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# Identity, experience, and threat: Assessing key correlates of firearm ownership and related behaviors in a representative sample of five US States

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ABSTRACT

The purpose of this study was to examine psychosocial, experiential, and demographic correlates of firearm ownership, carrying, and storage methods. We used a representative survey of 3,510 people living in five US states (Colorado, Minnesota, Mississippi, New Jersey, and Texas) conducted in 2022. Individuals provided information on past experiences with firearms, perceptions of threat and neighborhood safety, discrimination, and tolerance of uncertainty alongside demographic items. The analysis was conducted in November 2022. Past experiences with firearms and prior victimization are associated with increased firearm ownership and carrying practices. Threat sensitivity is associated with owning more guns while poorer perceptions of neighborhood safety correspond with owning fewer guns but greater risk for unsafe storage practices like storing a loaded gun in a closet or drawer. Intolerance of uncertainty is associated with owning fewer guns and lower risk for carrying outside of the home but greater risk for unsafe storage. Prior experience of discrimination is associated with risk for carrying firearms outside of the home. Demographic characteristics related to sex, rurality, military service, and political conservatism predict risky firearm-related behaviors related to firearm ownership, carrying frequency, and unsecure storage. Taken together, we find firearm ownership and risky firearm behaviors (e.g. carrying, unsafe storage) are more prominent among groups such as politically conservative males living in rural areas while also being influenced by threatening experiences, uncertainty, and perceptions of safety.

Firearm-related injuries and deaths are a leading public health issue in the United States (US). States and households with higher rates of firearm ownership experience greater incidence of injury and death by firearms (Laqueur et al., 2019; Miller et al., 2002). Nevertheless, firearm purchases have increased dramatically in recent years. During the COVID-19 pandemic, an estimated 2.1 million more firearms were purchased than in prior years (Schleimer et al., 2020; Miller et al., 2022). In general, firearm owners in the US have historically been middle-aged or older White men who reside in suburban and/or rural areas (Berrigan et al., 2019; Carter et al., 2022; Mauri et al., 2019; Miller et al., 2017). However, the majority of people who purchased a firearm for the first time during the pandemic were women and Black or Hispanic Americans (Miller et al., 2022). Given significant demographic shifts in firearm ownership and an unprecedented number of firearms in American households, this study examines the psychosocial and experiential factors associated with a suite of firearm-related behaviors including ownership, carrying, and storage practices.

Firearm ownership and related behaviors are associated with prior exposure to firearms in childhood, past violent victimization, and experiences of fear, uncertainty, and safety. Across multiple studies, between 50 and 75% of firearm owning US adults reported growing up with a firearm in the home (Logan and Lynch, 2021; Kravitz-Wirtz et al., 2020). The main reason for firearm ownership in the US is now protection against others and the majority of firearm owners believe a firearm makes the home safer (Mauri et al., 2019; Warner and Thrash, 2020; Horn et al., 2021). People often purchase firearms for protection in response to perceptions of local crime rates and prior violent victimization experiences (Turner et al., 2016; Hauser and Kleck, 2013;

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Kleck et al., 2011; Pelletier et al., 2022; Schleimer et al., 2020). Yet protective firearm ownership is associated with unsafe firearm storage such as storing a firearm unlocked and loaded and more frequent carrying outside of the home (Mauri et al., 2019; Warner and Thrash, 2020; Carter et al., 2020).

Firearm owners who perceive a persistent need to protect against danger may engage in riskier firearm behaviors to ensure firearms are readily accessible in and outside of the home (Carter et al., 2020; Brunson et al., 2022; Buttrick, 2020). Heightened perceptions of risk, uncertainty, and distrust of others can shape firearm-related behaviors beyond documented demographic factors and past experiences with firearms. Perceived threats from others and a heightened sense of danger have been documented to correspond with riskier firearm behaviors such as unsecure storage and carrying firearms in public, especially among inexperienced firearm owners (Warner and Thrash, 2020; Buttrick, 2020; Stroud, 2012).

There remains limited research regarding how everyday experiences and perceptions of safety shape multiple risky firearm-related behaviors in a large sample of diverse firearm owners across different regions of the country. It is also unclear how risk and safety perceptions map onto firearm behaviors related to more specific actions like carrying frequency and storage mechanism alongside documented experiential correlates such as prior victimization and childhood firearm exposure. To address these gaps in the literature, we examined key psychosocial, experiential, and demographic correlates of firearm ownership, carrying, and storage practices in a large representative sample of firearm and non-firearm owners in five diverse states.

## 1. Data and methods

We collected data from 3,510 US adults residing in Colorado (N = 415), Minnesota (N = 673), Mississippi (N = 178), New Jersey (N = 540), and Texas (N = 1,704). The authors designed the survey and worked with survey research firm Ipsos to disseminate the instrument to respondents in all states. These states were chosen because they differ widely from one another culturally, politically, and geographically while varying significantly with regards to rates of gun violence and firearm legislation. For example, 38% of Mississippi residents identify as Black compared to 4.7% of Colorado residents (US Census Bureau, 2022). On the other hand, the firearm mortality rate in Mississippi is 33.9 per 1000,000 compared to 5.2 per 100,000 in New Jersey (Centers for Disease Control. Firearm mortality by state, 2021). All participants were recruited via email from KnowledgePanel (KP) by Ipsos between April 19 and May 15, 2022. KP is a probability-based web panel representative of the US and all recruited participants were required to be at least 18 years old and reside in one of the five states.

Design weights for all respondents were computed to reflect selection probability. Design weights were raked to geodemographic distributions (e.g. gender by age, race/ethnicity by state, gender by state, education by state) of the five states with finer adjustments within states and benchmarks obtained from the 2019 American Community Survey. The resulting weights were trimmed and scaled to match with the final qualified respondents. Each participant received a total sample weight and a state weight. We use the total sample weight since all analyses consider the entire sample of participants. Using the sample weights, the sample is representative of the five states included in the study. For a complete description of Ipsos KP's sampling and weighting methodology, please see https://www.ipsos.com/en-us/solutions/public-affairs/knowledgepanel. All activities were approved by the Institutional Review Board at Rutgers University in compliance with guidelines for protection of human subjects concerning safety and privacy. A copy of survey items used in this study is provided in Appendix A.

### 1.1. Firearm behaviors

The survey included questions regarding multiple firearm-related behaviors, which were used as dependent variables in this study. We measured *current firearm ownership* using the question, "Do you currently own a firearm?" (0 = no; 1 = yes). Among firearm owners (N = 1,165), we measured *number of total guns owned* using the question, "How many of each type of firearm do you currently have in or around your home?" related to (1) handguns, (2) shotguns, and (3) rifles. We used the question, "How frequently do you carry a firearm on your person outside of your home?" to create two dependent measures of *firearm carrying*. The first was a binary measure that indicated whether the individual carries at all outside of the home (0 = no; 1 = yes). The second included the following categories: (0) never, (1) rarely, (2) sometimes, (3) frequently, (4) almost always, and (5) always. We used binary indicators (0 = no; 1 = yes) of whether the firearm owner endorsed using the following *firearm storage techniques*: (1) gun safe, (2) gun cabinet, (3) locking device, (4) hard case, (5) hidden in a closet or drawer (unloaded), and (6) hidden in a closet or drawer (loaded).

### 1.2. Past experiences and psychosocial factors

We considered pertinent psychosocial predictors of firearm behaviors including whether or not there were any firearms in the participant's *childhood home* (0 = no; 1 = yes) and whether the person was ever *physically harmed* (shot, stabbed, struck, beaten, punched, or slapped around) (0 = no; 1 = yes).

To measure *everyday discrimination*, we used the Everyday Discrimination Scale, which included nine items following the prompt, "In your day-to-day life, how often do any of the following things happen to you?" Item examples included, "You are treated with less courtesy than other people are" and "You receive poorer service than other people at restaurants and stores." (Williams et al., 1997) Responses ranged from never (0) to almost every day (5). The scale exhibited high reliability (alpha = 0.896 and has been validated in previous studies (Krieger et al., 2005; Taylor et al., 2004).

To measure *intolerance of uncertainty,* we used seven items (alpha = 0.815) from the longer Intolerance of Uncertainty Scale, which assesses emotional, cognitive, and behavioral reactions to ambiguous situations (Buhr and Dugas, 2006). Item examples include, "Unforeseen events upset me greatly" and "I always want to know what the future has in store for me," with response categories ranging from not at all characteristic of me (1) to entirely characteristic of me (5).

We used the three-item Safety subscale of the Perceived Neighborhood Safety Scale (Sampson et al., 1997) to measure *neighborhood safety*. Items included: (1) "I feel safe walking in my neighborhood, day or night," (2) "Violence is not a problem in my neighborhood," and (3) "My neighborhood is safe from crime." (alpha = 0.860). Responses ranged from strongly agree (1) to strongly disagree (5). Higher scores on this scale indicated more negative perceptions of neighborhood safety.

We measured *threat sensitivity* using three items from the Post Traumatic Cognitions Inventory (Foa et al., 1999). Respondents were asked to indicate how strongly they disagreed or disagreed with the following three statements, (1) "People can't be trusted" (2) "I can't rely on other people" and (3) "People are not what they seem" (alpha = 0.825). Responses range from totally disagree (1) to totally agree (7).

Finally, we include two binary indicators of the firearm owners' *primary reason for ownership*: hunting and protection. These are included in all firearm owner-specific models.

### 1.3. Demographic factors

All models assessed for demographic differences across the following factors: age, sex, military status, education, household income, marital status, race, ethnicity (Hispanic), rurality, state of residence, political beliefs, and number of children in the home.

### 1.4. Analytic strategy

We used logistic regression to analyze psychosocial and demographic predictors of current firearm ownership in the full sample. We then used a negative binomial model to analyze predictors of the total number of firearms owned among firearm owners since the outcome was an over-dispersed count variable. We used logistic regression for whether individuals carry their firearm outside of the home as well as all measures of firearm storage. Finally, we used ordinal regression to assess the frequency of firearm carrying outside of the home given the variable's ranked order response categories. The results of logistic and ordinal logistic regressions are presented as odds ratios (OR). Coefficients for negative binomial models are transformed into incident rate ratios (IRR). We used listwise deletion to account for missing data (approximately 10% of the total sample) and discovered no discernible patterns of missingness. We replicated all models using chained equation multiple imputation and results were substantively identical (Donner, 1982). All analyses were carried out using Stata 17.

## 2. Results

Table 1 provides descriptive statistics for all variables included in our analysis. Table 2 presents the results regarding firearm ownership and the number of firearms owned. Childhood firearm exposure substantially increases the odds of firearm ownership in adulthood (OR = 4.13) and corresponds to more firearms owned (IRR = 1.398). Past physical victimization is significantly associated with firearm ownership (OR = 1.38) but not number of firearms owned. Greater intolerance of uncertainty (IRR = 0.98) and poorer perceived neighborhood safety (0.97) are associated with owning fewer total firearms, while greater threat sensitivity corresponds to owning more firearms (IRR = 1.03). Notably, none of the psychosocial indices were associated with firearm ownership in general.

Women are less likely to own firearms and they own fewer firearms when they are a firearm owner. Respondents with higher household incomes are more likely to be firearm owners while firearm owners with higher education are more likely to own more firearms. People who have never been married are both significantly less likely to own a firearm and own fewer firearms when they are owners. Those with more children are likely to own fewer guns. Participants in urban areas are less likely to own a firearm and own fewer firearms than their rural counterparts. People with increasingly liberal political beliefs are similarly less likely to own a firearm and own fewer firearms than conservatives. Finally, firearm owners whose primary reason for ownership is hunting are likely to own more firearms.

As shown in Table 3, greater scores on the Everyday Discrimination Scale have a small but significant association with odds of carrying outside of the home (OR = 1.04) while greater intolerance of uncertainty reduces the likelihood of carrying outside of the home (OR = 0.96). Older people are less likely to carry outside of the home and less likely to carry frequently than their younger counterparts. Similarly, women are less likely to carry and carry less frequently than men. People with more children at home are less likely to carry firearms and carry them outside of the home less frequently than those with fewer children. Rurality is associated with carrying outside of the home such that those living in urban areas are about 40% less likely to carry than those in non-metro rural areas. Those with increasingly liberal political views are less likely to carry outside of the home and carry frequently than conservatives. Finally, firearm owners whose primary reason for ownership is protection are about 50% more likely to carry a firearm outside of the home while those whose primary reason is for hunting carry in public less frequently.

Table 4 illustrates the predictors of firearm storage behaviors. Exposure to firearms in childhood increases the likelihood of storing firearms in a cabinet (OR = 2.86) although it does not correspond to other storage behaviors. Greater intolerance of uncertainty is associated

**Table 1**
Weighted Descriptive Statistics for Five U.S. States in 2022 (Full Sample, N = 3,510).

| | Mean (SD) | Range |
|---|---|---|
| *Firearm Behaviors* | | |
| Firearm Ownership | 0.29 (0.45) | 0-1 |
| # of Guns Owned* | 4.56 (4.68) | 0-30 |
| Carry a Firearm Out of the Home* | 0.54 (0.50) | 0-1 |
| Frequency of Carrying* | | |
| Never | 0.46 | |
| Rarely | 0.20 | |
| Sometimes | 0.11 | |
| Frequently | 0.09 | |
| Almost Always | 0.08 | |
| Always | 0.06 | |
| Gun Safe* | 0.41 (0.49) | 0-1 |
| Gun Cabinet* | 0.12 (0.33) | 0-1 |
| Locking Device* | 0.22 (0.42) | 0-1 |
| Hard Case* | 0.26 (0.44) | 0-1 |
| Drawer/Closet (Unloaded)* | 0.32 (0.47) | 0-1 |
| Drawer/Closet (Loaded)* | 0.23 (0.43) | 0-1 |
| Primary Reason (Hunting)* | 0.10 (0.30) | 0-1 |
| Primary Reason (Protection)* | 0.60 (0.49) | 0-1 |
| *Psychosocial Factors* | | |
| Childhood firearms exposure | 0.43 (0.50) | 0-1 |
| Past physical victimization | 0.32 (0.47) | 0-1 |
| Everyday discrimination | 7.75 (7.60) | 0-45 |
| Intolerance of uncertainty | 19.07 (5.62) | 3-35 |
| Perceived neighborhood safety | 6.89 (2.69) | 2-15 |
| Threat sensitivity | 11.98 (3.96) | 3-21 |
| *Demographics* | | |
| Age | 47.51 (17.03) | 18-94 |
| Female | 0.52 (0.50) | 0-1 |
| Current or former military service | 0.11 (0.31) | 0-1 |
| # of children in home | 0.65 (1.08) | 0-8 |
| Hispanic | 0.26 (0.44) | 0-1 |
| Education | | |
| No high school | 0.09 | |
| High school graduate | 0.28 | |
| Some college or Associate's | 0.30 | |
| Bachelor's or higher | 0.33 | |
| Household income | | |
| <$25,000 | 0.12 | |
| $25,000 to $49,999 | 0.17 | |
| $50,000 to $74,999 | 0.17 | |
| $75,000 to $99,999 | 0.14 | |
| $100,000 to $149,999 | 0.19 | |
| $150,000 or more | 0.20 | |
| Marital status | | |
| Widowed | 0.04 | |
| Divorced/Separated | 0.11 | |
| Never Married | 0.30 | |
| Race | | |
| White | 0.72 | |
| Black | 0.12 | |
| Other racial identity | 0.16 | |
| Rurality | | |
| Non-metro rural | 0.40 | |
| Metro rural | 0.30 | |
| Urban | 0.30 | |
| State | | |
| Texas | 0.55 | |
| Minnesota | 0.11 | |
| New Jersey | 0.17 | |
| Colorado | 0.12 | |

(continued on next page)

**Table 1** (*continued*)

| | Mean (SD) | Range |
|---|---|---|
| Mississippi | 0.06 | |
| | | |
| Political beliefs | | |
| Conservative | 0.34 | |
| Moderate | 0.41 | |
| Liberal | 0.25 | |

with reduced likelihood of storing a firearm in a gun safe (OR = 0.94) or a locking device (OR = 0.95). However, greater intolerance of uncertainty is also associated with higher likelihood of storing a firearm unloaded (OR = 1.04) or loaded (OR = 1.09) in a closet or drawer. Greater threat sensitivity increases the likelihood of storing a firearm in a gun cabinet (OR = 1.09) while more negative perceptions of neighborhood safety correspond with a greater risk of storing a firearm loaded in a closet or drawer (OR = 1.12).

Demographic factors vary across storage behaviors. Particularly high

**Table 2**
Psychosocial and Demographic Predictors of Firearm Ownership and # of Guns Owned.

| | *Current Firearm Owner* | | | | *# of Guns Owned* | | | |
|---|---|---|---|---|---|---|---|---|
| | OR | SE | *[95% CI]* | | IRR | SE | *[95% CI]* | |
| *Psychosocial Factors* | | | | | | | | |
| Childhood firearms exposure | **4.13** | **0.53** | **3.22** | **5.29** | **1.39** | **0.12** | **1.18** | **1.64** |
| Past physical victimization | **1.38** | **0.19** | **1.05** | **1.80** | 1.01 | 0.07 | 0.89 | 1.15 |
| Everyday discrimination | 1.01 | 0.01 | 0.99 | 1.03 | 1.00 | 0.01 | 0.99 | 1.01 |
| Intolerance of uncertainty | 0.99 | 0.01 | 0.97 | 1.02 | **0.98** | **0.01** | **0.97** | **0.99** |
| Perceived neighborhood safety | 0.98 | 0.02 | 0.93 | 1.03 | **0.97** | **0.01** | **0.95** | **1.00** |
| Threat sensitivity | 1.02 | 0.02 | 0.99 | 1.06 | **1.03** | **0.01** | **1.01** | **1.05** |
| *Demographics* | | | | | | | | |
| Age | 1.01 | 0.00 | 1.00 | 1.02 | **0.99** | **0.00** | **0.99** | **1.00** |
| Female | **0.40** | **0.06** | **0.31** | **0.53** | **0.74** | **0.05** | **0.64** | **0.86** |
| Education (No high school) | | | | | | | | |
| High school graduate | 0.97 | 0.34 | 0.49 | 1.93 | 1.27 | 0.19 | 0.94 | 1.71 |
| Some college or Associate's | 1.05 | 0.35 | 0.54 | 2.02 | **1.52** | **0.23** | **1.13** | **2.04** |
| Bachelor's or higher | 0.92 | 0.31 | 0.47 | 1.79 | **1.44** | **0.22** | **1.07** | **1.94** |
| Household income (<$25,000) | | | | | | | | |
| $25,000 to $49,999 | **1.86** | **0.55** | **1.04** | **3.33** | 1.04 | 0.19 | 0.73 | 1.49 |
| $50,000 to $74,999 | **2.40** | **0.74** | **1.31** | **4.39** | 1.15 | 0.21 | 0.80 | 1.64 |
| $75,000 to $99,999 | **2.72** | **0.87** | **1.45** | **5.11** | 1.29 | 0.23 | 0.90 | 1.84 |
| $100,000 to $149,999 | **2.74** | **0.88** | **1.46** | **5.15** | 1.30 | 0.24 | 0.90 | 1.87 |
| $150,000 or more | **3.00** | **0.99** | **1.57** | **5.75** | 1.35 | 0.26 | 0.93 | 1.96 |
| Marital status (Married) | | | | | | | | |
| Widowed | 1.04 | 0.26 | 0.63 | 1.71 | 1.21 | 0.15 | 0.95 | 1.55 |
| Divorced/Separated | 0.83 | 0.16 | 0.58 | 1.20 | 0.82 | 0.10 | 0.65 | 1.03 |
| Never Married | **0.55** | **0.11** | **0.37** | **0.82** | **0.72** | **0.09** | **0.57** | **0.92** |
| # of children in home | 0.99 | 0.07 | 0.87 | 1.13 | **0.92** | **0.03** | **0.86** | **0.99** |
| Race (White) | | | | | | | | |
| Black | 0.75 | 0.18 | 0.47 | 1.19 | 0.85 | 0.13 | 0.63 | 1.14 |
| Other racial identity | 0.75 | 0.17 | 0.48 | 1.18 | **0.78** | **0.09** | **0.62** | **0.98** |
| Hispanic | 0.76 | 0.14 | 0.53 | 1.09 | 1.11 | 0.12 | 0.89 | 1.38 |
| Rurality (Non-metro rural) | | | | | | | | |
| Metro rural | **0.65** | **0.10** | **0.48** | **0.88** | **0.75** | **0.06** | **0.64** | **0.87** |
| Urban | **0.65** | **0.11** | **0.47** | **0.91** | **0.69** | **0.06** | **0.59** | **0.81** |
| State (Texas) | | | | | | | | |
| Minnesota | **0.73** | **0.11** | **0.54** | **0.97** | 0.86 | 0.08 | 0.71 | 1.03 |
| New Jersey | **0.40** | **0.10** | **0.24** | **0.67** | 0.98 | 0.12 | 0.78 | 1.24 |
| Colorado | 0.84 | 0.17 | 0.57 | 1.25 | 0.87 | 0.08 | 0.71 | 1.05 |
| Mississippi | 1.32 | 0.36 | 0.77 | 2.27 | 0.99 | 0.11 | 0.80 | 1.23 |
| Political beliefs (Conservative) | | | | | | | | |
| Moderate | **0.73** | **0.11** | **0.55** | **0.98** | **0.79** | **0.06** | **0.68** | **0.92** |
| Liberal | **0.45** | **0.087** | **0.31** | **0.62** | **0.68** | **0.06** | **0.57** | **0.81** |
| Current/former military service | **1.89** | **0.39** | **1.26** | **2.84** | 1.01 | 0.08 | 0.87 | 1.19 |
| Primary reason for ownership | | | | | | | | |
| Hunting | – | | | | **1.41** | **0.15** | **1.15** | **1.74** |
| Protection | – | | | | 1.01 | 0.08 | 0.87 | 1.18 |
| Constant | **0.24** | **0.156** | **0.067** | **0.86** | **5.93** | **1.96** | **3.10** | **11.32** |
| N | | 3,159 | | | | 1,024 | | |
| R-squared | | 0.242 | | | | 0.059 | | |

Notes: Bolded text = Statistically significant at $p < .05$

**Table 3**
Psychosocial and demographic predictors of carrying outside the home and frequency of carrying (N = 1,024).

| | *Carry Outside the Home* | | | | *Carry Frequency* | | | |
|---|---|---|---|---|---|---|---|---|
| | OR | SE | *[95% CI]* | | OR | SE | *[95% CI]* | |
| *Psychosocial Factors* | | | | | | | | |
| Childhood firearms exposure | 1.02 | 0.21 | 0.68 | 1.53 | 1.05 | 0.21 | 0.71 | 1.55 |
| Past physical victimization | 1.26 | 0.24 | 0.86 | 1.85 | 1.31 | 0.23 | 0.93 | 1.85 |
| Everyday discrimination | **1.04** | **0.02** | **1.01** | **1.07** | 1.03 | 0.02 | 1.00 | 1.06 |
| Intolerance of uncertainty | **0.96** | **0.02** | **0.92** | **1.00** | 0.97 | 0.02 | 0.92 | 1.02 |
| Perceived neighborhood safety | 0.98 | 0.04 | 0.90 | 1.06 | 0.97 | 0.04 | 0.90 | 1.05 |
| Threat sensitivity | 1.02 | 0.03 | 0.97 | 1.08 | 1.02 | 0.03 | 0.96 | 1.08 |
| *Demographics* | | | | | | | | |
| Age | **0.96** | **0.01** | **0.95** | **0.98** | **0.96** | **0.01** | **0.95** | **0.98** |
| Female | **0.56** | **0.12** | **0.37** | **0.85** | **0.62** | **0.14** | **0.40** | **0.95** |
| Education (No high school) | | | | | | | | |
| High school graduate | 2.38 | 1.62 | 0.63 | 9.01 | 2.43 | 1.62 | 0.66 | 8.96 |
| Some college or Associate's | **3.79** | **2.56** | **1.01** | **14.22** | 2.98 | 1.92 | 0.84 | 10.56 |
| Bachelor's or higher | 1.96 | 1.37 | 0.50 | 7.71 | 1.53 | 1.03 | 0.41 | 5.71 |
| Household income (<$25,000) | | | | | | | | |
| $25,000 to $49,999 | 1.64 | 0.83 | 0.61 | 4.44 | 1.33 | 0.76 | 0.43 | 4.08 |
| $50,000 to $74,999 | 1.36 | 0.69 | 0.50 | 3.70 | 0.89 | 0.51 | 0.29 | 2.72 |
| $75,000 to $99,999 | 1.42 | 0.73 | 0.52 | 3.88 | 1.24 | 0.71 | 0.40 | 3.81 |
| $100,000 to $149,999 | 1.55 | 0.83 | 0.54 | 4.42 | 1.16 | 0.67 | 0.37 | 3.58 |
| $150,000 or more | 1.78 | 0.97 | 0.61 | 5.19 | 1.38 | 0.80 | 0.44 | 4.28 |
| Marital status (Married) | | | | | | | | |
| Widowed | 1.29 | 0.59 | 0.52 | 3.17 | 1.38 | 0.50 | 0.67 | 2.82 |
| Divorced/Separated | 0.66 | 0.17 | 0.40 | 1.09 | 0.69 | 0.18 | 0.42 | 1.14 |
| Never Married | 0.65 | 0.24 | 0.32 | 1.34 | 0.84 | 0.32 | 0.40 | 1.77 |
| # of children in home | **0.79** | **0.08** | **0.65** | **0.95** | **0.82** | **0.08** | **0.67** | **0.99** |
| Race (White) | | | | | | | | |
| Black | 1.13 | 0.42 | 0.54 | 2.36 | 1.20 | 0.43 | 0.59 | 2.43 |
| Other racial identity | 1.30 | 0.53 | 0.59 | 2.88 | 1.09 | 0.43 | 0.51 | 2.35 |
| Hispanic | 0.68 | 0.20 | 0.38 | 1.22 | 0.88 | 0.26 | 0.49 | 1.58 |
| Rurality (Non-metro rural) | | | | | | | | |
| Metro rural | 0.96 | 0.22 | 0.61 | 1.50 | 0.98 | 0.24 | 0.61 | 1.57 |
| Urban | **0.59** | **0.16** | **0.35** | **1.00** | 0.70 | 0.19 | 0.41 | 1.20 |
| State (Texas) | | | | | | | | |
| Minnesota | **0.41** | **0.11** | **0.24** | **0.70** | **0.43** | **0.11** | **0.26** | **0.69** |
| New Jersey | 0.84 | 0.36 | 0.36 | 1.97 | 0.71 | 0.29 | 0.32 | 1.59 |
| Colorado | 0.71 | 0.20 | 0.41 | 1.24 | 0.65 | 0.15 | 0.41 | 1.03 |
| Mississippi | 1.27 | 0.45 | 0.63 | 2.56 | 1.73 | 0.75 | 0.74 | 4.04 |
| Political beliefs (Conservative) | | | | | | | | |
| Moderate | **0.56** | **0.13** | **0.36** | **0.87** | **0.61** | **0.14** | **0.39** | **0.94** |
| Liberal | **0.31** | **0.09** | **0.18** | **0.53** | **0.31** | **0.09** | **0.18** | **0.55** |
| Current/former military service | 1.46 | 0.33 | 0.93 | 2.29 | 1.49 | 0.31 | 0.99 | 2.26 |
| Primary reason for ownership | | | | | | | | |
| Hunting | 0.86 | 0.26 | 0.47 | 1.57 | **0.54** | **0.16** | **0.31** | **0.95** |
| Protection | **1.49** | **0.30** | **1.00** | **2.22** | 1.15 | 0.25 | 0.74 | 1.77 |
| Constant | 6.83 | 8.65 | 0.57 | 81.72 | - | | | |
| R-squared | | | 0.140 | | | | 0.073 | |

Notes: Bolded text = Statistically significant at $p<.05$.

household income ($150,000 + ) increases the likelihood of storing firearms in a gun safe (OR = 3.14). Those who have never been married are less likely to store firearms in a gun safe or cabinet while those who are widowed are similarly less likely to storage weapons in a gun cabinet. Having more children in the home is associated with a greater likelihood of using a locking device and lower likelihood of storing a loaded firearm in a drawer or closet. Liberal and moderate individuals are significantly more likely to endorse using locking devices than their conservative counterparts. Current or former military personnel are much more likely to store loaded firearms in a drawer or closet than non-military persons (OR = 1.75). Finally, firearm owners whose primary reason for ownership is hunting are much more likely to use a hard case (OR = 2.52) while those whose primary reason for ownership is for protection are more likely to store firearms loaded in a drawer or closet (OR = 2.22).

**Table 4**
Psychosocial and Demographic Predictors of Firearm Storage Behaviors (N = 1,014).

| | *Gun Safe* | | *Gun Cabinet* | | *Locking Device* | | *Hard Case* | | *Drawer (Unloaded)* | | *Drawer (Loaded)* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OR | SE | OR | SE | OR | SE | OR | SE | OR | SE | OR | SE |
| *Psychosocial Factors* | | | | | | | | | | | | |
| Childhood firearms exposure | 1.16 | 0.25 | **2.86** | **0.95** | 0.92 | 0.23 | 0.92 | 0.21 | 0.87 | 0.18 | 1.46 | 0.34 |
| Past physical victimization | 0.84 | 0.17 | 0.96 | 0.25 | 0.76 | 0.17 | **0.66** | **0.14** | 0.88 | 0.17 | 1.35 | 0.30 |
| Everyday discrimination | 1.01 | 0.01 | 1.02 | 0.02 | 1.01 | 0.02 | 1.02 | 0.02 | 0.99 | 0.02 | 0.98 | 0.02 |
| Intolerance of uncertainty | **0.94** | **0.02** | 0.98 | 0.03 | **0.95** | **0.02** | 1.01 | 0.02 | **1.04** | **0.02** | **1.09** | **0.02** |
| Perceived neighborhood safety | 1.00 | 0.04 | 1.03 | 0.05 | 0.97 | 0.05 | 0.99 | 0.04 | 0.96 | 0.04 | **1.12** | **0.05** |
| Threat sensitivity | 1.01 | 0.03 | **1.09** | **0.04** | 1.02 | 0.03 | 1.01 | 0.03 | 0.96 | 0.03 | 0.96 | 0.03 |
| *Demographics* | | | | | | | | | | | | |
| Age | **0.97** | **0.01** | 0.98 | 0.01 | 0.99 | 0.01 | 0.98 | 0.01 | **1.02** | **0.01** | 0.99 | 0.01 |
| Female | 0.86 | 0.19 | 1.03 | 0.32 | 1.21 | 0.30 | 1.27 | 0.29 | 1.03 | 0.22 | 1.06 | 0.25 |
| Education (No high school) | | | | | | | | | | | | |
| High school graduate | 2.24 | 1.50 | 2.23 | 1.77 | 0.81 | 0.50 | 0.77 | 0.50 | 0.54 | 0.30 | 2.21 | 1.48 |
| Some college or Associate's | 2.07 | 1.38 | 3.78 | 2.85 | 1.38 | 0.79 | 0.79 | 0.51 | 0.95 | 0.53 | 2.88 | 1.86 |
| Bachelor's or higher | 2.13 | 1.41 | 2.33 | 1.72 | 1.87 | 1.07 | 0.88 | 0.57 | 1.06 | 0.60 | 2.06 | 1.33 |
| Household income (<$25,000) | | | | | | | | | | | | |
| $25,000 to $49,999 | 2.23 | 1.18 | 1.33 | 0.94 | 0.56 | 0.29 | 1.62 | 0.91 | 0.47 | 0.24 | 1.50 | 0.79 |
| $50,000 to $74,999 | 2.18 | 1.11 | 0.78 | 0.54 | 0.55 | 0.28 | 1.84 | 1.07 | 0.67 | 0.36 | 2.04 | 1.10 |
| $75,000 to $99,999 | 2.41 | 1.19 | 1.20 | 0.78 | **0.29** | **0.14** | 3.04 | 1.76 | 0.45 | 0.24 | 2.35 | 1.22 |
| $100,000 to $149,999 | 2.22 | 1.10 | 1.02 | 0.68 | **0.30** | **0.16** | 1.61 | 0.93 | 0.52 | 0.28 | 1.58 | 0.88 |
| $150,000 or more | **3.14** | **1.61** | 1.15 | 0.80 | 0.37 | 0.19 | 2.16 | 1.25 | **0.32** | **0.17** | 1.25 | 0.70 |
| Marital status (Married) | | | | | | | | | | | | |
| Widowed | 1.09 | 0.49 | **0.29** | **0.18** | 0.55 | 0.26 | 0.79 | 0.37 | 0.68 | 0.31 | 1.68 | 0.73 |
| Divorced/Separated | 0.79 | 0.23 | 0.53 | 0.27 | 0.74 | 0.24 | 1.28 | 0.42 | 1.36 | 0.40 | 0.71 | 0.24 |
| Never Married | 0.54 | 0.18 | **0.32** | **0.16** | 0.74 | 0.27 | 0.93 | 0.35 | 1.57 | 0.57 | 1.00 | 0.44 |
| # of children in home | 1.05 | 0.10 | 0.90 | 0.12 | **1.23** | **0.14** | 0.95 | 0.10 | 1.16 | 0.12 | **0.68** | **0.10** |
| Race (White) | | | | | | | | | | | | |
| Black | 0.91 | 0.39 | 0.85 | 0.55 | 1.01 | 0.43 | 0.48 | 0.22 | 0.56 | 0.24 | 0.98 | 0.43 |
| Other racial identity | 0.54 | 0.21 | 2.41 | 1.09 | 1.00 | 0.41 | 1.54 | 0.56 | 1.40 | 0.46 | 0.88 | 0.40 |
| Hispanic | 1.72 | 0.49 | 0.83 | 0.38 | 1.06 | 0.37 | **0.48** | **0.16** | 0.86 | 0.24 | 0.91 | 0.31 |
| Rurality (Non-metro rural) | | | | | | | | | | | | |
| Metro rural | 0.91 | 0.20 | 0.57 | 0.19 | 0.94 | 0.25 | 1.34 | 0.34 | 1.01 | 0.25 | 1.00 | 0.27 |
| Urban | **0.45** | **0.12** | 0.66 | 0.23 | 1.02 | 0.30 | 0.82 | 0.24 | 1.44 | 0.37 | 0.80 | 0.22 |
| State (Texas) | | | | | | | | | | | | |
| Minnesota | 0.63 | 0.16 | 1.38 | 0.44 | 0.72 | 0.22 | 0.70 | 0.19 | 0.76 | 0.19 | **0.45** | **0.16** |
| New Jersey | **3.23** | **1.22** | 1.19 | 0.67 | 1.28 | 0.59 | 0.84 | 0.38 | 0.63 | 0.27 | **0.06** | **0.04** |
| Colorado | 0.89 | 0.26 | 1.19 | 0.47 | 1.14 | 0.37 | 1.37 | 0.39 | 0.87 | 0.25 | **0.35** | **0.13** |
| Mississippi | 0.94 | 0.38 | 0.63 | 0.37 | 0.69 | 0.31 | 0.64 | 0.26 | 1.43 | 0.51 | 1.20 | 0.45 |
| Political beliefs (Conservative) | | | | | | | | | | | | |
| Moderate | 1.15 | 0.24 | 1.01 | 0.31 | **2.09** | **0.49** | 1.36 | 0.32 | 0.71 | 0.15 | 0.86 | 0.21 |
| Liberal | **0.60** | **0.16** | 1.18 | 0.45 | **2.19** | **0.64** | 1.72 | 0.49 | 1.35 | 0.34 | 0.65 | 0.22 |
| Current/former military service | 0.72 | 0.16 | 0.78 | 0.25 | 1.67 | 0.44 | 1.47 | 0.34 | 0.86 | 0.19 | **1.75** | **0.41** |
| Primary reason for ownership | | | | | | | | | | | | |
| Hunting | 0.89 | 0.26 | 1.39 | 0.48 | 0.54 | 0.22 | **2.52** | **0.79** | 1.09 | 0.32 | 0.63 | 0.24 |
| Protection | 0.74 | 0.15 | 0.96 | 0.29 | 1.03 | 0.24 | 1.33 | 0.32 | 0.92 | 0.20 | **2.22** | **0.58** |
| Constant | 2.85 | 3.02 | **0.04** | **0.06** | 1.35 | 1.56 | 0.26 | 0.35 | 0.39 | 0.47 | **0.02** | **0.02** |
| R-squared | 0.101 | | 0.106 | | 0.090 | | 0.067 | | 0.064 | | 0.185 | |

Notes: Bolded text = Statistically significant at $p < .05$.

## 3. Discussion

We examined the extent to which firearm ownership and firearm behaviors vary based on demographic and psychosocial factors in a large representative sample of individuals residing in five US states. The patterns that emerged appear to hinge upon three factors: who an individual is (e.g. demographics), what that individual has experienced (e.g. childhood exposure to firearms), and the extent to which that individual perceives threat and risk in their environment (e.g. perceived neighborhood safety).

With respect to who an individual is, several factors maintained consistent associations with firearm ownership and behaviors. The demographic findings largely corroborate prior research on those most likely to own firearms and engage in related firearm behaviors. For instance, men and individuals living in rural environments were more likely to own firearms, owned more firearms, were more likely to endorse carrying firearms outside the home, and reported a higher frequency of firearm carrying relative to women. Individuals in rural

environments were also more likely to use gun safes, which may reflect a greater likelihood of long gun ownership in rural communities (Jennissen et al., 2021). Individuals with conservative beliefs and those with current or past military affiliation exhibited similar patterns.

Each of these factors – gender, rurality, political beliefs, and military service – map onto typical patterns of firearm ownership pre-dating the recent surge in US firearm sales (Hamilton et al., 2018). These variables were included in our analyses simultaneously, mitigating concerns they are simply assessing the same underlying construct; however, it may be that common factors related to broader issues of masculinity or defensive culture influence firearm ownership and behaviors in a way that impacted these findings (Bock et al., 2021). For instance, a worldview driven by a sense that men must serve as defenders, including through the use of violence, may prompt conservative, rural males with military service to acquire and carry firearms and potentially store them less securely to maintain ready access when threatened (Carlson, 2015). Indeed, prior research has highlighted that White males from Southern and Western states are more likely than Northern Whites to carry firearms as a means of self-protection (Felson and Pare pp., 2010).

Variables related to past experiences were largely related to firearm ownership and carrying practices. Those who grew up in homes in which firearms were present were more likely to endorse firearm ownership and owned a higher number of firearms. Similar to the demographic findings, this may reflect cultural values and a tendency for individuals to embrace familiarity in their lives, maintaining behavioral practices modeled for them during childhood.

Notably, those with prior physical victimization experiences were more likely to own a firearm than those who did not report prior victimization. Those with a history of discrimination also endorsed slightly greater odds of carrying firearms outside the home. Although our cross-sectional data preclude a concrete understanding of directionality, one possibility is that prior experiences with threat – whether physical, verbal, or in some other form – may increase a firearm owner's drive to keep their firearm on their person for protection. In this scenario, the firearm serves as a tool to keep victimized individuals safe from repeat attacks in an environment they may view as unsafe. Greater access to a firearm may impart a heightened sense of protection and control in the face of future threats deemed more likely by past experiences (Buttrick, 2020).

Such findings align with the results from the third and final set of factors we considered: the ways individuals perceive threat in their immediate and broader environments. The issues of perceived threat, intolerance of uncertainty, and concern about risk represent some of the most novel findings of the current study. Consistent with expectations, those with greater sensitivity to threat were likely to own more guns. On the other hand, those who perceived their neighborhoods as less safe endorsed storing their firearms loaded and hidden in a closet or drawer. Similarly, those with greater intolerance of uncertainty were more likely to endorse unsecure storage methods including both loaded and unloaded storage in a closet or drawer. If a firearm owner views his or her immediate surroundings as more threatening, they may be motivated to acquire more firearms and keep them readily available in their homes to protect against home invasion. In this sense, such individuals may view their external environment (e.g. potential break-ins) as more threatening than the broader documented risks related to keeping firearms in the home (e.g., suicide, unintentional injury) and stage their homes accordingly (Hemenway, 2011; Hepburn and Hemenway, 2004; Miller and Hemenway, 2008).

The primary reason for firearm ownership also contributes to certain firearm behaviors. For instance, those that own firearms predominantly for hunting are likely to own more firearms but carry them less frequently outside of the home and endorse safer storage mechanisms (e.g., hard case). On the other hand, those that own firearms predominantly for protection are much more likely to carry them outside of the home and endorse the unsafe practice of loaded storage in a closet or drawer. These findings reinforce the notion that those who perceive greater risk (and a greater need for protective weapons) are more likely to engage in riskier firearm practices.

Taken together, our findings indicate that firearm ownership and riskier firearm behaviors (e.g. carrying, unsecure storage) may be more prominent among individuals influenced both by threatening experiences (e.g. physical assault) and perceptions of threat (e.g. neighborhood safety). The prevention implications for this point are substantial, as our findings indicate that how we message on gun violence prevention (e.g. the promotion of secure firearm storage) and what policies we consider to reduce the burden of gun violence in specific communities (e.g. addressing carrying practices in public spaces) need to be reflective of the combined demographic, experiential, and psychosocial characteristics of the community in question. Some policies and messages will have more universal impact than others, but no policy or message is likely to impact all communities equally.

Several meaningful limitations are worth noting. First, our data are cross-sectional and, as such, we were unable to test for causality. Second, although our use of probability-based sampling methods optimized the representativeness of our sample for the five states, our use of five states precludes understanding the extent to which our findings generalize nationally. Our sample was comprised predominantly of non-Hispanic, White respondents living in rural areas so future studies should consider risky firearm behaviors particularly among non-White participants living in urban and suburban areas. Third, our data relied upon self-report responses, which may differ from more objective measures. Although Ipsos makes efforts to ensure proper representativeness, the survey's recruitment via web panel may result in potential response bias due to self-selection into the sample. Finally, given our focus on individual factors, the data did not include information on state-level firearm laws. Future research should consider how these policies influence firearm-related behaviors in conjunction with the psychosocial and demographic factors analyzed here.

Despite these limitations, we believe our findings provide a meaningful examination of factors influencing firearm ownership and behavior in a diverse set of states. Beyond documented group differences and factors related to personal identity, past experiences and concerns about potential threats appear to also influence distinct firearm-related behaviors pertaining to ownership, storage, and carrying. Our results thus provide insight to support gun violence prevention efforts that include a nuanced understanding of how firearm behaviors vary from community to community.

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## CRediT authorship contribution statement

**Daniel C. Semenza:** Conceptualization, Methodology, Formal analysis, Writing – original draft, Supervision. **Lauren A. Magee:** Writing – original draft. **Michael D. Anestis:** Writing – original draft, Writing – review & editing. **Shani A.L. Buggs:** Writing – review & editing.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Data availability

Data will be made available on request.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.pmedr.2023.102269.

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