Determining subgroups that exist among US firearm owners

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Abstract

Objective: To identify and verify classes of firearm owners that exist within the United States and determine the sources that classes deemed credible to discuss firearm safety for suicide prevention.

Methods: The study is composed of two parts. Part 1 (N = 1,018) utilizes a nationally representative sample of firearm owners. Part 2 (N = 1,064) consists of firearm owners from Mississippi, Minnesota, and New Jersey.

Results: Four unique classes were identified in Sample 1: multiple firearms class, single handgun class, few firearms class, and long-gun class. A three-class solution was found for sample 2. Two of the classes from sample 1 replicated: multiple firearms class and single handgun class. Although many of the classes differed in the ranking of credible sources, a combination of The American Foundation for Suicide Prevention, law enforcement officers, and family members, were ranked as credible sources among all classes.

Conclusions: Findings provide evidence of the heterogenous nature of firearm owners and can be utilized to better understand the subgroups of firearm owners. Additionally, the findings from the credible sources analyses can be leveraged to create more effective safe firearm storage messaging which may increase adherence with safe storage suggestions and ultimately reduce suicide rates.

Introduction

Firearms account for 51% of all suicide deaths and are the most lethal method, with an 85-95% fatality rate (CDC, 2020). Given the high lethality and availability of firearms within the US, firearms means safety efforts can reduce suicide rates. Means safety is defined as rendering methods for suicide less lethal or readily available. Outside the US, firearm means safety has been shown to lower rates of suicide. For example, the Israeli Defense Force saw a 40% reduction in young service member's suicide rates when they instituted a policy that did not allow them to take their weapons home on leave (Lubin, et al., 2010). Although firearms do not cause someone to develop thoughts of suicide, they can increase risk for suicide. Risk for suicide increases by 3-5x when a firearm is present in the home, and risk may be even higher when the firearm is stored unsafely (Anglemyer, Horvath, & Rutherford, 2014; Brent, 2001; Khazem, Houtsma, Gratz, Tull, Green, & Anestis, 2015; Miller & Hemenway, 1999). Additionally, those who own a firearm are more likely to develop a plan for suicide with a firearm (Betz, Barber, & Miller, 2011). Furthermore, research has found that secure firearm storage protects against suicide attempts (Grossman et al., 2005), while unsafe storage increases the risk of dying by suicide (Dempsey et al., 2019).

Messaging on firearm storage

Although research has found that unsecure firearm storage increases risk for suicide, many firearm owners do not engage in secure storage. One reason for their reluctancy may be the message is not coming from a source they perceive as credible. In order to determine ways to increase compliance with secure storage, research has examined both the message and the messenger (Pallin et al., 2019; Crifasi et al., 2018; Anestis, Bond, Bryan, & Bryan, 2021). Crifasi and colleagues (2018) found law enforcement, hunting or outdoor organizations, and

active duty military to be the most preferred sources to discuss secure storage, while celebrities and physicians were the least preferred sources; suggesting that those who are commonly tasked with engaging in conversations about firearm safety for suicide prevention (e.g., physicians) are not viewed as credible by firearm owners. Although this study yielded informative results, it treated firearm owners as a homogenous group and did not explore individual differences. Anestis and colleagues (2021) began to address this gap by examining the differences in source preference by race and gender and found law enforcement, military veterans, and current military personnel to be the top-rated sources among the total sample and the subsample of those who identify as White. However, firearm owners who identified as Black rated law enforcement, family members, and current military personnel to be the top three credible sources. Although Black firearm owners rated law enforcement as the most credible source, the mean ranking of law enforcement was significantly lower among Black firearm owners relative to White firearm owners (Anestis, Bond, Byran, & Bryan, 2021). Although the study by Anestis and colleagues (2021) helped strengthen the literature on credible sources, the study examined the impact of demographic variables (e.g., race) in isolation, failing to examine how multiple factors may converge to effect messenger preference. Findings suggest that a one-size fits all approach to safe storage messaging is likely ineffective and may be a reason for the lack of engagement.

Treating firearm owners as a heterogenous group may allow safe storage messaging to be better received. However, there is a limited understanding of the subgroups of US firearm owners. One study conducted a latent class analysis (LCA) and found that a five-class solution distinguished firearm owners from one another. These classes differed on multiple variables, but some of the most notable were number of firearms owned, type of firearms owned, reason for ownership, and storage habits (Schleimer et al., 2020). Additionally, Bryan and colleagues

(2020) expanded upon this research by using a latent class analytic approach and reporting three unique subgroups of US firearm owners. Their classes differed in multiple ways, including reason for ownership, type of firearms owned, and number of firearms owned. Given these findings, reason for ownership, number of firearms, and type of firearms appear to be important variables for distinguishing subgroups firearm owners from one another and thus support the inclusion of such variables in the present model. An additional example of an LCA that helped identify subgroups of firearm owners is Salhi and colleagues (2019). which found unique classes of firearm owners who differed on their beliefs of firearm-related suicide risk and storage habits (Salhi, Azrael, & Miller, 2019).

Although previous studies have found demographic factors and intrapersonal variables influence suicide risk, these have not been examined in LCA models. The present study will address this gap by including several demographic (gender, race, and rurality) and intrapersonal (perceived threat and suicidal ideation) variables into the model. Additionally, this study extends upon previous research by determining if the classes we find replicate in a second sample; and will examine if the classes differ in terms of who they perceive as credible to discuss secure firearm storage for suicide prevention. Results will allow for safe firearm storage messaging to be customized to different subgroups of firearm owners and use the messengers that each subgroup prefers, which may increase adherence with safe storage recommendations. As described below, each of the variables included in the present study has been found to differentiate firearm owners from one another in previous research.

Variables that may differentiate subgroups of firearm owners

Previous research indicates that race may differentiate firearm owners from one another. Some studies have found that race does not impact firearm ownership (e.g. Haught, Grossman, &

Connel, 1995), while others found that those who identified as White were more likely to own firearms (e.g. Farah, Simon, & Kellermam, 1999). Even though the research on race and ownership is inconclusive, there is evidence that subgroups of firearm owners may differ by race. Additionally, and notably, firearm suicide rates among men who identified as Black increased from 5.52 per 100,000 in 2000 to 6.22 per 100,000 in 2018 (CDC, 2020). Given the rise in suicide by firearm among men who identify as Black, an understanding of the impact of race on firearm variables is essential to prevent firearm suicides.

Recent research has examined the relationship between perceived threats and firearm ownership, acquisition, and storage. Bryan and colleagues (2020) found that, among firearm owners who own firearms for protection, threat expectancies were higher among firearm owners who planned to acquire more firearms in the next year compared to non-firearm owners and those who owned for reasons other than protection; highlighting that those who own firearms for protection represent a unique subgroup of firearm owners. Additionally, research found a relationship between fear of crime and owning a firearm for protection (Warner & Thrash, 2019), suggesting perceptions of safety in the immediate environment may influence the thought process involved in the decision to acquire firearms. Another study found that higher fear among non-gun owners leads to purchasing a firearm (Hauser & Kleck, 2012), highlighting that fear more broadly may be a driving force behind purchasing a firearm. The research in this area could be further strengthened by understanding how threat perceptions align with other intrapersonal factors (e.g., rurality) in subgroups of firearm owners.

Lastly, a history of suicidal ideation has been shown to differentiate firearm owners from one another. For example, military service members who reported lifetime suicidal ideation were significantly more likely to store their firearms unsafely than were those without lifetime

ideation (Anestis et al., 2020). Another factor found to be associated with suicidal thoughts is reason for ownership; specifically, those who own a firearm for protection have been shown to report higher rates of suicide-related behavior (Bryan, Bryan, & Anestis, 2020). Generally, firearm ownership is not associated with suicidal thoughts. However, understanding the differences in firearm owners' suicidal thoughts may be important for better understanding the differences in how firearm owners think about and interact with their firearms.

The present study

The present study fills an important gap by determining subgroups of firearm owners that exist within the US. Results from this study will provide evidence of the heterogenous nature of firearm owners and can help increase the effectiveness of safe firearm storage messaging for suicide prevention.

Methods

Both samples were acquired through the use of quota sampling. Although it is not without its limitations, quota sampling allows for a more representative sample than is typically acquired through other methods (e.g., social media recruitment). Furthermore, the cost of probability-based samples can be prohibitive and, as such, the pursuit of that approach to sampling must at times be balanced with financial feasibility.

Participants

National survey: A subset of firearm owning (n = 1,018) participants from a large online survey (N = 3,500) seeking to assess firearm perceptions within the US was used. Data were collected via Qualtrics Panels between late June and early July 2020 and quota sampling was utilized to ensure participants matched the 2010 US Census for age, sex, race, income, and education level.

State survey: A sample of adult US firearm owners (N = 1,666) from New Jersey (n= 607), Mississippi (n= 535), and Minnesota (n= 524) were recruited through Qualtrics Panels between January and June 2021 to participate in an online survey that sought to better understand characteristics of firearm owners from the three states. Quota sampling was again used to match participants to statewide 2010 Census demographics; however, within Minnesota participants were oversampled from ZIP codes within the Twin Cities (54.6%) in order to help center the data collection effort on the death of George Floyd. New Jersey and Mississippi were selected because they differ demographically, geographically, and in terms of firearm ownership from one another and from Minnesota, which allow for a diverse sample.

Procedures

All studies received necessary Institutional Review Board approval, and consent was obtained from all participants. Members of Qualtrics Panels were recruited by Qualtrics to participate. Participants were compensated at the price they agreed upon individually with Qualtrics. Participants who are included in the Qualtrics panels are recruited from a variety of sources including social media, list-serves, and permission-based networks. Participants are verified by third party measures and other forms of verification such as phone calls. The overall response rate in the National sample was 57%. The overall response rate in the State survey was 54%. Three quality assurance items were included (e.g., have you ever used a computer?), and participants who responded incorrectly to two of the items were removed from the survey.

Measures

A majority of the measures across samples were the same. However, only participants in Part 2 ranked what sources they wanted to hear from regarding safe firearm storage specifically for suicide prevention. Demographic variables and current firearm storage variables were

assessed using self-report questions created by the Suicide and Emotion Dysregulation Laboratory.

Perceived threat was assessed using the Negative Cognitions About the World subscale of the Posttraumatic Cognitions Inventory (PTCI; Foa & Ehlers, 1999). Participants rated how much they agreed with each statement on a seven-point Likert scale ranging from "totally disagree" to "totally agree." The PTCI is a continuous measure; however, in order for it to be included in the LCA it was treated as categorical. To do so, the mean score for the sample was determined and participants were coded in the "low" group if their score fell one standard deviation or more below the mean. Participants were coded in the "high" group if their score fell one standard deviation or more above the mean. Participants who fell within 1 standard deviation below and 1 standard deviation above the mean were coded as the "moderate" group.

Lifetime history of suicidal thoughts was assessed with a self-report version of the Self-Injurious Thoughts and Behaviors Interview- Revised (SITBI; Fox et al., 2020). The SITBI asks about eight different types of suicidal thoughts throughout one's life. Endorsement of any of the eight items was coded as experiencing lifetime ideation.

Participants self-ranked from most preferred to least preferred who they perceive as credible sources to speak about firearm safety for suicide prevention. The list was generated by the research team based on those used in previous studies (Crifai et al., 2018; Anestis, Bond, Bryan, & Bryan, 2020), and the list of messengers was randomized.

Data Analysis

Part 1: A LCA approach controlling for gender and residential location was utilized in order to determine the different classes of firearm owners that exist within the data set. A series of LCAs was run to determine the number of classes that had the optimal fit. Fit was evaluated

based on fit statistics. Specifically, fit was examined based on the lowest Aikike Information Criterion (AIC) and Bayesian Information Criterion (BIC), as well as by examining the Bootstrapped Lo-Mendel-Ruben and significance value (Nylund-Gibson & Choi, 2018; Geiser, 2021); lastly, the percent breakdown of each class and class interpretability was used to determine which number of classes has the best fit.

Part 2: A LCA approach controlling for gender and residential location was utilized in order to verify classes of firearm owners. The model found, one class less than the model, and one class more than the model from in Part 1 was run and the classes were compared to the classes found in Part 1. Additionally, fit was evaluated the same way as in Part 1. The LCA was conducted in MPlus. Next, exploratory analyses determined if there were meaningful differences in the rank order of credible sources to discuss firearm secure storage for suicide prevention between the different classes of firearm owners.

Results

National sample

It was determined that a 4-class solution fit the data best (see Table 1). Class 1 was the largest class (33.3%), followed by class 4 (29.8%), class 3 (27.30%), and class 2 (9.52%); and as can be seen in Table 2, the classes differed on several indicator variables.

Class 1 (few firearms class) was comprised of individuals who owned shotguns, rifles, and handguns, owned 2-4 firearms. Class 2 (long-gun class) owned one firearm that was wither a shotgun or a rifle; this class did not own handguns. Class 3 (multiple firearms class) owned shotguns, rifles, and handguns, and owned 5 or more firearms. Lastly, class 4 (single handgun class) only owned one firearm, which was a handgun.

Class 1 was more likely to use two or more locking devices compared to all the other classes. Class 2 was more likely to store their firearms unloaded compared to all other classes. Class 4 was more likely to store their firearms loaded compared to classes 1 and 2. All classes reported owning for protection at home.

Class 2 was less likely to be from a racial or ethnic minority background compared to all other classes. Individuals in class 4 were more likely to identify as a Black than those in any other class.

Class 1 was less likely to experience lifetime suicidal ideation than all other classes. Class 2 , was less likely than classes 3 and 4 to experience lifetime suicidal ideation and had the largest percentage of participants scoring in the high category of the PCTI, compared to all other classes. Class 3 was more likely to experience lifetime suicidal ideation, store their firearms loaded, and had the second largest percentage of participants scoring in the high category of the PCTI. Class 4 had higher rates of lifetime suicidal ideation, reported owning for protection at higher rates, and were more likely to store firearms loaded compared to classes 1 and 2.

State sample

Based on the findings from Sample 1 and fit statistics, four latent class models were conducted: a 2-class solution, 3-class solution, 4-class, and 5- class solution. Unlike Sample 1, it was determined that a 3-class solution fit Sample 2 best (see Table 1). Class 1 was the largest class (38.13%) followed by class 2 (34.06%), and class 3 (27.82%). As can be seen in Table 3, the classes differed on a number of indicators. Two of the classes found in Sample 1 were replicated in Sample 2; however, there were some notable differences between these classes from Sample 1 and Sample 2.

Class 1 (a replication of the multiple firearms class from Sample 1) owned all types of firearms and owned 5 or more firearms. Class 2 (a replication of the single handgun class from Sample 1) owned one handgun. Class 3 was comprised of individuals who owned a mixture of types and numbers of firearms.

Class 2 was more likely to store their firearms unloaded compared to the other classes. Class 1 reported owning primarily for competition and hunting, while classes 2 and 3 reporting owning primarily for protection at home.

Classes 1 and 3 were predominately White; and members of class 2 were more likely to identify as a Black than in other classes

Class 1 had the second highest rates of lifetime suicidal ideation compared to all other classes. Class 3 had the highest rates of lifetime suicidal ideation and had the largest percentage of participants scoring in the high range on the PCTI.

Table 4 includes the mean ranking for all sources. The single handgun class ranked family (7.63), The American Foundation for Suicide Prevention (7.63), and law enforcement officers (7.88) as the most credible sources to discuss firearm safety for suicide prevention; and ranked gun show managers or coordinators (11.09), hunting and outdoor magazines (11.03), and celebrities (12.29) as the least credible sources.

The multiple firearms class ranked law enforcement officers (7.15), The American Foundation for Suicide Prevention (7.22), and family (7.23) as the most credible sources to discuss firearm safety for suicide prevention; and ranked hunting and outdoor magazines (11.21), gun show managers or coordinators (11.66), and celebrities (12.95) as the least credible sources.

The mixed firearms class ranked family (7.15), The American Foundation for Suicide Prevention (7.48), and law enforcement officers (7.65) as the most credible sources to discuss

firearm safety for suicide prevention; and ranked hunting and outdoor magazines (10.87), gun show managers or coordinators (11.10), and celebrities (12.40) as the least credible sources.

Discussion

The present study sought to determine and verify unique classes of firearm owners that exist within the US and to understand who each class deems credible to discuss firearm safety for suicide prevention. The findings from this study support that firearm owners are a heterogenous group, and the replication of classes across both samples highlights that there is a relative degree of commonality to the classes that were found. The results from this study can be used to better understand the subgroups of firearm owners that exist and to create more personalized and effective safe storage messaging.

Sample Comparisons

In both samples, two classes were replicated, suggesting that the single handgun and multiple firearms classes are stable nationally and when examining three states collectively, except for a few notable differences between the classes.

The handgun class represents a unique and often overlooked subgroup of American firearm owners. This class owned a single handgun, owned for protection, and although predominantly White, identified as Black more than any other class. This class also reported high rates of suicidal ideation and, given the type of firearms owned this group, may be at increased risk for dying by suicide with a firearm. Previous research has found handgun ownership to be associated with dying by self-inflicted gunshot wound compared to another method (Bond & Anestis, 2021). Familiarity and access to handguns may result in this group being at increased risk for utilizing a firearm in their suicide attempt compared to classes that do not own a handgun. Additionally, this class is comprised of the largest percentage of Black Americans, and

although firearm suicide deaths are commonly discussed as occurring among White men, as mentioned above firearm suicide rates among Black men have increased in recent years, providing further evidence that this group may be at increased risk for using their firearm if they attempt suicide.

The multiple firearms class was also replicated in both samples. This group is what is commonly thought of as the "typical" American firearm owner, identifying primarily as White and owning multiple firearms. The high number of firearms owned and high rates of suicidal ideation among this class are concerning; Additionally, in Sample 2, this class had the second largest percentage of participants scoring in the high range on threat sensitivity, suggesting that they have a greater expectation of threat than other classes. Previous research has found threat expectancies to be associated with an increased risk for past-month suicidal behavior (Bryan, Bryan, & Anestis, 2020); providing further evidence that this class may be at heightened suicide risk. On a positive note, over 70% of this class across all samples endorsed using at least one locking device. This finding suggests that they may already be engaging in some safe storage habits and thus may be open to discussing safe firearm storage for suicide prevention.

The few firearms class did not replicate in the second sample . This class appears to be similar to the multiple firearms class in terms of race, reason for ownership, and type of firearms owned. The primary difference between this class and the multiple firearms class is that they owned 2-4 firearms as opposed to 5+. Additionally, this class appeared to be similar to the long-gun class. The primary differences between these groups was that this class also owned handguns. The long-gun class, was also not replicated in both samples. This class only owned one firearm and they may have chosen a firearm that they view as more versatile and which can also be used for hunting or other recreational purposes and to protect themselves from threats.

The mixed firearms class was only present in Sample 2. Participants in this class owned a mix of type and number of firearms, resembling a combination of the few firearms and long-guns classes. It may be that when examining a national sample, firearm owners are separated into either the few firearm or long-gun class, but when examining a geographically limited sample these individuals are combined into one class, the mixed firearms class.

Comparison to Previous Research

As mentioned above, two previous LCAs laid the foundation for the present study (Schleimer et al., 2019; Bryan, Bryan, & Anestis, 2020). The present study replicated three of the five classes found among California firearm owners (Schleimer et al., 2019). Specifically, in the study by Schleimer and colleagues (2019), class 1 owned a mixture of handguns and long-guns and owned 5+ firearms, making it comparable to the multiple firearms class in the present study; class 2 owned 2-4 firearms and owned both long-guns and handguns, thereby resembling the few firearms class; and class 3 owned one handgun and is similar to the single handgun class. Additionally, the present study replicated all three classes found in the study by Bryan and colleagues (2020). Specifically, the low volume class was comprised of individuals who owned one handgun and is comparable to the single firearm class; the moderate volume class owned 2-3 firearms and is like the few firearms class; and the high-volume class owned 5+ firearms and resembles the multiple firearms class.

In the national sample from Bryan and colleagues and in the present study's national sample, the multiple firearms, single handgun, and few firearms classes were identified and the replication of classes across both samples highlights that there is a relative degree of commonality to the classes that were found. In the state sample from Schleimer and colleagues and in the present state samples, the multiple firearms, few firearms, and single handgun classes

were replicated, suggesting that these classes are consistent both in national samples and when examining four states (Mississippi, Minnesota, New Jersey, and California) that differ demographically, politically, and in terms of firearm ownership.

Creating national and state level programs and safe storage messaging campaigns that appeal to the different groups of firearm owners and address their specific needs will help increase the effectiveness of the messages. Another way to enhance the credibility of the message of firearm safety for suicide prevention is by using sources firearm owners deem credible.

Credible Sources

The rankings in Sample 2 for sources deemed credible to discuss firearm safety for suicide prevention were inconsistent with previous research. Previous studies found law enforcement officers, military members, and veterans to be some of the most credible sources to discuss firearm safety (Crifasi et al., 2018; Anestis, Bond, Bryan, & Bryan, 2021). In the present study, all classes ranked a combination of family, law enforcement officers, and the American Foundation for Suicide Prevention (AFSP) as the three most credible sources to discuss firearm safety for suicide prevention.

The high ranking of law enforcement and veterans as a credible source is consistent with previous studies, while the rankings of family, AFSP, and physicians were more surprising. However, research suggests that a majority of patients in primary care (83%) and mental health settings (92%) answer standard questions about firearms on a mental health questionnaire (Richards et al., 2021); suggesting the majority of patients are open to answering questions regarding firearm ownership. Additionally, the high ranking of physicians may be due to the fact that in certain regions, patients assume their physicians own firearms, which leads them to view

their providers as credible to discuss safe firearm storage for suicide prevention. This study is the first to include AFSP in the list of sources and it may be that firearm owners see them as credible to discuss suicide prevention as opposed to a firearm safety organization (e.g., gun violence research centers) given they specialize in suicide prevention. However, AFSP was ranked as slightly more credible than the American Association of Suicidology (AAS), another suicide prevention group. The reasons behind the differences in ranking is unknown. It may be as simple as the names or perceptions of the organizations. Those outside of academia may be confused about what "suicidology" entails or may perceive AAS as an academic organization and AFSP as a community organization. Future research should seek to determine why firearm owners deem them trustworthy to discuss firearm safety for suicide prevention in order to help similar organizations (e.g., Gun Violence Research Centers) gain credibility among firearm owners.

Another potential explanation for the differences between these findings and those from prior research maybe based on methodology. To our knowledge, this was the first study to randomize the order in which the sources appeared in the actual survey item. Prior studies presented the list of sources in the same order each time, with physicians being listed last. The fact that physicians did not always appear last may have led to participants ranking physicians higher than in previous studies.

Law enforcement officers were continuously ranked as a highly credible source to discuss firearm safety for suicide prevention. This is consistent with previous research (Crifasi et al., 2018; Anestis, Bond, Bryan & Bryan, 2021); and further validates that law enforcement officers are perceived as credible by almost all members of the firearm owning community. Utilizing law enforcement officers for safe storage campaigns will ensure that the message resonates with the maximum amount of firearm owners.

The ranking of family members as a credible source may speak to the gun culture of the states in the survey. For example, Mississippi and Minnesota have a high rate of firearm ownership and therefore it is likely these individuals have family members who own firearms. The culture of owning firearms may lead to people viewing their family as trustworthy sources to discuss firearm safety for suicide prevention.

A combination of gun show managers or coordinators, hunting and outdoor magazines, and celebrities were ranked the three least credible sources. Regardless of the class of firearm owners being targeted with the message, these sources are not perceived as credible and safe storage campaigns should be cautious when selecting them as messengers. Interestingly, many of the sources that were ranked as less credible were part of the firearm community (e.g., firearm dealers, NSSF, NRA). These finding highlights that being part of the firearm community is not enough to make a source credible. However, some of these sources have access to a large number of firearm owners. Creative marketing strategies, such as pairing them with a more credible messenger may enhance their credibility and ensure that the message of firearm safety is disseminated through multiple platforms to reach the maximum amount of people. For example, a gun show manager or coordinator can work with AFSP to disseminate information and handouts at a gun show. Finding ways to pair credible messengers with those not perceived as trustworthy but interact with many firearm owners, may help increase the reach and credibility of the message. Future research should empirically examine what sources are more credible in delivering the message of safe firearm storage for suicide prevention.

Limitations and Future Directions

Although informative, the present study is not without its limitations. The PCTI was converted from a continuous to a categorical measure; although necessary to include this variable

into the LCA model, this results in a loss of information. Additionally, storage practices were coded as categorical based on how many different safe storage devices were used on at least one firearm. This coding system favors those with more than one firearm and does not provide information on what specific safe storage mechanisms are being used. Further, we did not assess for storage habits of each firearm, which limits our understanding of how often a firearm owner uses certain safe storage devices. Future research should determine ways to assess firearm storage habits for each firearm owned. Another limitation was that the sample was matched to the 2010 US census, not the 2019 American Community Survey 5-Year estimates. Other methods may have provided more accurate estimates of the prevalence of the demographic factors used in the quotas. Lastly, although quota sampling allows for a more representative sample than other methodologies commonly used in research (e.g., social media recruitment) it is not without its limitations. Future research on subgroups of firearm owners should employ probability-based sampling to increase the representativeness of the sample and to allow for population estimates.

This study provides an understanding of the unique subgroups of firearm owners that exist within the US and who they deem credible to discuss safe firearm storage for suicide prevention. Future research should seek to better understand the classes of firearm owners, especially the single handgun and multiple firearms classes given their potentially high risk for suicide, to create firearm means safety strategies that address their specific needs. Findings from this study should be used to increase the effectiveness of firearm safety messaging, which may result in greater adherence with recommendations and ultimately reduce suicide rates.

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Table 1. Sample Characteristics

	Sample 1	Sample 2
Characteristic	N(%)	N(%)
Age		
M(SD)	45.25 (16.531)	46.71 (17.196)
Range	18 – 91 years old	18 – 85 years old
Gender		
Men	711 (62.8%)	611 (57.0%)
Women	414 (36.5	460 (43.0%)
Transgender	6 (0.5)	0 (0.0%)
Other	2 (0.2)	0 (0.0%)
Race		
American Indian/Alaskan Native	39 (3.4%)	22 (2.1%)
Asian	60 (5.3%)	31 (2.9%)
Black/African American	151 (71.6%)	149 (13.9%)
Native Hawaiian or Other Pacific Islander	9 (0.8%)	9 (0.8%)
White	811 (71.6)	848 (79.2%)
Biracial	19 (1.7%)	0 (0.0%)
Other	44 (3.9%)	12 (1.2%)
Education		
Less than high school	12 (1.1%)	14 (1.3%)
High school degree	369 (32.5%)	301 (28.1%)
Associate's degree	269 (23.7%)	240 (22.4%)
Bachelor's degree	237 (20.9%)	237 (22.1%)
Master's degree	201 (17.7%)	228 (21.3%)
Professional degree	45 (4.0%)	51 (4.8%)

Table 2. Fit Statistics for Latent Class Analyses

	BIC	AIC	Log-likelihood	Entropy	Lo-Mendel-Ruben	*p*	Bootstrap LMR	*p*
Sample 1								
2-Class	16095.893	15844.687	-7871.344	.0848	-8425.604	<.001	-8425.604	<.001
3-Class	15900.491	15521.220	-7683.610	0.962	-7871.344	<.001	-7871.344	<.001
4-Class	**15873.881**	**15366.544**	**-7580.272**	**0.980**	**-7683.610**	**<.001**	**-7683.610**	**<.001**
5-Class*	--	--	--	--	--	--	--	--
6-Class*	--	--	--	--	--	--	--	--
Sample 2								
2-Class	29240.772	28946.001	-14418.001	0.762	-15160.598	1.000	-15160.598	<.001
3-Class	**28916.529**	**28477.052**	**-14156.526**	**0.817**	**-14418.001**	**<.001**	**-14418.001**	**<.001**
4-Class*	--	--	--	--	--	--	--	--
5-Class*	--	--	--	--	--	--	--	--

Note. The bolded model was deemed to be the best fitting.
Note. * indicates the model did not replicate.

Table 3. Probabilities for Class Membership on Indicator Variables for Sample 1

Variable	Class 1 "Few Firearms" (n = 339)	Class 2 "Long-Gun" (n = 97)	Class 3 "Multiple Firearms" (n = 278)	Class 4 "Single Handgun" (n = 304)
Race				
White	0.75	0.81	0.83	0.62
Black	0.12	0.07	0.05	0.23
American Indian	0.03	0.01	0.03	0.04
Alaskan Native	0.04	0.04	0.03	0.07
Asian	<0.01	0.02	0.00	<0.01
Native Hawaiian	0.03	0.04	0.04	0.02
Other	0.02	0.00	0.02	0.02
Reasons for firearm ownership				
Received as gift or inheritance	0.22	0.14	0.16	0.18
Personal safety or protection away from home	0.10	0.14	0.13	0.12
Personal safety or protection at home	0.36	0.40	0.39	0.44
Competition	0.03	0.02	0.03	0.04
Hunting	0.18	0.13	0.21	0.16
Other recreational reasons	0.05	0.10	0.04	0.05
To express my freedom	0.02	0.04	0.02	0.01
Other	0.03	0.03	0.02	0.01
Handgun				
No	0.14	1.00	0.03	0.00
Yes	0.86	0.00	0.97	1.00
Shotgun				
No	0.28%	0.39	0.05	1.00
Yes	0.72%	0.61	0.95	0.00
Rifle				
No	0.31%	0.60	0.03	1.00
Yes	0.69%	0.40	0.97	0.00
Number of Firearms				
One	0.00%	1.00	0.00	1.00
Two-Four	1.00%	0.00	0.00	1.00
Five or More	0.00%	0.00	1.00	0.00
Loaded				
Any firearm loaded	0.45%	0.18	0.67	0.52
All firearms unloaded	0.55%	0.82	0.33	0.48
Locking Devices				
None	0.19%	0.29	0.09	0.18
One	0.48%	0.56	0.53	0.61
Two or More	0.33%	0.16	0.38	0.21
Lifetime Ideation				
No	0.66%	0.64	0.52	0.55
Yes	0.34%	0.36	0.48	0.45
PCTI				
Low	0.19%	0.25	0.19	0.18
Middle	0.62%	0.50	0.59	0.63
High	0.19%	0.25	0.22	0.19

*Table 3 includes the probability of endorsing an item given latent class membership.

Table 4. Probabilities for Class Membership on Indicator Variables for Sample 2

Variable	Class 1 "Multiple Firearms" (n = 599)	Class 2 "Single Handgun" (n = 535)	Class 3 "Mixed Firearms" (n = 437)
Race			
White	0.86	0.73	0.69
Black	0.07	0.22	0.17
American Indian	0.02	<0.01	0.02
Alaskan Native	0.01	0.03	0.08
Asian	0.01	0.00	<0.01
Native Hawaiian	0.01	0.00	0.02
Other	0.02	0.02	0.02
Reasons for firearm ownership			
Received as gift or inheritance	0.06	<0.01	0.12
Personal safety or protection away from home	0.03	0.12	0.03
Personal safety or protection at home	0.12	0.60	0.34
Competition	0.28	0.08	0.19
Hunting	0.31	0.02	0.15
Other recreational reasons	0.17	0.06	0.14
To express my freedom	0.01	0.08	0.01
Other	0.02	0.04	0.02
Handgun			
No	0.14	0.24	0.22
Yes	0.86	0.76	0.78
Shotgun			
No	0.07	0.77	0.48
Yes	0.93	0.23	0.52
Rifle			
No	0.03	0.80	0.52
Yes	0.96	0.20	0.48
Number of Firearms			
One	0.00	0.57	0.30
Two-Four	0.34	0.36	0.38
Five or More	0.66	0.07	0.32
Loaded			
Any firearm loaded	0.46	0.36	0.37
All firearms unloaded	0.54	0.64	0.63
Locking Devices			
None	0.15	0.45	0.33
One	0.47	0.37	0.41
Two or More	0.38	0.18	0.26
Lifetime Ideation			
No	0.65	0.65	0.54
Yes	0.35	0.35	0.46
PCTI			

Low	0.17	0.13	0.15
Middle	0.64	0.70	0.63
High	0.19	0.17	0.22

*Table 4 includes the probability of endorsing an item given latent class membership.

Table 5. Differences in Mean Ranking and Rank Order for Credible Sources in Sample 2

	Multiple Firearms	Single Handgun	Mixed Firearms
	M (rank)	M (rank)	M (rank)
Law Enforcement	7.15 (1)	7.88 (3)	7.65 (3)
Hunting or Outdoor Organizations	10.09 (11)	10.38 (14)	10.32 (12)
Military Veterans	8.52 (7)	8.69 (6)	8.45 (5)
Current Military Personnel	8.76 (8)	8.85 (8)	9.13 (9)
National Rifle Association	9.86 (10)	9.44 (10)	10.35 (13)
Firearm Manufacturers	10.34 (13)	10.21 (11)	10.48 (14)
Firearm Dealers	10.63 (14)	10.37 (12)	10.12 (10)
Family Members	7.23 (3)	7.53 (1)	7.15 (1)
Hunting or Outdoor Magazines	11.21 (16)	11.03 (16)	10.87 (16)
Casual Acquaintances	10.86 (15)	10.66 (15)	10.64 (15)
Friends or Coworkers	8.40 (6)	8.66 (5)	8.68 (7)
Gun Show Managers or Coordinators	11.66 (17)	11.09 (17)	11.10 (17)
Physicians or Medical Professionals	8.04 (4)	8.10 (4)	8.32 (4)
Celebrities	12.95 (18)	12.29 (18)	12.40 (18)
Gun Violence Research Centers	9.48 (9)	9.10 (9)	9.10 (8)
The National Shooting Sports Foundation	10.24 (12)	10.38 (14)	10.24 (11)
The American Foundation for Suicide Prevention	7.22 (2)	7.63 (2)	7.48 (2)
The American Association of Suicidology	8.35 (5)	8.71 (7)	8.51 (6)

*Table 4 includes the mean ranking and rank order for all sources broken down by the classes found in Sample 2.