

Secure storage and/or defensive accessibility: Associations between firearm storage practices and definitions of responsible gun ownership in the United States

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Abstract

Objective: “Responsible gun ownership” is a complex topic, frequently invoked – we seek to unpack how firearm owners understand the term and how different models of firearms responsibility connect to home storage of firearms.

Methods: Using data from the nationally-representative 2024 National Firearms Survey (n = 4,059 American firearm owners) we employed latent profile analysis based on ratings of the importance, for responsible gun ownership, of both storing guns unloaded and locked up and keeping guns accessible for defensive use. We then examined how actual storage practices differed across resulting profiles.

Results: Much of the sample (70.8%) fell into two profiles that emphasized the importance of both secure storage and defensive accessibility for being a responsible gun owner. The remaining two profiles differentially-weighted accessibility and storage. However, even in the subgroup that emphasized storage over accessibility, only 53.1% locked up all their firearms. Demographics differed far less across profiles than did storage practices.

Conclusions: Most firearm owners reported that *both* having a gun accessible for defensive use and storing guns locked and unloaded were important for their definition of responsible gun ownership. These dual meanings are important in modeling connections between how firearm owners think and behave with their guns.

1. Introduction

Clinical guidance on household firearms recommends storing firearms unloaded and locked, with ammunition stored separately, (1, 2, 3) a recommendation that may conflict with the protective motivations that lead many owners to keep a firearm. (4) The potential disconnect between recommended storage practices and defensive firearm use has led some professional societies to frame secure storage as a basic tenet of responsible firearm ownership (5), and further informs recommendations to approach conversations with patients about firearm storage as conversations about "firearm responsibility" rather than as conversations about "firearm safety." (6) Responsibility is thus the offered entry point for storage conversations, which makes what owners count as responsible an important factor in whether those conversations can succeed. However, what "responsibility" entails for different populations of gun owners with regards to how they secure their firearms has not been well defined, and in fact, recent work (7, 8) suggests that it may be difficult to establish a consensus definition of "responsible gun ownership" as commonly-endorsed elements of responsibility— (a) storing firearms securely to reduce unauthorized access (5) and (b) keeping a firearm accessible for defensive purposes to protect oneself and family (4, 9)—may be in tension. The current study investigates two elements of responsibility (storage and accessibility) and their connection to storage behavior in a nationally representative sample of American gun owners. Using latent profile analyses on responses to questions about the nature of responsible firearm ownership, we first explore patterns of the importance assigned to secure storage and defensive accessibility in gun owners' conception of responsible gun ownership. We then examine if/how firearm storage behaviors are differentially distributed across these distinct attitudinal profiles of respondents.

2. Methods

2.1 Study Design and Population

Data are from the National Firearm Survey (NFS), a national web-based survey conducted in December 2024. Respondents were drawn from Ipsos' KnowledgePanel (KP), an online panel of approximately 60,000 U.S. adults that uses an equal probability of selection design to provide samples representative of the U.S. population. Participation invitations were emailed to 21,907 panel members; 12,909 completed the survey (survey completion rate = 59%). Gun ownership required respondents to have reported owning a working gun (n=4,059).

2.2 Measures

Responsible gun ownership is measured by item responses to the following question: "How important are each of the following for how you define what it means to be a responsible gun owner?" with the following items: [1] Guns stored locked and unloaded; [2] Gun handling practices; [3] Gun cleaning/maintenance; [4] Gun skills training/practice; [5] Educating others about gun practices (such as children); and [6] Guns kept accessible for defensive use. Response options were on a 4-point scale, with 1 = Not at all important and 4 = Very important, and item order was randomized across participants.

Our outcome of interest is *household firearm storage*, measured via 3 categories, capturing owners who [1] stored all their gun(s) unloaded and locked, [2] stored at least one gun loaded and unlocked, and [3] those with other storage practices – i.e., guns stored either loaded and locked, unloaded and unlocked, or both. We present a disaggregation of this mixed category in the online supplement. Demographic characteristics included in our analyses are age (measured in 10-year bins from 18-24 through 75+), gender (male; female), race/ethnicity

(White, non-Hispanic; Black, non-Hispanic; Other, non-Hispanic; Hispanic; 2+ races, non-Hispanic), marital status (now married; widowed; divorced; separated; never married), education (no high school diploma or GED; high school graduate [high school diploma or the equivalent GED]; some college or Associate's degree; Bachelor's degree; Master's degree or higher), income (measured in \$15,000 bins, from less than \$10,000 to \$150,000 or more), political conservatism (strong Republican; Republican; Independent or other [e.g., Libertarian]; Democrat; strong Democrat), household size, and number of children in the home under 17.

2.3 Statistical Analysis

We generated frequencies and percentages for categorical demographic variables and calculated means and standard deviations for continuous demographic variables. We used latent profile analysis (LPA), a person-centered, mixture-modeling strategy that identifies patterns of response within a sample and classifies people into subpopulations (profiles). By using a data-driven approach to creating classes, LPA ensures that distinctions between subpopulations align with variability in the sample, without having to resort to arbitrary variable cutoffs for categorization.

To aid in identifying the appropriate number of latent profiles, we built candidate solutions and then selected from them as follows: we required the smallest profile to contain at least 5% of the total sample, for interpretability, (10) and then used a cross-statistic weighting procedure (11) to identify the best-fitting profile solution. In models exploring whether these profiles differed on firearm storage behaviors, we used statistical procedures (12, 13) to properly account for the statistical indeterminacy involved in assigning any one person to a given profile.

(14)

1 We found nearly-uniform levels of agreement within our sample of firearm owners for
2 four of the six elements of responsibility: 98.6% rated handling as either somewhat or very
3 important; as did 94.5% when rating maintenance; 97.2% when rating skills training; and 96.8%
4 when rating educating others. Given this level of uniformity, we chose not to include these items
5 in the LPA analyses, as guidelines suggest that items with minimal variance will not contribute to
6 class differentiation. (15)

7 We focus, therefore, on two items with the greatest level of heterogeneity and the greatest
8 relevance for firearm storage practices: [1] Guns stored locked and unloaded and [2] Guns kept
9 accessible for defensive use.

10 See the Online Supplement for additional analytic details, including demographic
11 breakdowns across profiles. All analyses are unweighted. Analyses were run using *R* and MPlus.
12 All analysis scripts can be found at
13 https://osf.io/nm67r/overview?view_only=7fb19d607b5a4b78b151a139ebd73bac

14 2.4 Ethical Compliance

15 The Harvard TH Chan School of Public Health and Northeastern University Institutional
16 Review Boards (IRB) approved the study, determining that studies exclusively using National
17 Firearm Survey data meet the criteria for exemption from IRB review under protocols IRB# 24-
18 1483 (Harvard) and 24-11-09 (Northeastern).

19 **3. Results**

20 We present the sample demographics in Table 1. Our sample reported being 67.3% male,
21 77.9% White, with a median age-band of 55-64. The best-fitting solution ($-2LL = -7645.19$,
22 Akaike Information Criterion (AIC) = 15,316.40, Bayesian Information Criterion (BIC) =
23 15,398.32, Sample-Size Adjusted Bayesian Information Criterion (saBIC)= 15,357.01, Entropy

= 0.96, Classification Likelihood Min. = 0.95, Classification Likelihood Max. = 1.00) contained four profiles. See Table 2 for the average level of importance placed on storage and accessibility for “responsibility” across the four profiles. Just over 70% of gun owners (31.3% [Profile 1] and 39.5% [Profile 2]) were grouped into profiles that considered both secure storage and accessibility as important to their definition of responsible firearm ownership. The key factor distinguishing these two profiles was the relative importance placed on accessibility, with those in Profile 2 rating it as very important (Mean = 4.00), and those in Profile 1 rating it as important (Mean = 3.00). Profiles 3 and 4 differed considerably from Profiles 1 and 2 and from each other: Profile 3 owners (16.5% of all gun owners) emphasized the importance of storage (Mean = 3.62) far more than they emphasized accessibility (Mean = 1.75), but the reverse was true for those in Profile 4 (12.6% of owners), who emphasized accessibility as very important (Mean = 4.00) but storage much less so (Mean = 1.63).

Profile differences in at-home firearm storage practices are illustrated in Table 2. Owners in Profile 4 (rating accessibility as far more important than storage) were much more likely than owners in all other profiles to store at least one gun loaded and unlocked – 72.0% of those in this profile stored in this manner. Because such a high percentage of owners in Profile 4 stored a firearm loaded and unlocked, far fewer owners in this group reported the intermediate storage (locked/loaded or unlocked/unloaded), which was much more common among owners in the other profiles (Profiles 1 – 3). Among the profiles that rated storage as at least somewhat important for responsible ownership (Profiles 1 - 3), storing all guns locked and unloaded was still not common – reported by only about a third of the members of Profiles 1 and 2 (37.9% and 34.9%, respectively). Even among gun owners in Profile 3, who ranked securing all household

firearms as a far more important characteristic of responsible ownership than defensive accessibility, just over half (53.1%) reported storing all firearms unloaded and locked.

Demographic differences across profiles were fairly small. Using common rules of thumb for interpreting the effect size Cramer's V for the chi-square tests of differences across profiles, most of the effect sizes for demographic comparisons were small in magnitude ($V \cong 0.10-0.15$), whereas effect sizes for firearm storage behaviors were in the range of medium to large effects ($V \cong 0.25 - 0.50$). See the Online Supplement for means and pairwise tests.

4. Discussion

Most gun owners report that secure storage and defensive accessibility are *both* important for defining what it means to be a "responsible gun owner," suggesting that many owners (but not all) do not perceive such behaviors to be in tension with one another. Consistent with this possibility, we found low rates of storing all firearms both unloaded and locked up across *all* profiles, even among the group most strongly endorsing the importance of secure storage. While we focus, in this analysis, on understandings of responsibility and storage behaviors due to the importance placed on the construct by those in public health, it is possible that owners may be taking other elements into account in enacting their storage solutions; and feelings of responsibility may not motivate behaviors in other domains, such as handling or training, where there is more consensus on their importance for being a responsible firearm owner. In addition, there is heterogeneity in the degree to which owners report that their firearms help them to feel more responsible. (16) Future work, such as in-depth, qualitative studies with owners, would likely provide important additional insight into how owners evaluate the nature of responsible firearm ownership, as well as how they jointly balance elements of responsibility in making decisions about how to store firearms and/or keep them available for use. Such work, in concert

with the findings reported here, could inform developing clinical guidance about how to address firearm storage with patients and their families, especially with respect to whether discussions about "responsibility" in the abstract are likely to be persuasive to gun owners.

4.1 Limitations

Several limitations should be considered. First, we did not ask respondents to evaluate elements of responsibility against one another, likely masking nuance in owners' conceptualization of responsible ownership. Second, we did not ask whether any of the elements signified *irresponsible* ownership. It may be responsibility is constructed as much in the negative - things one should not do - as it is in the positive. (17) Third, social desirability may have influenced the reporting of both views on responsible firearm ownership and storage behavior. While 69.1% of participants were willing to report that they store firearms in ways other than unloaded and locked, such behavior may be even more prevalent in this sample. Regardless of these limitations, we use a large, high-quality, nationally-representative sample to demonstrate the heterogeneity within gun owners of a key aspect of firearm messaging, and show that different understandings of the importance of responsibility are associated with actual differences in the ways that firearms are stored at home.

5. Conclusion

Many medical societies recommend that clinicians tell their patients to store their guns unloaded and locked, with ammunition stored separately (1, 2, 3). Clinicians (e.g., 6) have sought to develop communication strategies framing this advice in terms of 'responsible gun ownership.' Our findings suggest, however, that gun owners, many of whom store at least one gun loaded and unlocked, believe that storing guns loaded and unlocked is not, in itself irresponsible, and that storing all guns unloaded and locked up is not, in itself responsible.

- 1 Clinicians who counsel patients to store all guns unloaded and locked up will likely have more
- 2 effective conversations with patients about gun storage if they keep this nuance in mind.

Contributions

All authors conceptualized the study. DA, MM collected the data; NB analyzed the data. All authors interpreted findings. NB, TW wrote the initial draft of the paper. All authors edited and approved the paper.

Competing Interests

None declared

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Table 1. Demographic characteristics of American firearm-owning participants in the 2024 National Firearm Survey.

Variables	N (%)
Gender	
Male	2,733 (67.3)
Female	1,326 (32.7)
Race/Ethnicity	
White, non-Hispanic	3,162 (77.9)
Black, non-Hispanic	351 (8.7)
Other, non-Hispanic	82 (2.0)
Hispanic	297 (7.3)
Multiracial	167 (4.1)
Age	
18-24	98 (2.4)
25-34	343 (8.5)
35-44	627 (15.5)
45-54	651 (16.0)
55-64	947 (23.3)
65-74	907 (22.4)
75+	486 (12.0)
Marital Status	
Now married	2,726 (67.1)
Widowed	207 (5.1)
Divorced	464 (11.4)
Separated	44 (1.1)
Never married	618 (15.2)
Education	
No high school diploma or GED	135 (3.3)
High school graduate (high school diploma or the equivalent GED)	891 (22.0)
Some college or Associate's degree	1,305 (32.2)
Bachelor's degree	1,011 (24.9)
Master's degree or higher	717 (17.7)
Income	
Less than \$10,000	81 (2.0)
\$10,000 to \$24,999	198 (4.9)
\$25,000 to \$49,999	472 (11.6)
\$50,000 to \$74,999	606 (14.9)
\$75,000 to \$99,999	558 (13.8)
\$100,000 to \$149,999	966 (23.8)
\$150,000 or more	1,178 (29.0)

Political Orientation	
Strong Republican	592 (14.6)
Republican	1,243 (30.6)
Independent or Other (e.g., Libertarian)	1,346 (33.2)
Democrat	604 (14.9)
Strong Democrat	228 (5.6)

Household Size	Mean = 2.52, SD = 1.33
Number of Children in the Home Under 17	Mean = 0.43, SD = 0.94

Note: All sample-sizes are unweighted.

Table 2. Average ratings of the importance of both storage and accessibility for what it means to be a responsible firearm owner and differential firearm storage behavior among American firearm owners (with standard errors in brackets) across four latent profiles of responsibility drawn from the 2024 National Firearms Survey

	Profile 1 (31.3%)	Profile 2 (39.5%)	Profile 3 (16.5%)	Profile 4 (12.6%)
<i>Importance for the meaning of responsible firearm ownership¹</i>				
Importance of guns stored locked and unloaded	3.36 [0.022]	3.65 [0.015]	3.62 [0.027]	1.63 [0.030]
Importance of guns kept accessible for defensive use	3.00 [0.00]	4.00 [0.00]	1.75 [0.017]	4.00 [0.00]
<i>At Home Gun Storage</i>				
Unloaded and locked	0.38 [0.014]	0.35 [0.013]	0.53 [0.020]	0.035 [0.010]
Loaded and unlocked	0.19 ^b [0.011]	0.21 ^a [0.012]	0.074 [0.011]	0.72 [0.023]
Mixed ²	0.44 [0.014]	0.44 [0.014]	0.40 [0.020]	0.25 [0.022]

Note: 1. rating scale goes from 1 = not at all important to 4 = very important. 2. A disaggregation of this category is presented in the Online Supplement. All omnibus tests of any difference across profiles were statistically significant; Pairwise comparisons are statistically different unless noted as follows: ^aNot different from Profile 1; ^bNot different from Profile 2