Prevalence and Correlates of Firearm Ownership in the Homes of Fifth Graders: Birmingham, AL, Houston, TX, and Los Angeles, CA

David C. Schwebel, PhD[1], **Terri Lewis, PhD**[1], **Thomas R. Simon, PhD**[2], **Marc N. Elliott, PhD**[3], **Sara L. Toomey, MD, MPhil, MPH, MSc**[4,5], **Susan R. Tortolero, PhD**[6], **Paula M. Cuccaro, PhD**[6], and **Mark A. Schuster, MD, PhD**[3,4,5]

[1]University of Alabama at Birmingham, AL, USA

[2]National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, Atlanta, GA, USA

[3]RAND Corporation, Santa Monica, CA, USA

[4]Division of General Pediatrics, Boston Children's Hospital, Boston, MA, USA

[5]Harvard Medical School, Boston, MA, USA

[6]The University of Texas Health Science Center at Houston, TX, USA

Abstract

Firearms in the home are associated with increased injury risk, especially when loaded and unlocked. In this study, 5,010 fifth-graders and their caregivers in three U.S. metropolitan areas participated in the 2004-2006 Healthy Passages study on adolescent health. Firearm ownership and storage patterns were examined by four self-reported sociodemographic characteristics (child's race/ethnicity, child's gender, family socioeconomic status, and study site) and reasons for ownership. Eighteen percent (*n* = 880) of the families reported firearms in the home. Families with African American and Hispanic children had lower odds of owning firearms than families with non-Hispanic White children. The most common reasons for ownership were protection from crime and hunting. Six percent (*n* = 56) of the families with firearms stored at least one firearm unlocked, assembled, without a trigger lock, and with unlocked ammunition. Compared with families with non-Hispanic White children, families with African American children engaged in safer storage practices. Results can inform childhood firearm injury prevention activities.

Firearms are present in the homes of between one fifth and one third of American children and adolescents (DuRant et al., 2007; Forbis et al., 2007; Schuster, Franke, Bastian, Sor, & Halfon, 2000; Sorenson & Vittes, 2004). Analyzing data from the 1994 National Health Interview Survey and its Year 2000 objectives supplement, Schuster and colleagues found that 35% of homes with children younger than age 18 years contained at least one firearm (Schuster et al., 2000); more recently, Coyne-Beasley, Miles, Lees, Proescholdbell, and Ford (2012) reported that 40% of North Carolina homes with children between the ages 0 and 18 surveyed in 2008 contained at least one firearm. Others have reported that about 20% of American adolescents (between the ages of 11 and 18) surveyed from 1994 to 1996 had access to firearms (Ruback, Shaffer & Clark, 2011). Analyzing data from the 2002 Behavioral Risk Factor Surveillance System, Okoro and colleagues estimated that more than 5% of American homes with children stored firearms unlocked and loaded—suggesting that about 1.6 million American children were living in homes where firearms were stored in a manner that made them accessible and potentially dangerous to children (Okoro et al., 2005). Similarly, analyzing data from the National Firearm Study 2004, Johnson and colleagues found that among families with children and at least one firearm in the home, 8% had firearms stored loaded and unlocked (Johnson, Miller, Vriniotis, Azrael, & Hemenway, 2006), and Coyne-Beasley et al. (2012) found in their 2008 survey of North Carolina homes with children that 7% of respondents with firearms had a firearm that was unlocked and loaded. In general, families with younger children (prior to adolescence, and especially prior to entering school) tend to store their firearms in a safer manner than those with older children or adolescents (Durant et al., 2007; Johnson et al., 2006). Coyne-Beasley et al. (2012) found the age-related effect was nonsignificant after controlling for race/ethnicity, with White non-Hispanic families more likely to store firearms unlocked and/or loaded than other racial/ethnic groups.

Although some data are available (Coyne-Beasley et al., 2012; DuRant et al., 2007; Ikeda, Dahlberg, Kresnow, Sacks, & Mercy, 2003; Schuster et al., 2000; Sorenson & Vittes, 2004), there is still limited understanding of the extent to which firearm ownership, reasons for owning, and storage practices vary by sociodemographic factors and how reasons for ownership relate to storage practices in homes with children. Differences in race/ethnicity and socioeconomic status (SES) are reported in multiple domains of health-related risk behaviors (Myers, 2009), and such differences may exist also in firearm ownership and storage practices. There may also be differences in firearm storage safety related to the reason for ownership.

Understanding these issues is critical because previous research suggests that the presence of firearms in a home can increase the risk of homicide, suicide, and unintentional firearm-related injuries among the home's inhabitants (American Academy of Pediatrics [AAP] Committee on Injury and Poison Prevention, 2012; Dahlberg, Ikeda, & Kresnow, 2004; Hemenway, 2012). In particular, firearms stored unlocked and loaded increase the odds of

intentional and unintentional pediatric firearm-related injuries (Grossman et al., 2005; Miller, Azrael, Vriniotis, & Hemenway, 2005). Given the potential for fatal and nonfatal firearm injuries to children from loaded and unlocked firearms in the home, the AAP and other professional medical associations recommend that pediatricians and other health care professionals ask patients about firearm ownership and discuss relevant risks with them (AAP Committee on Injury and Poison Prevention, 2000, 2012; American Medical Association, 2012). Recent evidence suggests pediatrician counseling on firearm ownership and storage is rare, but it is increasing in frequency (Chen, Kresnow, Simon, & Dellinger, 2007). Other firearm injury prevention strategies include educational programs and information campaigns around the safe storage and handling of firearms as well as technological modifications and installation of storage devices to make firearms more difficult for children to use or access. Knowledge about firearms storage practices in homes with children could help a range of professional and lay stakeholders, including clinicians, educators, community service providers, parents, and family members, to better understand the risks and to tailor firearm injury prevention messages and strategies.

Consideration of child development is also critical when studying the risks of firearms to children. We chose in this study to focus on fifth graders, a developmental stage when many youth are learning to safely handle and use firearms but before most jurisdictions permit youth to hunt or shoot without parental supervision. In Minnesota, for example, children of age 11 and above are eligible to enroll in state-monitored gun safety courses (http://www.dnr.state.mn.us/volunteer/novdec00/guns.html) but may not use firearms without adult supervision until age 14. Thus, this study sought to determine (a) which characteristics of families with fifth graders are associated with having firearms in the home and why they have firearms and (b) among families with firearms, which family characteristics are associated with storing firearms in ways that would make them more accessible to children.

Methods

Study Design and Data Source

This cross-sectional study used 2004 to 2006 data from eligible fifth graders and their primary caregivers (hereafter, "parents") who participated in Healthy Passages, a community-based study of adolescent health outcomes (Schuster et al., 2012; Windle et al., 2004). Participants were recruited from public schools in three geographic areas: (a) 10 contiguous public school districts in and around Birmingham, Alabama; (b) 25 contiguous public school districts in Los Angeles County, California; and (c) the largest public school district in Houston, Texas. Sampling was conducted to ensure adequate sample sizes of African American, Hispanic, and White students. Within each of the three sites, a two-stage probability sampling procedure was employed. In the first stage, schools were randomly sampled using probabilities that were a function of how closely a school's racial/ethnic mix corresponded to the site's racial/ethnic target. In the second stage, all fifth graders ($N = 11,532$) in regular classrooms of sampled schools ($N = 118$) were invited to participate. About 58% of students' families ($n = 6,663$) agreed to be contacted for study participation. Seventy-seven percent of those students ($n = 5,147$) completed an interview. All parents provided informed consent, and all youth provided developmentally appropriate assent.

Parent-reported measures were used in the present study. The Healthy Passages study encompassed questioning on a broad range of topics. Potentially sensitive topics, including questions about firearms, were posed using audio-computer-assisted self-interview. The study protocol was approved by institutional review boards at all three study sites and at the Centers for Disease Control and Prevention. Data were weighted and imputed to ensure accurate statistical representation of the complex sample design. Details of the Healthy Passages study protocol, sampling plan, participant enrollment, and data weighting and imputation are available elsewhere (Schuster et al., 2012; Windle et al., 2004).

Study Participants

The sample for this study includes 5,010 fifth graders (mean age = 10.6 years, *SD* = 0.6; 49% male) and their parents. Of the 5,147 children in the Healthy Passages study, 28 were excluded from this analysis because their parents did not complete parent-report measures (only child-report measures were available), 14 were excluded because no information on SES was available, and 95 were excluded because parents refused the item asking if they had a firearm in the home. Participating youth were 34% African American, 35% Hispanic, 25% non-Hispanic White, and 6% multiracial or other racial/ethnic groups. The vast majority of parent respondents were female (93%).

Measures

Demographic Measures—Parents reported their education level, their child's gender and race/ethnicity, and household income. The parent's education level and household income were standardized and then aggregated as a measure of family SES (specifically, mother's education level, father's education level, and household income were each standardized, and then the standardized values for mother education, father education, and household income times two were averaged to create the aggregate). Higher *z* scores represent higher education and income levels.

Firearms Measures—Parents completed several items regarding firearms in their homes. They were instructed that "Firearms include pistols, shotguns, rifles, and other types of guns. Do not include BB guns, starter pistols, paintball guns, or guns that cannot fire." To determine whether firearms were present in the home, dichotomous ("yes" vs. "no") responses were collected to the following question: "Are any firearms now kept in or around your home? Include those kept in a garage, outdoor storage area, truck, or car."

Parents who reported having firearms were then asked, "What are the reasons you own firearms? Please choose all that apply." Response options included "protection from crime," "hunting," "target shooting," "firearm collection," "work related," and "another reason," which provided for an open-ended explanatory response. Responses of "another reason" (*n* = 76) were considered by two independent coders, who reclassified them, when possible, into one of the other five categories. The "firearm collection" category was expanded to include weapons identified as inherited in the open-ended response. Responses of "another reason" that could not be reclassified (*n* = 29, typically because of vagueness) were excluded from subsequent analyses. Intercoder agreement on reclassification was perfect (kappa = 1.00).

Finally, the safety of firearm storage practices was assessed by asking parents a series of items related to firearm and ammunition storage. Responses were collapsed into two categories for analytic purposes. Firearms were considered to be stored in a safer way if parents reported that all firearms were either kept in a locked place or were kept in an unlocked place but were unassembled, assembled with trigger locks installed, or stored separately from locked ammunition. Households where parents reported that at least one firearm was stored unlocked, assembled, without trigger locks, and with unlocked ammunition were considered to be households with less safe firearms storage.

Statistical Analysis

All analyses employed design and nonresponse weights and accounted for both the effects of weights and the clustering of children within study sites (cell and analysis sample sizes are unweighted). Analyses were conducted in three steps using SAS version 9.2 (SAS Institute, Cary, NC). First, descriptive and multivariable inferential statistics were calculated to consider associations between four sociodemographic factors (child gender, child race/ethnicity, family SES, and study site) and firearm ownership. Second, including only those families who reported having firearms in the home, descriptive and inferential statistics were computed to examine associations between the four sociodemographic factors and the reason for firearm ownership. Third, a multivariable logistic regression model was constructed predicting safer versus less safe firearm storage practices based on the four sociodemographic factors and the reason for ownership. An alpha value of .05 was used to determine statistical significance for all analyses.

Results

Table 1 presents the descriptive data for the sample, as well as the results of the multivariable-weighted logistic regression analysis assessing firearm ownership based on sociodemographic characteristics. Eighteen percent of the respondent parents ($n = 880$) reported having firearms in the home. Firearm ownership varied by sociodemographic characteristics. Compared with families of children of non-Hispanic White background, families with children of African American (adjusted odds ratio [aOR] = 0.56; 95% confidence interval [CI] = 0.42, 0.76), Hispanic (aOR = 0.44; 95% CI = 0.30, 0.65), or other/multiracial (aOR = 0.35; 95% CI = 0.24, 0.51) background had lower odds of having firearms in the home. Families with a high SES had higher odds of having firearms in the home than those with a low SES (aOR = 1.93; 95% CI = 1.68, 2.21). Relative to families at the Birmingham site, families at the Los Angeles (aOR = 0.27; 95% CI = 0.20, 0.37) and Houston (aOR = 0.74; 95% CI = 0.57, 0.98) sites had lower odds of having firearms in the home.

The most commonly reported reason for firearm ownership was protection from crime (60%), followed by hunting (36%), target shooting (22%), firearm collection (17%), and work related (7%). Six hundred and five (69%) of the respondent parents reported owning firearms for just one reason, with 21% ($n = 181$) reporting two reasons to own firearms, 8% ($n = 69$) three reasons, and 3% ($n = 25$) four reasons. The most common patterns of having multiple reasons to own firearms were for both protection and hunting (6%; $n = 53$), for both

hunting and target shooting (5%; $n = 40$), for both protection and target shooting (4%; $n = 37$), and for protection, hunting, and target shooting (3%; $n = 27$).

Table 2 shows the weighted descriptive percentages across sociodemographic characteristics by reason for ownership, and Table 3 displays the results from five multivariable logistic regressions examining the associations between sociodemographic characteristics and the reason for ownership. Several patterns emerged. Protection from crime was the primary reason for firearm ownership at all study sites and across all child race/ethnic groups except non-Hispanic Whites, for whom hunting was the primary reason to own firearms. Families with African American children had higher odds of owning firearms for protection from crime (aOR = 4.49; 95% CI = 2.68, 7.50) but lower odds of owning them for hunting (aOR = 0.14; 95% CI = 0.09, 0.23), target shooting (aOR = 0.10; 95% CI = 0.05, 0.20), or firearm collection (aOR = 0.26; 95% CI = 0.13, 0.51) than families with non-Hispanic White children. Families with Hispanic children had lower odds of owning firearms for hunting (aOR = 0.25; 95% CI = 0.15, 0.43) but higher odds of owning them for work (aOR = 7.49; 95% CI = 2.43, 23.11) than families with non-Hispanic White children. Families with children of other/multiracial background had higher odds of having firearms for protection from crime (aOR = 2.56; 95% CI = 1.07, 6.11) but lower odds of having them for hunting (aOR = 0.22; 95% CI = 0.07, 0.69) than families with non-Hispanic White children.

High SES was associated with a higher odds of owning firearms for hunting (aOR = 1.50; 95% CI = 1.19, 1.89), target shooting (aOR = 1.56; 95% CI = 1.08, 2.24), and firearm collection (aOR = 1.35; 95% CI = 1.04, 1.74). Compared with families in Birmingham, families in Los Angeles had lower odds of reporting hunting as the reason for firearm ownership (aOR = 0.20; 95% CI = 0.11, 0.38) and families in Houston had lower odds of reporting firearm collection (aOR = 0.45; 95% CI = 0.26, 0.78).

Table 4 presents descriptive data on firearm storage practices as well as the results of multivariable logistic regressions examining factors associated with firearm storage practices. Among families with a firearm, 6% reported storing firearms in a manner that was less safe. Two associations of interest emerged. First, families with African American children showed lower odds of less safe firearms storage (aOR = 0.20; 95% CI = 0.07, 0.53) than families with non-Hispanic White children. Second, families who owned firearms for work had higher odds of storing firearms in a less safe way (aOR = 2.88; 95% CI = 1.05, 7.90).

Discussion

Eighteen percent of homes with fifth graders in the locations studied contained at least one firearm. Overall, 6% of these homes with firearms contained one or more firearms stored unlocked, assembled, without trigger locks, and with unlocked ammunition. The prevalence of firearms ownership reported by this sample is lower than figures reported by samples in other published reports, which generally hover between 20% and 35% among American individuals living in homes with children present (Coyne-Beasley et al., 2012; Johnson, Coyne-Beasley, & Runyan, 2004; Schuster et al., 2000; Sorenson & Vittes, 2004). Prevalence of storing firearms in a manner in which they might be accessible and potentially

dangerous to children living in the home also tended to be lower in this sample than in previous work. Data-coding strategies vary somewhat across studies, but comparable figures in the literature range from 5% to 14% of children's homes with firearms stored unlocked and loaded (Azrael, Miller, & Hemenway, 2000; Coyne-Beasley et al., 2012; Johnson et al., 2004; Johnson et al., 2006; Schuster et al., 2000).

It is unclear why ownership and accessible storage might be lower in this sample than others, but two possible explanations might be considered. First, this study examined families living in three metropolitan, mostly nonrural, geographic locations; ownership in Birmingham was above previous reports from national samples, but ownership in Houston and especially Los Angeles was below previous reports. Previous publications report data representative of either national (Azrael et al., 2000; Johnson et al., 2004; Johnson et al., 2006; Schuster et al., 2000) or state-wide (North Carolina, Coyne-Beasley et al., 2012; California, Sorenson & Vittes, 2004) populations, including individuals living in rural environments. Second, past research has shown that female respondents may not be aware of firearms owned by males in the household or how those firearms are stored, and women who are knowledgeable about household firearms may be more reluctant to disclose firearm ownership (Hepburn, Miller, Azrael, & Hemenway, 2007). Therefore, the prevalence estimate of firearm ownership in this study is likely to be conservative given that most respondent parents were women (93%).

Firearm ownership, storage practices, and reason for ownership in our study all varied by sociodemographic characteristics. In general, families with high SES, those with non-Hispanic White children, and those in Birmingham were more likely to own firearms than families with low SES; those with African American, Hispanic, or other/multiracial children; and those in Los Angeles and Houston. Findings concerning racial/ethnic and SES differences replicate some previous work (e.g., Coyne-Beasley et al., 2012; DuRant et al., 2007; Schuster et al., 2000; Sorenson & Vittes, 2004) among children in a particular developmental stage (fifth grade) and in three U.S. cities. Overall, the most commonly reported reason for owning a firearm was protection from crime, followed by hunting, target shooting, and firearm collection. The fact that most families reported keeping firearms for protection might reflect concern about crime. Among high-income countries, the United States has a high crime rate (Harrendorf, Heiskanen, & Malby, 2010), and media dramatization of vulnerability to crime is pervasive in the United States (Dowler, 2003).

When the reason for ownership was examined by sociodemographic characteristics, several patterns emerged. First, the vast majority (82%; $n = 227$) of firearms-owning families with African American children owned firearms for protection from crime, perhaps in response to the fact that African American individuals are more often the victims of violent crimes than individuals of other racial/ethnic backgrounds (Peterson & Krivo, 2005). Second, families with high SES and those with non-Hispanic White children were more likely to own firearms for sport (both hunting and target shooting) and as part of a collection. Previous research has shown that non-Hispanic White individuals in Alabama hunt at higher rates than individuals belonging to other racial/ethnic groups and individuals in other states, especially California (U.S. Fish & Wildlife Service, 2010). Firearm ownership also tends to be higher in southern U.S. states than some other regions of the country (Okoro et al., 2005).

Only a few sociodemographic factors were associated with firearm storage practices. Families with African American children were more likely to report safer storage practices; families that kept firearms for work-related purposes were not. Future research is needed to examine potential mediating and confounding factors to explain these associations.

An understanding of firearm ownership and storage practices is essential to develop effective strategies to reduce youths' unsupervised access to firearms. There are several potential strategies, including firearm injury prevention counseling by pediatricians; educational programs for parents, children, or entire communities; and technological changes to make firearms more difficult for youth to fire (AAP Committee on Injury and Poison Prevention, 2012; Barkin et al., 2008). Although early results are encouraging and suggest safe firearm storage practices that can be adopted in homes with children as a result of specific strategies (e.g., pediatric counseling with distribution of cable locks and installation of firearm storage cabinets in homes in rural areas), many strategies have not been evaluated carefully, and additional research is needed to determine which strategies are most effective in reducing youths' unsupervised access to firearms and risk for lethal injury (Barkin et al., 2008; Grossman et al., 2012; Hardy, 2006).

Results such as those obtained in this Healthy Passages study can be used to understand why families with children store firearms in the home and to tailor prevention messages to population subgroups. Firearm education and counseling, for example, may benefit from addressing how best to balance personal safety with tailored firearm safety messages to maximize children's safety. Even though firearm ownership for work was less common among the sample than other reasons for ownership, those families that owned firearms for work-related purposes had more than twice the odds of reporting less safe storage practices compared with families that owned firearms for other reasons. Families with Hispanic children, who were least likely to report firearm ownership, were more likely to report that they owned a firearm because of work (e.g., aOR was 7.44 times that of families with non-Hispanic White children). The relatively high levels of less safe storage practices among those who own firearms because of work suggest that it cannot be assumed that individuals who work with firearms will use safe storage practices. These findings also suggest that there may be a need for enhanced prevention messages about gun storage practices from employers.

Our report has both strengths and limitations. Strengths include a large and diverse sample, targeted inquiries about the reason why firearms are kept in the home, and use of computer-assisted technology to ask about potentially sensitive topics like firearms. Limitations include the reliance on only self-reported data, the use of data that are several years old, and the restriction to three metropolitan U.S. geographic locations. Also limiting was our focus on fifth graders. We felt this to be a critical developmental stage because fifth graders are often still learning firearms safety, but future work might consider younger and older age groups.

Two final limitations are methodological. First, the overall response rate for the study was 43%. To improve the representativeness of the intended population, we employed nonresponse weights. When such approaches are applied to a probability sample such as

Healthy Passages, response rates are not strongly related to nonresponse bias (Groves & Peytcheva, 2008), and one can assume the generalizability of results to the population of interest. Second, some cell sizes in our analyses were small (<5). We performed bivariate sensitivity analyses employing a Fisher's exact test method that is robust to small cell sizes but which does not accommodate weights to address the complex sample design, and the results were similar to those presented. This gives us confidence that the results presented are robust to the small cells that exist.

In conclusion, firearms were present in the homes of many fifth graders in the locations studied, and they were sometimes stored unsafely. Firearm ownership, storage practices, and reasons for ownership all vary by sociodemographic characteristics. Future research is needed to continue to examine the factors related to the presence of firearms in the home with children, the safety of storage practices, and the impact of strategies such as counseling by pediatricians and other professionals, educational programs and other strategies around the safe storage and handling of firearms, and technological or storage devices to reduce pediatric firearm-related injury rates.

Acknowledgments

References

American Academy of Pediatrics Committee on Injury and Poison Prevention. Firearm-related injuries affecting the pediatric population. Pediatrics. 2000; 105:888–895. [PubMed: 10742344]

American Academy of Pediatrics Committee on Injury and Poison Prevention. Firearm-related injuries affecting the pediatric population. Pediatrics. 2012; 130:e1416–e1423. [PubMed: 23080412]

American Medical Association. H-145.990 Prevention of firearm accidents in children. 2012. 2012. Retrieved from https://ssl3. ama-assn.org/apps/ecomm/PolicyFinderForm.pl?site=www.ama-assn.org&uri=%2fresources%2fdoc%2fPolicyFinder%2fpolicyfiles%2fHnE%2fH-145.990.HTM

Azrael D, Miller M, Hemenway D. Are household firearms stored safely? It depends on whom you ask. Pediatrics. 2000; 106:e31–e36. [PubMed: 10969115]

Barkin SL, Finch SA, Ip EH, Scheindlin B, Craig JA, Steffes J, Wasserman R. Is office-based counseling about media use, timeouts, and firearm storage effective? Results from a cluster-randomized, controlled trial. Pediatrics. 2008; 122:e15–e25. [PubMed: 18595960]

Chen J, Kresnow M, Simon TR, Dellinger A. Injury-prevention counseling and behavior among US children: Results from the second injury control and risk survey. Pediatrics. 2007; 199:e958–e965. [PubMed: 17403833]

Coyne-Beasley T, Miles DR, Lees AC, Proescholdbell SK, Ford CA. Disparities in firearms ownership and storage practices in North Carolina. Southern Medical Journal. 2012; 105:225–230. [PubMed: 22475675]

Dahlberg LL, Ikeda RM, Kresnow M. Guns in the home and risk of a violent death in the home: Findings from a national study. American Journal of Epidemiology. 2004; 160:929–936. [PubMed: 15522849]

Dowler K. Media consumption and public attitudes toward crime and justice: The relationship between fear of crime, punitive attitudes, and perceived police effectiveness. Journal of Criminal Justice and Popular Culture. 2003; 10:109–126.

DuRant RH, Barkin S, Craig JA, Weiley VA, Ip EH, Wasserman RC. Firearm ownership and storage patterns among families with children who receive well-child care in pediatric offices. Pediatrics. 2007; 119:e1271–e1279. [PubMed: 17545359]

Forbis SG, McAllister TR, Monk SM, Schlorman CA, Stolfi A, Pascoe JM. Children and firearms in the home: A Southwestern Ohio Ambulatory Research Network (SOAR-NET) study. Journal of the American Board of Family Medicine. 2007; 20:385–391. [PubMed: 17615419]

Grossman DC, Mueller BA, Riedy C, Dowd MD, Villaveces A, Prodzinski J, Harruff R. Gun storage practices and risk of youth suicide and unintentional firearm injuries. Journal of the American Medical Association. 2005; 293:707–714. [PubMed: 15701912]

Grossman DC, Stafford HA, Koepsell TD, Hill R, Retzer KD, Jones W. Improving firearm storage in Alaska Native villages: A randomized trial of household gun cabinets. American Journal of Public Health. 2012; 102:S291–S297. [PubMed: 22401514]

Groves RM, Peytcheva E. The impact of nonresponse rates on nonresponse bias: A meta-analysis. Public Opinion Quarterly. 2008; 72:167–189.

Hardy M. Keeping children safe around guns: Pitfalls and promises. Aggression and Violent Behavior. 2006; 11:352–366.

Harrendorf, S.; Heiskanen, M.; Malby, S. International statistics on crime and justice: European Institute for Crime Prevention and Control and United Nations Office on Drugs and Crime 2010. 2010. Retrieved from http://www.unodc.org/documents/data-and-analysis/Crime-statistics/International_Statistics_on_Crime_and_Justice.pdf

Hemenway D. Risks and benefits of a gun in the home. American Journal of Lifestyle Medicine. 2012; 5:502–511.

Hepburn L, Miller M, Azrael D, Hemenway D. The US gun stock: Results from the 2004 National Firearms Survey. Injury Prevention. 2007; 13:15–19. [PubMed: 17296683]

Ikeda RM, Dahlberg LL, Kresnow MJ, Sacks JJ, Mercy JA. Studying "exposure" to firearms: Household ownership v access. Injury Prevention. 2003; 9:53–57. [PubMed: 12642560]

Johnson RM, Coyne-Beasley T, Runyan CW. Firearm ownership and storage practices, U.S. households, 1992-2002: A systematic review. American Journal of Preventive Medicine. 2004; 27:173–182. [PubMed: 15261906]

Johnson RM, Miller M, Vriniotis M, Azrael D, Hemenway D. Are household firearms stored less safely in homes with adolescents? Archives of Pediatric & Adolescent Medicine. 2006; 160:788–792.

Miller M, Azrael D, Vriniotis M, Hemenway D. Firearm storage practices and rates of unintentional firearm deaths in the United States. Accident Analysis & Prevention. 2005; 37:661–667. [PubMed: 15949457]

Myers HF. Ethnicity-and socio-economic status-related stresses in context: An integrative review and conceptual model. Journal of Behavioral Medicine. 2009; 32:9–19. [PubMed: 18989769]

Okoro CA, Nelson DE, Mercy JA, Balluz LS, Crosby AE, Mokdad AH. Prevalence of household firearms and firearm-storage practices in the 50 states and the District of Columbia: Findings from the behavioral risk factor surveillance system, 2002. Pediatrics. 2005; 116:e370–e376. [PubMed: 16140680]

Peterson PD, Krivo LJ. Macrostructural analyses of race, ethnicity, and violent crime: Recent lessons and new directions for research. Annual Review of Sociology. 2005; 31:331–356.

Ruback RB, Shaffer JN, Clark VA. Easy access to firearms: Juveniles' risks for violent offending and violent victimization. Journal of Interpersonal Violence. 2011; 26:2111–2138. [PubMed: 20724298]

Schuster MA, Elliott MN, Kanouse DE, Wallander JL, Tortolero SR, Ratner JA, Banspach SW. Racial and ethnic health disparities among fifth-graders in three cities. New England Journal of Medicine. 2012; 367:735–745. [PubMed: 22913683]

Schuster MA, Franke TM, Bastian AM, Sor S, Halfon N. Firearm storage patterns in US homes with children. American Journal of Public Health. 2000; 90:588–594. [PubMed: 10754974]

Sorenson SB, Vittes KA. Adolescents and firearms: A California statewide study. American Journal of Public Health. 2004; 94:852–858. [PubMed: 15117711]

U.S. Fish & Wildlife Service. Trends in fishing and hunting 1991-2006: A focus on fishing and hunting by species. 2010. (Addendum to the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, 2010). Retrieved from http://digitalmedia.fws.gov/cdm/ref/collection/document/id/305

Windle M, Grunbaum JA, Elliott M, Tortolero SR, Berry S, Gilliland J, Schuster M. Healthy passages: A multilevel, multimethod longitudinal study of adolescent health. American Journal of Preventive Medicine. 2004; 27:164–172. [PubMed: 15261905]

Table 1

Demographic Data Predicting Endorsement of Firearms in the Home (*N* = 5,010) and Multivariable Weighted Logistic Regression Predicting Presence of Firearms in the Home.

	No Firearms in the Home (*N* = 4,130)	Firearms in the Home (*N* = 880)	aOR	95% CI
Child race/ethnicity				
Non-Hispanic White (ref, *n* = 1,247)	61%	39%		
African American (*n* = 1,721)	84%	16%	0.56[***]	0.42, 0.76
Hispanic (*n* = 1,733)	93%	7%	0.44[****]	0.30, 0.65
Other/multiracial (*n* = 309)	90%	11%	0.35[****]	0.24, 0.51
Study site				
Birmingham (ref, *n* = 1,561)	69%	31%	—	—
Houston (*n* = 1,764)	85%	15%	0.74[*]	0.57, 0.98
Los Angeles (*n* = 1,685)	94%	6%	0.27[****]	0.20, 0.37
	M (*SD*)	*M* (*SD*)		
Standardized family SES (high relative to low)	−0.26 (0.87)	0.46 (0.78)	1.93[****]	1.68, 2.21

Note. aOR = adjusted odds ratio; CI = confidence interval; ref = referent; SES = socioeconomic status.

[*] *p* < .05.

[***] *p* < .001.

[****] *p* < .0001.

Table 2

Weighted, Descriptive Demographic Data for Reason Firearms Are in the Home ($N = 880$).

	Protection ($n = 525$)	Hunting ($n = 319$)	Target ($n = 193$)	Collection ($n = 149$)	Work ($n = 58$)
Child race/ethnicity					
African American ($n = 275$)	82%	14%	3%	6%	5%
Non-Hispanic White ($n = 443$)	45%	59%	34%	27%	2%
Hispanic ($n = 129$)	59%	18%	21%	17%	18%
Other/multiracial ($n = 33$)	65%	18%	18%	14%	7%
Study site					
Birmingham ($n = 440$)	55%	47%	26%	23%	3%
Houston ($n = 303$)	68%	31%	16%	10%	10%
Los Angeles ($n = 137$)	51%	11%	27%	24%	12%
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Standardized family SES (high relative to low)	0.34 (0.73)	0.75 (0.71)	0.78 (0.69)	0.72 (0.67)	0.27 (0.81)

Note. SES = socioeconomic status. Parents were permitted to offer multiple reasons for having firearms, so the sum of reasons exceeds 100%.

Table 3

Results From Five Weighted, Multivariable Logistic Regression Analyses Predicting Each Reason for Having Firearms in the Home.

	Protection		Hunting		Target		Collection		Work	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
Child race/ethnicity										
Non-Hispanic White (ref)	—		—		—		—		—	
African American	4.49****	2.68, 7.50	0.14****	0.09, 0.23	0.10****	0.05, 0.20	0.26***	0.13, 0.51	2.35	0.91, 6.08
Hispanic	1.44	0.77, 2.72	0.25****	0.15, 0.43	0.80	0.43, 1.49	0.96	0.42, 2.16	7.49***	2.43, 23.11
Other/multiracial	2.56*	1.07, 6.11	0.22*	0.07, 0.69	0.42	0.14, 1.32	0.46	0.14, 1.43	2.68	0.63, 10.16
Study site										
Birmingham (ref)	—		—		—		—		—	
Houston	1.27	0.81, 2.00	1.09	0.69, 1.72	0.76	0.51, 1.13	0.45**	0.26, 0.78	1.38	0.58, 3.28
Los Angeles	0.73	0.41, 1.29	0.20****	0.11, 0.38	1.20	0.67, 2.17	1.07	0.58, 1.96	1.56	0.56, 4.36
Standardized family SES (high relative to low)	0.83	0.62, 1.12	1.50***	1.19, 1.89	1.56*	1.08, 2.24	1.35*	1.04, 1.74	1.17	0.68, 2.03

Note. aOR = adjusted odds ratio; CI = confidence interval; ref = referent; SES = socioeconomic status. Sample *N* for all analyses = 880. Parents were permitted to offer multiple reasons for having firearms, so some participants are included in multiple analyses.

*
$p < .05$.

**
$p < .01$.

***
$p < .001$.

****
$p < .0001$.

Multivariable, Weighted Logistic Regression Analysis Predicting Less Safe Storage of Firearms in the Home (*N* = 880).

	Less Safe Storage (*n* = 56)	Safer Storage (*n* = 824)	aOR	95% CI
Child race/ethnicity				
Non-Hispanic White (ref, *n* = 443)	9%	91%	—	—
African American (*n* = 275)	2%	98%	0.20**	0.07, 0.53
Hispanic (*n* = 129)	7%	93%	0.83	0.34, 2.00
Other/multiracial (*n* = 33)	5%	95%	0.56	0.07, 4.56
Reasons for having firearms				
Protection (*n* = 525)	6%	94%	1.43	0.79, 2.60
Hunting (*n* = 319)	7%	93%	0.87	0.41, 1.83
Target (*n* = 193)	7%	93%	0.95	0.48, 1.86
Collection (*n* = 149)	9%	91%	1.25	0.51, 3.02
Work (*n* = 58)	12%	88%	2.88*	1.05, 7.90
Study site				
Birmingham (ref, *n* = 440)	7%	93%	—	—
Houston (*n* = 303)	5%	95%	0.62	0.26, 1.50
Los Angeles (*n* = 137)	6%	94%	0.73	0.25, 2.13
	M (*SD*)	*M* (*SD*)		
Standardized family SES (high relative to low)	0.60 (0.69)	0.45 (0.79)	1.05	0.70, 1.58

Note. aOR = adjusted odds ratio; CI = confidence interval; ref = referent; SES = socioeconomic status. Parents were permitted to offer multiple reasons for having firearms.

*p < .05.

**p < .01.