.23	0.929	0.28	0.915
Mental Health Issues FD									1.95	0.811
Observations	38		38		38		38		38	
R^2 / R^2 adjusted	0.023 / -0.032		0.038 / -0.047		0.107 / -0.001		0.107 / -0.032		0.109 / -0.063	

For *Multiple Acts w/G* being regressed on *Mass Shootings, Fatalities,* or *Injuries,* there were no statistically significant results.
For *Multiple Acts* being regressed on *Mass Shootings, Fatalities,* or *Injuries,* there were no statistically significant results.
For *Single Act w/G* being regressed on *Mass Shootings, Fatalities,* or *Injuries,* there were no statistically significant results.
For *Single Act* being regressed on *Mass Shootings, Fatalities,* or *Injuries,* there were no statistically significant results.

Study 3b. Study 3b is based on The Violence Project Mass Shootings data. Statistical model output tables are provided in Appendix 3b, Section 3. Figure 3b.1 displays the rates of the top ten movies that depicted the 4 types of modeled violence for the timespan 1966 through 2021.

Figure 3b.1.

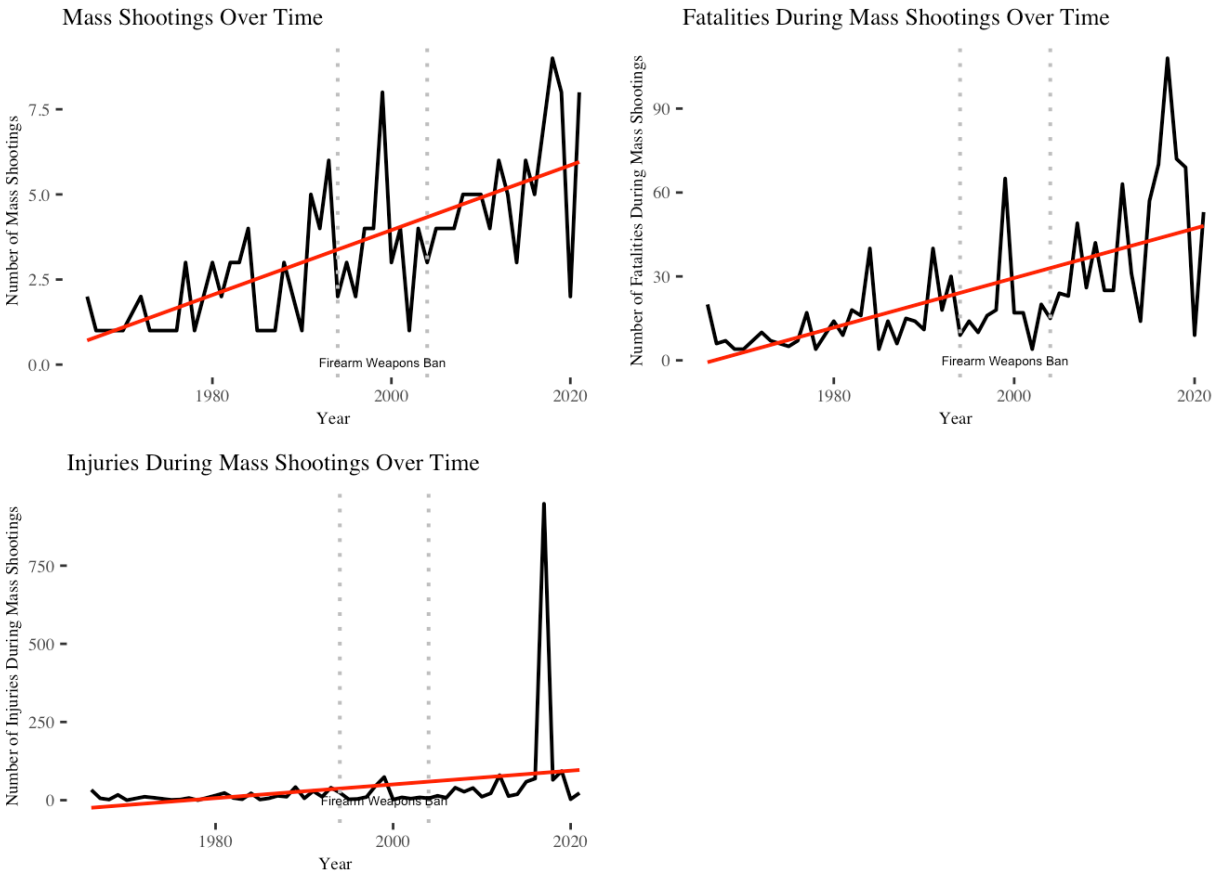


Rates of top ten movies that depict the types of modeled acts of violence, from 1966 through 2021.

Rates of types of modeled acts of violence with and without inclusion of firearms are shown to increase slightly and fairly steady over the course of time. This seems to align, relatively speaking, with the bulk of previous studies.

Figure 3b.2 displays the number of mass shootings, fatalities during mass shootings, and injuries during mass shootings for the timespan 1966 through 2021. All trends show a steady increase over the course of time. These figures show a spike in cases during the years the Federal Assault Weapons Ban was in effect, 1994-2004. All trends show an aggressive increase in cases. Again, most striking, is the spike in injuries during mass shootings that occurs toward the end of the time span, approximately 2014-2019. This seems indicative of the breadth of damage that shooters are now able to inflict with such weapons as the AR-15.

Figure 3b.2.



Rates of mass shootings, and fatalities and injuries during mass shootings, from 1966 through 2021.

Analysis results show that all First-Differenced regressions failed to find a statistically significant effect for movie violence-modeling type. All control variables including Health/*Mental Health* were present in the model. Important to note, Health/*Mental Health* did not have a statistically significant result. Primary variables of interest regression model output are in Table 3b.

Table 3b.

Multiple Modelings with at least one incident with GUN

	Mass Shootings FD		Mass Shootings FD		Mass Shootings FD		Mass Shootings FD		Mass Shootings FD	
Predictors	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*	*Estimates*	*p*
(Intercept)	-14.24	0.713	66.82	0.109	67.71	0.101	68.59	0.102	73.06	0.083
Multiple Acts w/G FD	-1.74	0.214	-1.76	0.161	-1.68	0.176	-1.69	0.179	-1.94	0.130
Year	0.01	0.711	-0.03	0.105	-0.03	0.097	-0.03	0.098	-0.04	0.079
GDP in Billions FD			0.00	**0.001**	0.00	**0.001**	0.00	**0.001**	0.00	**0.001**
FA Weapons Ban FD					-2.00	0.151	-1.99	0.155	-1.68	0.239
Major US Military Involvement FD							0.18	0.825	0.42	0.616
Health/Mental Health FD									0.86	0.288
Observations	52		52		52		52		52	
R^2 / R^2 adjusted	0.034 / -0.006		0.245 / 0.198		0.278 / 0.216		0.278 / 0.200		0.297 / 0.203	

For *Multiple Acts w/G* being regressed on *Mass Shootings,* only *GDP in Billions* (0.00, p=0.001), was statistically significant.
For *Multiple Acts w/G* being regressed on *Fatalities,* only *GDP in Billions* (0.03, p=0.011), was statistically significant.
For *Multiple Acts w/G* being regressed on *Injuries,* there were no statistically significant results.

For *Multiple Acts* being regressed on *Mass Shootings,* only *GDP in Billions* (0.00, p=0.001), was statistically significant.
For *Multiple Acts* being regressed on *Fatalities,* only *GDP in Billions* (0.03, p=0.01), was statistically significant.
For *Multiple Acts* being regressed on *Injuries,* there were no statistically significant results.

For *Single Act w/G* being regressed on *Mass Shootings,* only *GDP in Billions* (0.00, p=0.001), was statistically significant.
For *Single Act w/G* being regressed on *Fatalities,* only *GDP in Billions* (0.03, p=0.012), was statistically significant.
For *Single Act w/G* being regressed on *Injuries,* there were no statistically significant results.

For *Single Act* being regressed on *Mass Shootings,* only *GDP in Billions* (0.00, p=0.001), was statistically significant.
For *Single Act* being regressed on *Fatalities,* only *GDP in Billions* (0.03, p=0.012), was statistically significant.
For *Single Act* being regressed on *Injuries,* there were no statistically significant results.

All regressions on *Mass Shootings* share a similar statistically significant coefficient for *GDP in Billions*, ~0.003. This means, on average, net of other variables, for each billion-dollar increase change in GDP, changes in incidents of *Mass Shootings* increase by approximately 0.003.
All regressions on *Fatalities* share the same statistically significant coefficient for *GDP in Billions*, 0.03. This means, on average, net of other variables, for each billion-dollar increase change in GDP, changes in incidents of *Fatalities* by assault increase by approximately 0.03.

Discussion

For this exploratory analysis, the top ten movies from 1961 through 2021 were coded for modeled acts of violence, and whether the acts utilized any firearms. This data was merged by year with 7 data sets of measures of societal violence. Correlations and regression models were run.

All regression analyses returned statistically insignificant results on the primary variables of interest, the measures of modeled acts of violence and societal violence. However, three of the subsets of analyses returned statistically significant results on the control variables for GDP and the time trend, year. Study 1a and 2b showed an effect for *Year.* Study 1a supports the notion that a general small increase in the changes (between years) in *Violent Deaths per 100K* occurs over time. Study 2b also supports the notion that a general increase in the changes (between years) in *Assault* and *Gun Injuries* occurs over time. Study 2b also shows an effect for GDP, that as changes (between years) in *US GDP in Billions* increase*,* both changes in assault injury incidents and assault gun injury incidents decrease slightly. Study 3b showed an effect for GDP as well, however, to the contrary of study 2b. Here, as changes (between years) in *US GDP in Billions* increase*,* both changes in mass shooting incidents and fatalities during incidents, *increase* slightly. It seems the results in the research topic of film's influence on societal violence remains unclear.

Though not statistically significant for the primary variables, study 1a shows that the direction of the effect for both single and multiple modeled acts of violence *with firearm*, is positive. This is consistent with the notion that modeled acts of violence move with the measure for societal violence, *Violent Deaths per 100K.* Whereas, the direction of the effect for both single and multiple modeled acts of violence *without firearm*, is negative. Modeled acts of violence *without firearm* moves in opposite with the measure for societal violence.

Study 2a also shows statistically insignificant results for the primary variables, but the direction of the effect for both single and multiple modeled acts of violence *with firearm*, is also positive. Again, the direction of the effect for both single and multiple modeled acts of violence *without firearm*, is in general, negative. This is consistent with the notion that modeled acts of violence move with the measure for societal violence, *Assault* injury incidents and assault *Gun Injuries* incidents. Whereas, Modeled acts of violence *without firearm* moves in opposite with the measure for societal violence.

Study 3b, though not statistically significant for the primary variables, shows confusing results. Modeled acts with firearms, return mixed directionality of effects. For both multiple modeled acts with firearm, and single modeled act with firearm, the coefficients for mass shootings and fatalities during mass shootings are negative, but the coefficient for injuries during mass shootings is positive. For multiple modeled acts without firearm, and single modeled act with firearm, it's reversed. The coefficients for mass shootings and fatalities during mass shootings are positive, but the coefficient for injuries during mass shootings is negative.

Weaknesses. These film measures may not be accurately representative of the desired construct – violence depicted in cultural products. Furthermore, modeled acts of violence rating, was coded alone by the researcher. There was no inter-rater reliability check. It is possible that criteria were either too broad or too narrow, or worse, inconsistent. In addition, modeled acts were measured as 1 and 2 or more. Measuring 1, 2, 3, 4, and 5+ modeled acts would a) be more detailed and b) allow for a better comparison when examining the mass shooting datasets, by matching the exact definition[8] of mass shooting. Alternatively, resorting to the top ten films for each year, may not have captured enough information, having the top 20 or 25, may better capture what the public consumes. In fact, movies may not be the best representative cultural product to examine. Television/on demand streaming shows and series in general may better reflect the general population's entertainment consumption habits. Ideally, a composite measure of cultural products (movies, shows, and music lyrics) would be calculated.

Review and Recourse. Cultural patterns evolve and decline over time, reflecting the changing values and attitudes of a particular society. Yet, as individuals actively construct their own cultural experiences, culture shapes our cognition and social behavior. Cultural norms, values, and beliefs have a profound impact on perceptions, attitudes, and behaviors, shaping the way individuals perceive and interpret the world around them. It seems there potentially could be something going on with the modeled acts in the top ten films, the question is are we able to see it in the data at hand? The entertainment industry is by far the largest producer of popular cultural products. And, entertainment products can blur the lines between entertainment and persuasion; entertainment media is used to convey cues and associations with what holds cultural value and social capital. They shape and reflect cultural attitudes and values, shaping public opinion and the cultural contexts as trends flux. Movies can impact our moral values and attitudes, shaping cultural norms and traditions. Above, exposure to media violence was shown to be associated with permissive attitudes towards guns/gun violence, an increased likelihood of criminal aggression, desensitization to violence, and an increase in aggressive behaviors and thoughts in general.

By no means is this to imply humans are so easily influenced, particularly by stimuli such as modeled acts of violence in movies. Acts of violence are surely the result of various factors and complex interactions. For instance, the role of socialization in shaping individuals' tendencies towards violence, certain types of social influences are more likely to encourage criminal or

[8] The intentional killing of four or more people at a single location with no cooling-off period between the murders.

violent behavior. Individuals learn to engage with violence in certain ways through socialization and others' role modeling. Or, perhaps, cultural values and beliefs shape our social interactions and cognitive processes, including how we perceive ourselves and others, what we consider to be normal behavior, and what we see as appropriate ways to respond to different social situations and circumstances. The individuals' internalized dispositions and ways of thinking are deeply ingrained and shaped by social and cultural contexts. Perhaps, the social norms that emphasize aggression and competition, in effect socializing individuals into violent or aggression-oriented behavior patterns, is the driver. It is important to recall Freud's point on the internal conflict that arises in all of us while living within society, the conflict between individual desires and the demands of society, it all but guarantees frustration and violence (1930/1961). When individuals experience a strain between their goals and their means to achieve them, they may resort to deviant behavior, including violence.

This touches on the sense of agency, the sense of one's degree of powerlessness. Violence is the result of powerlessness; it arises when people feel they have no other means to achieve their goals. This taps into subjective frustration. Engaging in violent behavior is a way of asserting control and gaining a sense of power, it is rooted in deeply emotional and affective processes. Shame and guilt are important psychological factors that can lead to violent behavior, particularly in cases where individuals feel that their sense of self-worth is threatened. Shame arises from a sense of powerlessness and a lack of control over one's life. A sense of shame and humiliation results from social inequality and marginalization (experiences of humiliation, disrespect, and degradation), and violent behavior is often an attempt to restore a sense of dignity and respect; to restore a sense of agency.

Societies that promote a culture of violence and aggression tend to produce individuals who are more likely to engage in violent behavior. Individualistic cultures prioritize independence and uniqueness. Individualism emphasizes autonomy, independence, and self-reliance; and, within individualistic cultures, uniqueness is more highly valued and deviance is less likely to be punished. In cultures that emphasize uniqueness, individuals may be more likely to engage in violent behavior as a means of asserting their individuality and deviating from group norms. Loose cultures, those that prioritize uniqueness, generally have weaker social norms and are more accepting of deviant behavior and are therefore more prone to violence. There is a relative lack of social control. There are also few safe guards set in place.

Violence is also linked to cultural constructions of masculinity that emphasize aggression, dominance, and control. Cultural ideals encourage men to prioritize power and control over empathy and cooperation. Moreover, these constructs are perpetuated through cultural products. Violence is a central theme in modern media, and the depiction of violence in popular culture contributes to its normalization and acceptance. Media and popular culture can reinforce patterns of violent behavior.

American culture is characterized by competition, aggression, and a hyper focus on individualism; the way in which individuals express their aggression and hostility is shaped by the same societal norms, values, and beliefs. Importantly, guns are tied to American notions of

individualism and self-reliance; they played a significant role in the founding and expansion of the United States. What's more, gun ownership has been linked to the notion of masculinity in American culture, with guns being seen as a symbol of strength and power.

Naturally, individual differences also bear their influence. Cultural factors interact with individual factors to shape responses to different situations. Individuals with low self-control are more likely to engage in impulsive, risky, and violent behavior. Personality traits and an individual's moral development impact how one makes choices and react to adverse life events. Exclusion from mainstream society, a sense of social isolation and a desire for attention, shapes violent behavior. Many mass murderers have experienced some form of personal or professional failure, or had reasons related to revenge or attention-seeking. It is imperative to understand that one viewer of a film may not walk away with the same impressions and understandings as another viewer.

It seems unlikely that a singular solution to the (gun) violence issue in America will present itself. Much less likely is an opportunity of an effective intervention for those at highest risk of delinquency. To successfully intervene and prevent (gun) violence and mass shootings, would require social programs. It is much more probable that policies aimed at actually reducing gun ownership would have a significantly greater impact on violence in America. In fact, it has already been demonstrated as noted by the Federal Assault Weapons Ban.

The argument is that culture and cultural products, films and other even more ubiquitous cultural products, serve as reference points for a broad range of tastes/styles, values, behaviors, and problem-solving techniques. It doesn't seem rational to think that simply viewing violent content will increase violence. However, in the subjective experience of the criminal, what is the mental imagery or reference point when they conjure their plans, or lose control of their emotions? What cultural memory is brought to the mind's eye of the violent offender? It could be the case that there is inadvertent messaging, so to speak, across all cultural products and institutions, and it happens to be that within the US, the unfortunate outcome is violent behavior from those struggling through their existence the most. It seems the United States is uniquely poised to suffer from excessive societal violence. Though the findings of this study were not statistically significant, results show that, in general, the direction of effect of movie modeling on societal violence is positively related. In effect, the fundamental contribution of this paper is showing that some measures of violence are going up in the top ten movies every year, while rates of real-world violence are also generally rising.

Conclusion

As society and culture evolve and become more complex, leaders need to reference the current cultural context so as to instill and maintain desirable prosocial beliefs, values and behaviors over time. The current rising trend of (gun) violence cannot be accepted as normal. As a society we must push back on the current lack of political action. The simplest action to take would be to reinstate the Federal Assault Weapons Ban, or something of its equivalence. Unfortunately,

monied interest has the American citizenry hostage on this point. As regards to cultural products modeling of violence, in all fairness, the likely effect of modeled violence in film, if there is an actual effect at all, is probably very small; subtle and nuanced at the least. Though the researcher believes this is a line of questioning worth pursuing and a domain worth understanding, resources and research should be oriented towards other avenues as well, some which are more likely to prevent, or even lower, rates of societal violence quicker. It is the opinion of the researcher, that aiding those struggling in society the most, and helping to preserve human dignity, is a must. The more individuals we can prevent from subjective frustration, shame and powerlessness, the more likely more individuals will be better integrated into society, and less likely to resort to delinquent behaviors. If the citizenry could rally together to influence industry to implement a more discretionary use of violence in movies and media in general, overtime, we could potentially begin to see cultural attitudes shift. Unfortunately, this would require Americans to adopt a total cultural paradigm shift, which is currently highly unlikely.

References

Abbink, J. (2000). Preface: violation and violence as a cultural phenomenon. In G. Aijmer & J. Abbink (Eds.), *Meanings of Violence: A Cross-Cultural Perspective* (pp. xi–xvii). Oxford: Berg.

Aldrich, C. R. (1931). *The Primitive Mind and Modern Civilization*. London: Methuen & Co.

Allport, F. H. (1923). The Croup Fallacy in Relation to Social Science. *American Journal of Sociology, 29*, 53-64.

Altheide, D. L. (2009). Gun laws and fear in Arizona. *Social Science Journal, 46*(3), 570-578.

Anderson, C. A., & Dill, K. E. (2000). Video games and aggressive thoughts, feelings, and behavior in the laboratory and in life. *Journal of personality and social psychology, 78*(4), 772-790.

Arendt, H. (1970). *On Violence*. London: Allen Lane.

Bacciagaluppi, M. (2004). Violence: innate or acquired? A survey and some opinions. *Journal of the American Academy of Psychoanalysis and Dynamic Psychiatry, 32*(3), 469–481.

Bandura, A. (1973). *Aggression: A Social Learning Analysis*: Prentice-Hall.

Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.

Benedict, R. (1931). *The Science of Custom, reprinted in The Making of Modern Man*. New York: Modern Library.

Bennett, T. (1998). Cultural value and the crisis of legitimacy. *The Sociological Review, 46*, 93-118.

Berger, J., & Heath, C. (2007). Where Consumers Diverge from Others: Identity Signaling and Product Domains. *Journal of Consumer Research, 34*(2), 121-134.

Berry, J. W. (1980). Acculturation as Varieties of Adaptation. In A. M. Padilla (Ed.), *Acculturation: Theory, Models and Some New Findings* (pp. 9-25): Westview Press.

Bidney, D. (1944). The Concept of Culture and Some Cultural Fallacies. *American Anthropologist, 46*(2), 263-281.

Boas, F. (1911). *The Mind of Primitive Man*. New York: The Macmillan Company.

Bond, J. W. (2019). An Exploration of the Relationship between Mass Shootings and Video Games. *Journal of Interpersonal Violence, 34*(19), 4051-4072.

Bourdieu, P. (1977). *Outline of a Theory of Practice*. Cambridge: Cambridge University Press.

Bowman, G. (2001). Violence and identity. In B. E. Schmidt & I. W. Schröder (Eds.), *Anthropology of Violence and Conflict* (pp. 25–46). London: Routledge.

Brown, S. C. (2020). Examining the Relationship between Media Consumption and Attitudes towards Gun Violence: A Meta-Analysis. *Communication Research Reports, 37*(2), 91-100.

Bufacchi, V. (2005). Two concepts of violence. *Political Studies Association, 3*, 193–204.

Bushman, B. J., & Anderson, C. A. (2002). Violent Video Games and Hostile Expectations: A Test of the General Aggression Model. *Personality and Social Psychology Bulletin, 28*(12), 1679-1686.

Carlson, J. M., & Carlson, K. S. (2019). Masculinity and gun violence: Male threat in America. *Journal of Gender Studies, 28*(7), 790-805.

Choi, I., Nisbett, R. E., & Norenzayan, A. (1999). Causal attribution across cultures: Variation and universality. *Psychological Bulletin, 125*(1), 47-63.

Clastres, P. (1994). *Archaeology of Violence*. New York: Semiotext.
Cohen, A. (1955). *Deviance and Control*. London: Prentice Hall.
Cohen, L. E., & Felson, M. (1979). Social change and crime rate trends: a routine activity approach. *American Sociological Review, 44*, 588–608.
Collins, R. (1974). Three faces of cruelty: towards a comparative sociology of violence. *Theory and Society, 1*(4), 415–440.
Collins, R. (2008). *Violence: A Micro-sociological Theory*. Princeton, NJ: Princeton University Press.
Collins, R. (2009). Micro and macro causes of violence. *International Journal of Conflict and Violence, 3*(1), 9–22.
Conis, E. M. (2003). Men, masculinity, and firearm ownership. *Western Journal of Nursing Research, 25*(8), 946-962.
Connell, R. W. (1987). *Gender and Power: Society, the Person, and Sexual Politics*. Stanford, CA: Stanford University Press.
Cook, P. J. (1984). The effect of gun availability on burglary rates: a multiple time-series analysis of the impact of gun ownership levels and gun control laws. *Law & Society Review, 18*(4), 681-696.
Cook, P. J., & Ludwig, J. (2006). The Social Costs of Gun Ownership. *Journal of Public Economics, 90*(1-2), 379-391.
Cooney, M. (2003). Privatization of violence. *Criminology, 41*(4), 1337–1406.
Decety, J., Michalska, K. J., Akitsuki, Y., & Lahey, B. B. (2009). Atypical empathic responses in adolescents with aggressive conduct disorder: a functional MRI investigation. *Biological Psychology, 80*(2), 203–211.
DeKeseredy, W. S., & Schwartz, M. D. (2009). *Sexual Violence: Causes, Consequences, and Prevention*: New York University Press.
Dixon, B. (1928). *The Building of Cultures*. New York: Charles Scribner's Sons.
Dollard, J. (1943). Culture, Society, Impulse and Socialization. *American Journal of Sociology, 49*(1), 50-63.
Duggan, M. (2001). More Guns, More Crime. *Journal of Political Economy, 109*(5), 1086-1114.
Duwe, G. (2007). *Mass murder in the United States: A history*: McFarland.
Eagly, A. H., & Chaiken, S. (1993). *The Psychology of Attitudes*: Harcourt Brace Jovanovich.
Elias, N. (1939/1994). *The Civilizing Process (revised ed.)*. Oxford: Blackwell.
Elias, N. (1991). *The society of individuals*. New York: Continuum.
Elias, N. (2000). *The civilizing process revisited: Sociogenetic and psychogenetic investigations*. Oxford: Blackwell.
Ellwood, C. A. (1938). *The Story of Social Philosophy*. New York: Prentice-Hall.
Ember, C., & Ember, M. (1997). *Cultural Anthropology*. London: Pearson.
Englander, E. K. (2007b). *Understanding Violence*. London: Taylor Francis.
Eubank, E. E. (1932). *The Concepts of Sociology*. New York: Prentice-Hall.
Felson, R. B. (1998). *Crime and Everyday Life: Insight and Implications for Society*: Pine Forge Press.
Felson, R. B. (2009). Violence, crime and violent crime. *International Journal of Conflict and Violence, 3*(1), 23–39.

Ferguson, C. J. (2017). Do Angry Birds Make for Angry Children? A Meta-Analysis of Video Game Influences on Children's and Adolescents' Aggression, Mental Health, Prosocial Behavior, and Academic Performance. *Perspectives on Psychological Science, 12*(5), 1-30.

Ferguson, C. J., & Rueda, S. M. (2019). The Hitman Study: Violent Video Game Exposure Effects on Aggressive Behavior, Hostile Feelings, and Depression. *European Psychologist, 24*(1), 44-56.

Fiske, A. P., Kitayama, S., Markus, H. R., & Nisbett, R. E. (1998). The cultural matrix of social psychology. In D. T. Gilbert, F. S. T., & G. Lindzey (Eds.), *Handbook of Social Psychology* (pp. 915-981). Boston: McGraw-Hill.

Fiske, J. (1992). The cultural economy of fandom. . In *The Adoring Audience: Fan Culture and Popular Media* (pp. 30-49).

Fiske, S. T. (1993). Social Cognition and Social Perception. *Annual Review of Psychology, 44*(1), 155-194.

Fox, J. A., & Swatt, M. L. (2009). *Uniform Crime Reports [United States]: Supplementary Homicide Reports With Multiple Imputation, Cumulative Files 1976-2007.*

Freud, S. (1913/1950). *Totem and Taboo*. London: Routledge & Kegan Paul.

Freud, S. (1930/1961). *Civilization and its Discontents*. New York: W.W. Norton.

Fromm, E. (1974). *Anatomy of Human Destructiveness*. New York: Holt, Rinehart & Winston.

Galtung, J. (1969). Violence, peace and peace research. *Journal of Peace Research, 6*(3), 167–191.

Geertz, C. (1973). Thick Description: Toward an Interpretive Theory of Culture. In *The Interpretation of Cultures: Selected Essays* (pp. 3-30). New York: Basic Books.

Gelfand, M. J., & Harrington, J. R. (2014). *The Handbook of Negotiation and Culture*. Stanford, CA Stanford University Press.

Gelfand, M. J., Raver, J. L., Nishii, L., Leslie, L. M., Lun, J., Lim, B. C., & Yamaguchi, S. (2011). Differences between tight and loose cultures: A 33-nation study. *Science, 332*(6033), 1100-1104.

Gentile, D. A., Lynch, P. J., Linder, J. R., & Walsh, D. A. (2004). The Effects of Violent Video Game Habits on Adolescent Hostility, Aggressive Behaviors, and School Performance. *Journal of Adolescence, 27*(1), 5-22.

Gilligan, J. (2000). *Violence: Reflections on our Deadliest Epidemic*. London: Jessica Kingsley.

Gilligan, J. (2004). Shame, guilt and violence. *Social Research, 70*(4), 1149–1180.

Girard, R. (1977). *Violence and the Sacred*. Baltimore, MD: Johns Hopkins University Press.

Glasser, M. (1998). On violence: a preliminary communication. *International Journal of Psycho-Analysis, 79*(5), 887–902.

Gun Violence Archive. (2023). *Gun Violence Archive Database, for 2014 - 2021*.

Habermas, J. (1979). *Communication and the Evolution of Society*. London: Heinemann.

Habermas, J. (1984). *Reason and the Rationalization of Society. Vol. 1: The Theory of Communicative Action*. Boston, MA: Beacon Press.

Hagan, J., & Foster, H. (2003). Violence and Social Orders: A Conceptual Framework for Interpreting Recorded Human History. *Criminology, 41*(4), 695-729.

Hemenway, D. (2004). *Private Guns, Public Health*: University of Michigan Press.

Hirschi, T. (1969). *Causes of Delinquency*. Berkeley, CA: University of California Press.

Hirschi, T., & Gottfredson, M. (2000). In defense of self-control. *Theoretical Criminology, 4*, 55–69.

Hofstede, G. (1980). *Culture's Consequences: International Differences in Work-Related Values*: Sage Publications.

Hong, Y. Y., Morris, M. W., Chiu, C. Y., & Benet-Martinez, V. (2000). Multicultural minds: A dynamic constructivist approach to culture and cognition. *American Psychologist, 55*(7), 709-720.

Huesmann, L. R., & Kirwil, L. (2007). Why Observing Violence Increases the Risk of Violent Behavior by the Observer. In D. G. Singer & J. L. Singer (Eds.), *Handbook of Children and the Media* (pp. 225-234): Sage Publications.

Huesmann, L. R., Moise-Titus, J., Podolski, C. L., & Eron, L. D. (2003). Longitudinal Relations Between Children's Exposure to TV Violence and Their Aggressive and Violent Behavior in Young Adulthood: 1977–1992. *Developmental Psychology, 39*(2), 201-221.

Ivory, J. D., & Kalyanaraman, S. (2007). The Effects of Technological Advancement and Violent Content in Video Games on Players' Feelings of Presence, Involvement, Physiological Arousal, and Aggression. *Journal of Communication, 57*(3), 532-555.

Jackman, M. (2002). Violence in social life'. *Annual Review of Sociology, 28*, 387–415.

Johnson, D. (2016). Exposure to Violent Media: The Effects of Songs with Violent Lyrics in Hip-Hop and Rap Genres. *Journal of Aggression, Maltreatment & Trauma, 25*(6), 607-621.

Katz, J. (1988). *Seductions of Crime: Moral and Sensual Attractions in Doing Evil*. New York: Basic Books.

Kellermann, A. L., & Rivara, F. P. (1992). Silencing the Science on Gun Research. *JAMA, 267*(22), 3078-3081.

Kellermann, A. L., Rivara, F. P., & Rushforth, N. B. (1993). Gun ownership as a risk factor for homicide in the home. *N Engl J Med, 329*(15), 1084-1091.

Kim, H. S., & Markus, H. R. (1999). Deviance or uniqueness, harmony or conformity? A cultural analysis. *Journal of personality and social psychology, 77*(4), 785-800.

Kimmel, M. (1994). Masculinity as Homophobia: Fear, Shame, and Silence in the Construction of Gender Identity. In H. Brod & M. Kaufman (Eds.), *Theorizing Masculinities* (pp. 119-141). Thousand Oaks, CA: Sage Publications.

Kimmel, M. S. (2000). The gendered connection: Guns and male culture. *Journal of Homosexuality, 39* (3-4), 1-24.

Knowles, D. (2022). Violent crime in America.

Kohlberg, L. (1981). *The Philosophy of Moral Development: Moral Stages and the Idea of Justice*. New York Harper & Row.

Kopel, D. B. (2013). The Samurai, the Mountie, and the Cowboy: Should America Adopt the Gun Controls of Other Democracies? *The Atlantic*.

Kroeber, A. L. (1917). The Superorganic. *American Anthropologist, 19*(2), 163-213.

Kroeber, A. L. (1924). Culture, Genuine and Spurious. *American Journal of Sociology, 29*(4), 401-429.

Kroeber, A. L., & Kluckhohn, C. (1952). *Culture: A critical review of concepts and definitions*. Cambridge, MA: Peabody Museum of American Archaeology and Ethnology, Harvard University.

Lankford, A. (2016). Are mass shootings becoming more frequent? New data from the past 50 years. *Violence and victims, 31*(1), 3-11.
Lea, J., & Young, J. (1984). *What Is To Be Done About Law and Order – Crisis in the Eighties*. Harmondsworth: Penguin.
Levi, M., & Maguire, M. (2004). Reducing and preventing organised crime: an evidence- based critique. *Crime, Law and Social Change, 41*, 397–469.
Leyens, J. P., Paladino, P. M., Rodriguez-Torres, R., Vaes, J., Demoulin, S., Rodriguez-Perez, A., & Gaunt, R. (2000). The Emotional Side of Prejudice: The Attribution of Secondary Emotions to Ingroups and Outgroups. *Personality and Social Psychology Review, 4*(2), 186-197.
Linton, R. (1936). *The Study of Man*. New York: D. Appleton-Century Company.
Lorenz, K. (1963). *On Aggression*. London: Methuen.
MacCabe, C. (2001). The power of movies. *Dædalus, 130*(3), 77-93.
Macrotrends. (2023). U.S. GDP 1960-2023. Retrieved from https://www.macrotrends.net/countries/USA/united-states/gdp-gross-domestic-product
Malamuth, N. M., & Check, J. V. (1985). The Effects of Mass Media Exposure on Acceptance of Violence against Women: A Field Experiment. *Journal of Research in Personality, 19*(1), 15-22.
Marett, R. R. (1928). *Man in the Making*. London: Methuen & Co. Ltd.
Markey, P. M., & Markey, C. N. (2010). Vulnerability to Violent Video Games: A Review and Integration of Personality Research. *Review of General Psychology, 14*(2), 82-91.
Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review, 98*(2), 224-253.
McGloin, J. M., & Wilson, D. B. (2019). Media and Mass Shootings: A Meta-Analysis. *Journal of Criminal Justice, 62*, 29-35.
Mead, M. (1937). *Co-operation and Competition among Primitive Peoples*. New York: McGraw-Hill.
Merton, R. (1938). Social structure and anomie. *American Sociological Review, 3*, 672–682.
Messerschmidt, J. W. (1993). *Masculinities and Crime: Critique and Reconceptualization of Theory*. Lanham, MD: Rowman & Littlefield Publishers.
Miller, T. (2001). The globalization of Hollywood. *The Annals of the American Academy of Political and Social Science, 588*(1), 16-33.
Mullin, C. R., & Linz, D. (1995). Desensitization and Resensitization to Violence Against Women: Effects of Exposure to Sexually Violent Films on Judgments of Domestic Violence Victims. *Journal of personality and social psychology, 69*(3), 449-459.
Nisbett, R. E., & Miyamoto, Y. (2005). The influence of culture: Holistic versus analytic perception. *Trends in Cognitive Sciences, 9*(10), 467-473.
Peterson, J., & Densley, J. (2023). *The Violence Project Mass Shooter Database*.
Petty, R. E., & Cacioppo, J. T. (1986). *Communication and Persuasion: Central and Peripheral Routes to Attitude Change*: Springer-Verlag.
(2022). [Television series episode]. Real Time with Bill Maher, *Real Time with Bill Maher*.
Redfield, R. (1940). *Unpublished lectures quoted in Sociology by W. F. Ogburn and M. F. Nimkoff*. Cambridge, Massachusetts: Harvard University Press.

Redfield, R. (1941). *The Folk Culture of Yucatan*. Chicago: University of Chicago Press.
Robb, J. (1997). Violence and gender in early Italy. In D. L. Martin & D. W. Frayer (Eds.), *Violence and Warfare in the Past* (pp. 111–144). Amsterdam: Gordon and Breach.
Rogoff, B. (1990). *Apprenticeship in thinking: Cognitive development in social context*. New York: Oxford University Press.
Rouse, I. (1940). *Prehistory in Haiti*. New Haven: Yale University Press.
RStudio Team. (2022). RStudio: Integrated Development Environment for R. PBC, Boston, MA: RStudio. Retrieved from https://www.rstudio.com/.
Sadler, P., Ethier, N., Gunn, G. R., Duong, D., & Woody, E. (2009). Are we on the same wavelength? Interpersonal complementarity as shared cyclical patterns during interactions. *Journal of personality and social psychology, 97*, 1005–1020.
Sampson, R. J., & Groves, W. B. (1989). Social Disorganization and Theories of Crime and Delinquency: Problems and Prospects. *Criminology, 27*(4), 519-551. doi:10.1111/j.1745-9125.1989.tb01051.x
Sapir, E. (1931). *Language, Race and Culture, published in The Making of Modern Man*. New York: Modern Library.
Savage, J., & Yancey, C. (2008). The Effects of Media Violence Exposure on Criminal Aggression: A Meta-Analysis. *Criminal Justice and Behavior, 35*(6), 772-791.
Scheff, T. J., & Retzinger, S. M. (2001). *Emotions and Violence: Shame and Rage in Destructive Conflicts*. Lexington, MA: Lexington Books.
Schildkraut, J., & Muschert, G. W. (2014). Media Salience and the Framing of Mass Murder in Schools: A Comparison of the Columbine and Newtown Incidents. *Homicide Studies, 18*(1), 23-43.
Shrum, L. J., Wyer, R. S., & O'Guinn, T. C. (1998). *The Psychology of Entertainment Media: Blurring the Lines between Entertainment and Persuasion*: Lawrence Erlbaum Associates.
Singer, J. D., & Small, M. (1972). The Causes of War and the Conditions of Peace. *Journal of Conflict Resolution, 16*(2), 162-180. doi:10.1177/002200277201600203
Small Arms Survey. (2022). *Global Violent Deaths (GVD) Database*.
Spengler, O. (1937). *The Decline of the West (Vol. 1)*. London: George Allen & Unwin Ltd.
Staiger, J. (1992). The ethics of spectatorship. *The Cinema Book, 2*, 120-130.
Stanko, E. A. (2001). Violence. In E. McLaughton & J. Munie (Eds.), *The Sage Dictionary of Criminology*. London: Sage.
Stewart, J., & Strathern, A. (2002). *Violence: Theory and Ethnography*. New York and London: Continuum Publishing for Athlone Press.
Strauss, A. L., & Corbin, J. (1990). *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. Newbury Park, CA: Sage Publications.
Sussman, R. W. (1999). The myth of man the hunter, man the killer and the evolution of human morality *Zygon, 32* (3), 453–471.
Sutherland, E., Cressey, D. R., & Luckenbill, D. (1939/1992). *Principles of Criminology*. Lanham, MD: Rowman Alta Mira.
The Gun Violence Archive. (2020). *2020 Gun Violence Statistics*.

Topalli, V. (2006). The seductive nature of autotelic crime: how neutralization theory serves as boundary condition for understanding hardcore street offending *Sociological Inquiry, 76*(4), 475–501.
Towers, S., Gomez-Lievano, A., Khan, M., Mubayi, A., & Castillo-Chavez, C. (2015). Contagion in mass killings and school shootings. *PLoS One, 10*(7).
Triandis, H. C. (1994). *Culture and Social Behavior*: McGraw-Hill.
Triandis, H. C. (1995). *Individualism and Collectivism*. Boulder, CO: Westview Press.
Turanovic, J. J. (2022). *A Comprehensive Assessment of Deadly Mass Shootings, 1980-2018*.
Turner, V. W. (1969). *The Ritual Process: Structure and Anti-Structure*. Chicago: Aldine Publishing Company.
Tylor, E. B. (1924). *Primitive Culture*. New York: J.P. Putnam's Sons.
United States Department of Health and Human Services, Centers for Disease Control and Prevention, & Control, N. C. f. I. P. a. (2022). *Firearm Injury Surveillance Study, 1993-2020*.
United States Department of Health and Human Services (US DHHS), Centers for Disease Control and Prevention (CDC), & (NCHS), N. C. f. H. S. (2023). *Compressed Mortality File (CMF) on CDC WONDER Online Database for years 1968 - 2016*.
Vigdor, E. R. (2002). Right-to-Carry Concealed Weapons and the Incidence of Crime. *Journal of Legal Studies, 31*(2), S283-S295.
Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Cambridge, MA: Harvard University Press.
Warden, C. J. (1936). *The Emergence of Culture*. New York: McGraw-Hill.
Warner, R. M. (1998). *Spectral analysis of time-series data*. New York: Guilford Press.
Wieviorka, M. (2009). *Violence: A New Approach*. London: Sage.
Wikipedia. (2023a). Federal Assault Weapons Ban. Retrieved from https://en.wikipedia.org/wiki/Federal_Assault_Weapons_Ban
Wikipedia. (2023b). Timeline of United States Military Operations. Retrieved from https://en.wikipedia.org/wiki/Timeline_of_United_States_military_operations
Winkler, A. (2011). *Gunfight: The battle over the right to bear arms in America*: WW Norton & Company.
Winston, S. (1933). *Culture and Human Behavior*. New York: Henry Holt and Company.
Wissler, C. (1929). *Introduction to Social Anthropology*. New York: The Macmillan Company.
Wolfe, T. (1976). 'Pornoviolence'. In T. Wolfe (Ed.), *Mauve Gloves & Madmen* (pp. 164–172). New York: Clutter & Vine Farr, Straus and Giroux.
Zajonc, R. B. (1980). Feeling and Thinking: Preferences Need No Inferences. *American Psychologist, 35*(2), 151-175.
Zimring, F. E., & Hawkins, G. (1997). *Crime Is Not the Problem: Lethal Violence in America*: Oxford University Press.