ARTICLE

Parental Misperceptions About Children and Firearms

Frances Baxley, MD; Matthew Miller, MD, ScD

Objective: To assess the accuracy of parental predictions about their children’s self-reported behavior around household guns.

Design: Survey.

Setting: Family practice clinic in rural Alabama.

Participants: Convenience sample of parents and their children aged 5 to 14 years.

Intervention: Questionnaires about firearms administered separately to children and their parents.

Main Outcome Measures: Rates of concordance and discordance between parents and their children living in homes with guns about whether the children knew the storage location of household firearms and had ever handled firearms in the home.

Results: Of 420 parent-child dyads, 314 agreed to participate; 201 of the 314 homes contained guns. Children younger than 10 years were as likely as older children to report knowing the storage location (73% vs 79%, respectively) and to report having handled a household gun (36% vs 36%, respectively). Thirty-nine percent of parents who reported that their children did not know the storage location of household guns and 22% of parents who reported that their children had never handled a household gun were contradicted by their children’s reports. Such discordance between parent and child reports was unrelated to whether parents stored their firearms locked away or had ever discussed firearm safety with their children.

Conclusions: Many parents who were living in homes with firearms and who reported that their children had never handled firearms in their homes were contradicted by their children’s self-reports. Parents who locked their guns away and discussed gun safety with their children were as likely to be contradicted as parents who did not take such safety measures.

Arch Pediatr Adolesc Med. 2006;160:542-547

IN THE UNITED STATES, FIREARM injury accounts for 10% of all deaths among children aged 5 to 14 years, surpassed only by malignant neoplasms and motor vehicle crashes.1 For every firearm-related child death in this age group, 3 children are injured by nonfatal gunshots,2 and 25% of those children have permanent physical sequelae.3 Many of these injuries occur when a child gains access to household firearms that are stored loaded and/or in unlocked locations.4-13

Several medical associations advise parents who decide to keep firearms in the home to store all of the household guns locked away and to separate ammunition from the gun.14-18 Despite these recommendations, firearms are as likely to be present in US homes with children as in homes without children, and they are often stored in unlocked locations and/or loaded.19

To our knowledge, our study is the first to examine how well parents’ perceptions about their children’s access to household guns coincide with their children’s self-reports. We surveyed parents and their children (aged 5-14 years) attending a pediatric and family practice clinic in rural Alabama to assess how accurately parents could predict whether their children reported knowing where household firearms were stored and reported ever handling firearms in their homes.

METHODS

During the summer of 2002, research assistants in a pediatric ambulatory and family practice clinic located in rural Alabama approached all of the parents of children aged 5 to 14 years who were attending well-child or sick appointments and asked them to participate in this study. Parents and their children who agreed to participate were separated and given questionnaires about firearm ownership; neither heard the responses of the other. Parents completed questionnaires in the wait-
ing area; in a separate room, children were read the questionnaires aloud and their responses were recorded. During each week of enrollment, at least three fourths of all of the parent-child pairs agreed to participate in the study. If a parent accompanied 2 children, the younger child’s questionnaire was selected for inclusion in the study. Each parent and child questionnaire was coded with a unique alphanumeric identifier used to match parent-child pairs without the use of names. Written informed consent was obtained from parents, and verbal informed consent was obtained from children.

**PARENTS’ SURVEYS**

Parents’ surveys comprised 20 items. Sixteen items were about firearms. After an initial set of demographic questions to determine the age and sex of their children, parents were asked a series of questions to elicit information about family firearm ownership and storage practices, including questions about whether household firearms were stored loaded and/or locked away when not in use (as distinguished from having child-safety locks). Specifically, parents were asked the following questions: (1) Are any firearms in your home stored loaded? (2) Is the firearm(s) in your home stored locked up when not in use? (3) Does your child know where the firearm(s) in your home is stored? (4) Has your child ever handled the firearm(s) in your home? and (5) Have you discussed firearm safety with your child?

**CHILDREN’S SURVEYS**

Children’s surveys comprised 18 items. Children were asked the following questions (in order): (1) Are there any toy guns in your house? (2) What kind of toy guns (including BB guns)? (3) Are there any real guns in your house? (4) Do you know where the real gun(s) in your house is stored? and (5) Have you ever held or played with the real gun(s) in your house? Completed questionnaires were placed in a box for data entry at a later time. To determine the rate of participation, data collectors tallied the number of families approached and the number who consented each day. Children who reported ever handling a firearm in their home were asked, “Was this done with your parents’ knowledge and permission?” During the informed consent process, children were told that their answers would be kept confidential unless there was concern that they might be putting themselves at risk of harm.

Only households with firearms were included in the study. Data on firearm storage practices among all of the households with firearms are based on parent responses. Concordance and discordance rates between parental perceptions and children’s self-report are based on parent-child dyads for which the parent reported at least 1 firearm in the home and for whom we have complementary responses regarding knowledge of where household firearms were stored and whether the child had ever handled a household firearm.

Concordance between parents’ perceptions and the self-reported behavior of their children is summarized as the sensitivity of the parent’s report relative to the child’s behavior. For example, with respect to whether parents accurately identified children who had handled firearms in their homes, the sensitivity is the percentage of children who reported having handled firearms in the home who were correctly identified by their parents as having handled them (true positives divided by the sum of true positives plus false negatives). Discordance is expressed using another metric commonly used in screening literature: 1 minus the negative predictive value (1–NPV). The complement of the NPV (1–NPV) is the percentage of parents who reported that their children are naïve with respect to guns who were contradicted by their children’s reports. Bivariate relationships between categorical variables were evaluated using Pearson χ² statistic.

**RESULTS**

Of the 314 parents, 201 (64%) reported the presence of at least 1 gun in the home (Table 1). Approximately half of all of the children in homes with guns were boys (n = 100); slightly more than half were aged 10 to 14 years (n = 108). Forty-five percent of the homes contained guns for recreational purposes only, 26% for protection only, and 29% for both purposes. Ninety-one percent of parents in homes with guns discussed gun safety with their children. Nine in 10 parents were female.

Among the 196 parents who reported household guns and provided full information about how those guns were stored, 110 (56%) stored all of the household guns unloaded and locked away, 61 (31%) stored at least 1 firearm unloaded and unlocked, and 25 (13%) stored at least 1 gun loaded (Table 2). Gun storage practices were not significantly associated with the sex or age of the child, but they were associated with the reason parents gave for keeping a gun. Seventy percent of households with firearms used only for recreational purposes stored their firearms unloaded and locked away compared with 52% of households with firearms kept solely for protection (rate ratio [RR], 1.35; 95% confidence interval [CI], 1.00-1.83). Parents who reported that their children either knew the storage location of household firearms or had ever handled firearms in their homes were more likely to store all of the household firearms locked up and unloaded (RR, 1.53; 95% CI, 1.07-2.18).

One hundred ninety children and their parents living in homes with guns reported definitively whether they...
knew and thought their children knew, respectively, the storage location of the guns in their homes. One hundred forty-one of these parents (74%) reported that they thought their children knew where household firearms were stored (Table 3). Parents accompanying girls were as likely as parents accompanying boys to report that their children knew where household guns were stored. Parents were less likely, however, to expect their children
to know the storage location if the children they accompanied were younger than 10 years (RR, 0.84; 95% CI, 0.71-1.00). Parents were more likely to report that their children knew where household firearms were kept if firearms were owned for recreation only (RR, 1.72; 95% CI, 1.27-2.34) or for both recreation and protection (RR, 1.63; 95% CI, 1.18-2.25) as compared with owning them for protection only. In contrast to parents’ expectations, children younger than 10 years were as likely as older children to report that they knew the storage location of household firearms (RR, 0.92; 95% CI, 0.78-1.08). Children were also as likely to report knowing the storage location in homes where all of the household firearms were locked away as in homes with at least 1 unlocked firearm (RR, 1.16; 95% CI, 0.97-1.39).

One hundred seventy-seven children and their parents living in homes with guns reported definitively whether they had ever and thought their children had ever, respectively, handled a firearm in their homes. Sixty-one parents (34%) in gun-owning households reported that they thought their children had handled a firearm in the home (Table 3). Sixty-three children (36%) in homes with firearms reported that they had handled a firearm in the home. Parents accompanying boys were more likely than parents accompanying girls to expect their children to have handled a household gun (RR=2.31; 95% CI, 1.45-3.68). Compared with parents who kept guns solely for protection, parents who kept guns solely for recreational purposes were significantly more likely to report that their children had handled a gun in the home (RR, 3.14; 95% CI, 1.53-6.43). Consistent with parents’ expectations, boys were more likely than girls to report having handled a gun in the home (RR, 2.84; 95% CI, 1.75-4.61); children younger than 10 years were as likely as children aged 10 to 14 years to have handled a firearm in the home (RR, 1.00; 95% CI, 0.67-1.29); children in homes where all of the guns were locked away were as likely as children in homes where firearms were unlocked to have handled firearms in the home (RR, 0.86; 95% CI, 0.58-1.29). Among the 63 children who reported ever handling a firearm in the home, 18 reported that they jointly owned the gun with a parent or grandparent; 1 child reported that the gun was his own (not shown). Sixty-two of 63 children who reported handling a firearm also reported that they had parental permission to do so.

The vast majority of children who reported knowing where firearms were stored in their homes were identified by their parents as knowing so (sensitivity, 87%) (Table 4). Significantly fewer parents who kept firearms solely for protection or who never discussed firearm safety with their children were able to identify whether their children knew the storage location (sensitivity, 69% and 60%, respectively, compared with all of the other parents). Overall, 39% of parents who reported that their children were unaware of the storage location of the guns were contradicted by their children’s reports (1−NPV=39%). Among parents in households in which firearms were kept for protection, half reported that their children did not know where the household firearms were stored; 1 in 3 parents were contradicted by their children’s reports (1−NPV=33%).

Of the children who reported that they had handled firearms in the home, 60% were identified by their parents as ever having handled firearms (sensitivity, 60%) (Table 4). Parents who kept firearms solely for protection were significantly less likely to accurately predict that their children reported having handled firearms in the home. Of the 27% of children living in homes where firearms were kept solely for protection who reported hav-
ing handled firearms in their homes, only 1 in 4 were identified by their parents as ever having handled firearms (sensitivity, 25%) (Table 4). Among the 66% of all of the parents living in homes with firearms who reported that their children had not handled a household gun, 22% were contradicted by their children’s reports (1−NPV = 22%). Parents accompanying boys were significantly more likely than parents accompanying girls to be contradicted (36% vs 12%, respectively; P<.05).

**COMMENT**

To our knowledge, this is the first study to explore whether a child’s access to household firearms is associated with the age or sex of children in the home, the firearm counseling parents give children about gun safety, or the manner in which household firearms are stored. In contrast to previous studies, that found a greater tendency to store firearms unloaded and locked away if at least 1 child in the home was younger than 13 years, we found no statistically significant association between the child’s age and household firearm storage practices. Although it is possible that parents in rural Alabama do not consider their children’s age relevant to their decision about how to store household firearms, it is also possible that they factor age into storage decisions but distinguish between teenagers and younger children rather than between the ages of children included in our study, i.e., between ages 5 and 14 years. It is also possible that we found no association between storage practices and the child’s age because we only knew the age of the child accompanying the parent on the day of the survey rather than the age and sex distribution of all of the children living in each home.

In our study, children younger than 10 years were as likely as older children to report knowing where household firearms were stored as well as handling firearms in the home. Furthermore, children in homes where all of the guns were stored locked away were as likely as children in homes with firearms stored unlocked to report having handled a gun in the home. Because we do not know whether a child who reported ever handling firearms in his or her home had in fact handled firearms under storage conditions reflected by his or her parent’s response to questions about current storage practices, we cannot say that locking firearms away had no effect on the ease with which children could gain access to household firearms. In addition, because we asked only whether the child knew where firearms were stored or had ever handled a household firearm rather than the frequency or ease with which the child could gain access to the gun (e.g., in a moment of crisis), our findings do not necessarily mean that storage practices are ineffective in retarding children’s access to guns in the home.

Parents’ beliefs about their children’s broader experience with guns were associated with storage practices. Parents who reported that their children either knew the storage location of household guns or had, at some point, handled a gun in the home were more likely than those who did not report these details to store all of the household firearms locked up and unloaded (62% vs 40%, respectively). This finding suggests that addressing the disconnect between parental perceptions and children’s reported knowledge of and behavior around household firearms might induce some parents to alter their storage practices.

Although the vast majority of children (87%) who reported knowing where firearms were stored in their homes were correctly identified by their parents as knowing so, fewer children (60%) who reported ever handling firearms in their homes were correctly identified by their parents as having handled firearms. Findings from other studies, also suggest that parental misperceptions about their ability to predict their own children’s likelihood of handling firearms are common. For example, in a survey of parents in metropolitan Atlanta, Ga, three quarters of parents believed that their children could tell the difference between toy and real guns and trusted that if their children encountered a real gun, they would tell an adult rather than handle it. A later study among different subjects demonstrated that 63% of boys between the ages of 8 and 12 years who found a real gun handled it (approximately half of whom thought it was a toy or were unsure whether it was a real gun), and 30% actually pulled the trigger with enough force to fire the gun had it not been disabled. More than 90% of these children said they had previously received gun safety instructions.

Ninety-one percent of parents in our study who lived in gun-owning households said they had discussed gun safety with their children; 64% reported storing guns locked away. Previous work has shown that discussing gun safety and locking household guns away are the 2 measures most commonly relied on by parents to ensure their children’s safety around guns in the home. Indeed, the American Academy of Pediatrics, the American Academy of Family Practice, and the American Medical Association encourage these measures as effective means of decreasing pediatric firearm morbidity. Parents in our study who had taken such safety measures, however, were no less likely to be contradicted by their children’s reports about knowing where household guns were stored or about handling household guns. This finding suggests that common preventative measures for ensuring children’s safety around household guns often fail to prevent children from gaining unacknowledged access to household guns and may, in fact, lead parents to have misplaced confidence in their ability to accurately predict their children’s broader experience with guns in the home.

Our study has various limitations. It is set in rural Alabama, limiting generalizability. Results are based on self-report and thus are subject to potential inaccuracies attributable to social desirability responses, recall bias, intentional distortions, or nondisclosure. For example, parents might be reluctant to admit that their children knew where firearms were stored (or that their children had handled firearms in the home) if they feel that researchers will not approve of this practice. Children may be reluctant to report handling firearms in the home for fear of being discovered to have broken house rules, or they may report having had permission when they did not.

Our finding that 62 of 63 children who reported handling firearms in the home said they did so with parental knowledge may be an example of nondisclosure re-
spouse since two fifths of parents accompanying these children reported that their children never handled a firearm in their homes. Alternatively, this apparent contradiction could result if fathers had accurate information about their children's activities around guns but mothers did not (as 90% of our parents were female). Nevertheless, although this discrepancy highlights a limitation to our study, our findings still suggest that in a region where gun ownership is prevalent and where children are frequently included in gun-related activities, many mothers appear to be misinformed about the extent of their children's potential access and exposure to household guns.

Despite these limitations, the picture that emerges from our study is that parental predictions, most of which are maternal predictions, tend to be more sensitive than specific with regard to their children's behavior around household guns. Two fifths of the parents in our study who reported that their children did not know the storage location of guns in their homes and one fifth who reported that their children never handled a firearm in their homes were contradicted by their children's reports.

Accepted for Publication: October 31, 2005.

Correspondence: Matthew Miller, MD, ScD, Harvard School of Public Health, 677 Huntington Ave, Room 305, Boston, MA 02115 (mmiller@hsph.harvard.edu).

Author Contributions: Drs Baxley and Miller had full access to all of the data in the study and take full responsibility for the integrity of the data and the accuracy of the data analysis.

Acknowledgment: We acknowledge the helpful comments provided by Deborah Azrael, PhD, David Hemenway, PhD, and Renee M. Johnson, PhD, and the support of Nath Camp, MD, and the entire staff of the family and pediatric practice at which this survey took place.

REFERENCES