Parental Misperceptions About Children and Firearms

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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.

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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 questionnaire 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
Child Reported Handling Firearms in the Home

- Never discussed gun safety with child
- Some unlocked
- Household firearms
- Purpose of firearms
- Parent report
- Child’s age, y
- Child’s sex

Table 4. Concordance and Discordance Between Parent and Child Responses to Questions About Household Firearms*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Child Reported Knowing Firewall Storage Location</th>
<th>Child Reported Handling Firearms in the Home</th>
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</thead>
<tbody>
<tr>
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<td>Sensitivity, %</td>
<td>P Value</td>
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<tr>
<td>All children</td>
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<td>NA</td>
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<tr>
<td>Child’s sex</td>
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<tr>
<td>Boy</td>
<td>84</td>
<td>.31</td>
</tr>
<tr>
<td>Girl</td>
<td>90</td>
<td>.09</td>
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<tr>
<td>Child’s age, y</td>
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<td></td>
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<tr>
<td>&lt;10</td>
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<tr>
<td>Some unlocked</td>
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<td>.01</td>
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<td>Reference</td>
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<tr>
<td>Recreation only</td>
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<td>Both protection and recreation</td>
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<td>.01</td>
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<td>Parent report</td>
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<tr>
<td>Discussed gun safety with child</td>
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<td>.009</td>
</tr>
<tr>
<td>Never discussed gun safety with child</td>
<td>60</td>
<td>.01</td>
</tr>
</tbody>
</table>

Abbreviations: NA, not applicable; NPV, negative predictive value.

*Concordance is the sensitivity of parents’ responses to their children’s responses and is equal to the percentage of children who reported ever handling a firearm in their homes who are identified by their parents as having handled a firearm in their homes (ie, true positives divided by the sum of true positives plus false negatives). Discordance is the complement of the NPV (1−NPV) and is equal to the percentage of parents who reported that their children have never handled a firearm in their homes and are contradicted by their children’s reports.

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 stored 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-owners 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 firearm (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 identi-
ified 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
studies20,21 that found a greater tendency to store fire-
arms unloaded and locked away if at least 1 child in the
home was younger than 13 years, we found no statisti-
cally significant association between the child’s age and
household firearm storage practices. Although it is possi-
ble 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 chil-
dren included in our study, ie, 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 house-
hold 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 chil-
dren 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 fire-
arms in his or her home had in fact handled firearms un-
der storage conditions reflected by his or her parent’s re-
sponse 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 house-
hold 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
(eg, in a moment of crisis), our findings do not neces-
sarily mean that storage practices are ineffective in re-
tarding children’s access to guns in the home.

Parents’ beliefs about their children’s broader expe-
rience 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 house-
hold firearms locked up and unloaded (62% vs 40%, re-
spectively). This finding suggests that addressing the dis-
connect 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 re-
ported knowing where firearms were stored in their homes
were correctly identified by their parents as knowing so,
children (60%) who reported ever handling fire-
arms in their homes were correctly identified by their par-
ents as having handled firearms. Findings from other stud-
ies22,23 also suggest that parental misperceptions about their
ability to predict their own children’s likelihood of han-
dling firearms are common. For example, in a survey of
parents in metropolitan Atlanta, Ga, three quarters of par-
ents believed that their children could tell the difference
between toy and real guns and trusted that if their chil-
dren encountered a real gun, they would tell an adult rather
than handle it.23 A later study24 among different subjects
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 work25 has shown that discussing
gun safety and locking household guns away are the
2 measures most commonly relied on by parents to en-
sure their children’s safety around guns in the home. In-
deed, the American Academy of Pediatrics,14 the Ameri-
can Academy of Family Practice,15 and the American
Medical Association16 encourage these measures as ef-
effective means of decreasing pediatric firearm morbid-
ity. Parents in our study who had taken such safety mea-
sures, however, were no less likely to be contradicted by
their children’s reports about knowing where house-
hold guns were stored or about handling household guns.
This finding suggests that common preventative mea-
sures for ensuring children’s safety around household guns
often fail to prevent children from gaining unacknow-
ledged 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 Al-
abama, limiting generalizability. Results are based on self-
report and thus are subject to potential inaccuracies at-
tributable to social desirability responses, recall bias,
intentional distortions, or noncandid responses.26 For ex-
ample, parents might be reluctant to admit that their chil-
dren know where firearms are stored (or that their chil-
dren have 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 hav-
ing handling firearms in the home said they did so with
parental knowledge may be an example of noncandid re-
sponse 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.

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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.

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REFERENCES


In 1943 an editor of Pocket Books asked me to write a book and said, half jokingly, “It doesn’t have to be a very good book because at 25 cents a copy we can sell ten thousand every year.”
—From A Better World for Our Children, by Benjamin Spock, 1994