

Seeing Is Believing: What Do Boys Do When They Find a Real Gun?

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ABSTRACT. *Objectives.* To determine how boys behave when they find a handgun in a presumably safe environment and to compare parental expectations of their child's interest in real guns with this observed behavior.

Methods. A convenience sample of 8- to 12-year-old boys was recruited from families that completed a survey on firearm ownership, storage practices, and parental perceptions. Parents were asked to rate their child's interest in real guns on a scale from 1 to 5: 1-2 = low interest, 3 = moderate interest, and 4-5 = high interest. Parents of an eligible child were asked to bring to the exercise 1 of their son's playmates and/or a sibling in the same age range. After informed parental consent was obtained, each pair or trio of boys was placed in a room with a 1-way mirror and observed for up to 15 minutes. Two water pistols and an actual .380 caliber handgun were concealed in separate drawers. The handgun contained a radio transmitter that activated a light whenever the trigger was depressed with sufficient force to discharge the firearm. After the exercise, each boy was asked whether he thought that the pistol was real or a toy. Before leaving, each child was counseled about safe behavior around guns.

Results. Twenty-nine groups of boys ($n = 64$) took part in the study. The mean age of participants was 9.8 years. Twenty-one of the groups (72%) discovered the handgun ($n = 48$ boys); 16 groups (76%) handled it ($n = 30$ boys). One or more members in 10 of the groups (48%) pulled the trigger ($n = 16$ boys). Approximately half of the 48 boys who found the gun thought that it was a toy or were unsure whether it was real. Parental estimates of their child's interest in guns did not predict actual behavior on finding the handgun. Boys who were believed to have a low interest in real guns were as likely to handle the handgun or pull the trigger as boys who were perceived to have a moderate or high interest in guns.

More than 90% of the boys who handled the gun or pulled the trigger reported that they had previously received some sort of gun safety instruction.

Conclusion. Many 8- to 12-year-old boys will handle a handgun if they find one. Guns that are kept in homes should be stored in a manner that renders them inaccessible to children. *Pediatrics* 2001;107:1247-1250; *guns, weapons, firearms, children, childhood behavior, injury prevention.*

Unintentional firearm injuries kill ~400 children (0-19 years old) each year, and >3000 children sustain nonfatal injuries.¹⁻³ Eighty percent of these shootings involve males, and many incidents occur when a child discovers a gun in the home while playing with a friend or a sibling.⁴⁻⁹ Approximately 40% of American households contain 1 or more firearms.¹⁰⁻¹² Despite the risk of unintentional discharge and other adverse incidents, as many as 13% of gun-owning families keep at least 1 gun loaded and unlocked.^{11,13} This is especially true when the weapon is kept for protection.¹⁴⁻²⁰

Growing concern about childhood firearm injuries has prompted the American Academy of Pediatrics to stress the importance of educating parents about the need to remove firearms from their home or at least secure them in a proper manner (locked and unloaded) and encouraging parents to teach young children safe behavior around guns.²¹⁻²³ Despite widespread appreciation of the importance of gun safety, there is limited research on what children do when they encounter a real gun.²⁴

Many parents may have unrealistic expectations of their children's behavior around guns.^{13,25} In a survey of ~400 parents in metropolitan Atlanta, 28% of parents who had children between 4 and 12 years of age reported owning at least one firearm. Three fourths (74%) of gun-owning parents believed that their 4- to 12-year-old child could tell the difference between a toy and a real gun, and approximately 1 in 4 (23%) stated that their child (median = 9 years old) could be trusted with a loaded gun. Of all parents surveyed, 74% believed that their child would either leave a gun alone or go tell an adult if they found a gun.¹³ To determine whether this degree of confidence was justified, we conducted a study to determine how children behave when they discover a real handgun while playing.

METHODS

Our study was approved by the Human Investigations Committee of the Emory University School of Medicine. Participants were recruited from families that completed a survey about fire-

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arm ownership and storage in ambulatory care centers¹³ and a children's hospital emergency department. This was a convenience sampling of families with boys between 8 and 12 years of age. During the recruiting process, parents were informed in detail about the nature of the study and were asked not to inform or instruct their child before participation. A monetary incentive of \$25 per child was offered to encourage participation.

Parents who agreed to participate in this study were asked to rate their child's level of interest in real guns on a scale from 1 to 5 (1 = no interest; 5 = very interested). To replicate the dynamics of children at play, we asked parents who were willing to permit their child to participate to recruit a male sibling of the same age range or 1 to 2 of their son's playmates and their respective parent(s). We restricted our participants to boys who were 8 to 12 years old because this is a high-risk group for unintentional firearm injury, and many of the gun-owning parents who completed our earlier survey indicated that they believed that their child could be trusted with a loaded gun at this age.^{3,13}

After obtaining informed parental consent for every participating child, we placed each pair or trio of boys in an examination room of an outpatient clinic for a maximum of 15 minutes. This room contained a 1-way mirror behind which the parents and the principal investigator (G.A.J.) observed the children. At the time they were led into the room, the children were told that they could play with the toys that were placed on the counter. They also were told that they could exit the room at any time if they had any questions or problems. They were not told to explore the room or to open any cabinets.

Within the examination room, 2 brightly colored plastic water pistols were concealed in 1 drawer. An actual metal .380 caliber semiautomatic handgun was placed in another drawer. The handgun was modified so that it could not fire. Inside the magazine, the handgun contained a radio transmitter that activated a flashing light only when the trigger was depressed with sufficient force to discharge the weapon. The light was visible only to observers who were positioned behind the 1-way mirror as the light was located in the observation room. This allowed us to distinguish reliably the children who pulled the trigger from those who only handled the gun.

Each group was evaluated for 4 discrete behaviors. These were whether they found the gun (yes/no) and, if so, whether they left the room to tell an adult (yes/no). Those who did not leave the room were observed to determine whether they handled the gun (yes/no) and/or pulled the trigger (yes/no). These behaviors were recorded by the principle investigator (G.A.J.) and confirmed by videotape.

After the exercise, each boy was questioned to determine whether he believed that the handgun was real or a toy. We also assessed each boy's general knowledge of guns and asked whether anyone had previously taught him gun safety. Before leaving the building, each boy and his parents received counseling about safe behavior around guns.

Data were stored in an *EPI Info, Version 6.0* database (Centers for Disease Control and Prevention, Atlanta, GA) and reported with the use of descriptive statistics.

RESULTS

Twenty-nine groups ($n = 64$ boys) took part in the study. The mean age of the boys was 9.8 years (range = 8 to 12 years). Twenty-one of the 64 boys (33%) were from gun-owning families. Sixty-three percent of the boys were white, 36% were black, and 1% was biracial.

Twenty-one of the 29 groups (72%) discovered the handgun. Only 1 of these 21 groups (5%) left the room to inform an adult about the handgun. In all, 16 of the 21 groups that found the gun (76%) handled it. One or more members of 10 of these 21 groups (48%) pulled the trigger (Fig 1).

Individually, 48 of the 64 children (75%) who participated in this study discovered the handgun. Of these 48 boys, 30 (63%) handled the gun and 16 (33%) actually pulled the trigger. Seventeen of the 48 boys who handled the gun (35%) and 6 of the 16 boys who

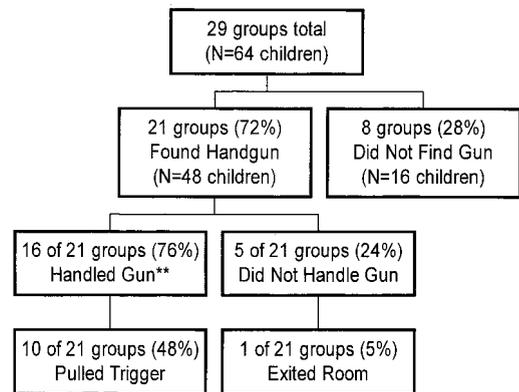


Fig. 1. Observed behavior, group analysis. **Three groups that exited the room handled the gun before leaving to tell an adult.

pulled the trigger (38%) were from gun-owning families (Table 1). Approximately half of the boys (48%) who found the gun thought that it was a toy or were unsure whether it was real. Twenty-eight of the 30 boys (93%) who handled the gun and 15 of 16 (94%) who pulled the trigger reported that they had previously received some sort of gun safety instruction. The nature of the safety instruction taught to the boys varied from police officers to teachers to informal instruction by family members.

On the basis of the surveys collected before the exercise, parents of 6 of the 48 boys (13%) who found the gun believed that their son had a high interest in firearms (score = 4 or 5 on the 5-point scale). Nine boys (19%) were perceived to have a moderate interest in real guns (score = 3). However, parents of 31 of the 48 boys (64%) thought that their son had a low interest in real guns (score = 1 or 2). A parent of 2 boys (4%) was "unsure" of her sons' levels of interest in real guns.

Two of the 6 boys (33%) who were perceived to have a high interest in real guns handled the gun, compared with 7 of 9 boys (78%) who were perceived to have a moderate interest. Twenty of the 31 boys (65%) who were perceived to have a low interest in real guns handled the gun. Two of the 6 boys (33%) who were perceived to have a high interest, 3 of the 9 boys (33%) who were perceived to have a moderate interest, and 11 of the 31 boys (35%) who were perceived to have a low interest in real guns actually pulled the trigger.

A few anecdotes serve to illustrate the range of behaviors that we observed. A 9-year-old who pulled the trigger was able to dismantle and reassemble the handgun during the 15 minutes in the examination

TABLE 1. Observed Individual Behavior and Family Gun Ownership

Parameter	Gun Owning	Non-Gun Owning
Individual children (N = 64)	21/64 (33%)	43/64 (67%)
Children who found gun (N = 48)	17/48 (35%)	31/48 (65%)
Children who handled gun (N = 30)	12/30 (40%)	18/30 (60%)
Children who pulled trigger (N = 16)	6/16 (38%)	10/16 (63%)

room. He did not come from a gun-owning family. Another 9-year-old who had depressed the trigger stated that he thought that the handgun was a toy because it didn't look like his dad's gun. Yet another 9-year-old repeatedly tried to pick up the gun but was thwarted each time by his 11- and 12-year-old siblings. A 12-year-old picked up the handgun and pointed it directly at his friend's chest but did not depress the trigger. He then placed the gun back in the drawer and left the room to ask whether the gun was real. In 1 group that consisted of 3 boys (all 9 or 10 years old), a single child left the room to ask about the gun's authenticity without allowing the other 2 boys to touch the gun. Although they refrained from touching the gun, the other 2 children repeatedly mocked him because they thought that the gun was a toy.

DISCUSSION

Almost three fourths of the groups that we tested found the handgun within 15 minutes of being placed in the room. More than three fourths of the groups that found the gun handled it. Approximately half of the groups that handled the gun pulled the trigger with enough force to discharge the weapon. Approximately half of the 8- to 12-year-old boys who found the handgun were unsure whether it was real or a toy. Some who realized it as an actual handgun played with it anyway, including several who pulled the trigger.

Children from gun-owning families were no more or less likely to handle the weapon or to pull the trigger than children from non-gun-owning families. We also found that parents' perception of their son's interest in real guns did not predict the child's behavior on finding a handgun. Remarkably, >90% of the boys who handled the gun or pulled the trigger reported having previously received some sort of gun safety instruction, ranging from an informal talk with their parents to formal instruction from a teacher or a police officer at school.

These findings contradict the beliefs and practices of many gun-owning parents.^{13,25} Surveys suggest that as many as 61% of gun-owning households with children store at least 1 firearm unlocked and/or loaded.^{19,25,26} In an earlier study by our group, 23% of a sample of gun-owning parents reported that they would trust their 4- to 12-year-old child with a loaded firearm.¹³ Our study suggests that most 8- to 12-year-old boys will not refrain from handling a handgun if they encounter one outside the immediate supervision of an adult. Such settings could include a parent's bedroom, the home of a playmate, or even under a bush in a neighborhood.

Our study is limited in important respects. First, it is based on a convenience sample of young boys. Although our group included both Caucasian, non-Hispanic and African-American boys, it may not be representative of the range of behaviors that could be observed among a random and more geographically dispersed sample of 8- to 12 year-old boys. Second, although the study was conducted in an examination room rather than in an actual home, the environment that we used was safe. The children whom we tested

might reasonably assume that the firearm therefore was safe as well. It can be argued, however, that a child who finds a gun at home or at a friend's house could make the same assumption because these settings presumably are safe as well. Third, we did not attempt to determine whether the gun was pointing at anyone when the trigger was depressed, because this was difficult to judge; we considered pulling the trigger at any time to be a high-risk behavior. Fourth, there is a possibility that some children may have stated that the gun was a toy although they knew it to be real, to avoid potential repercussions from their parents. However, these children still exhibited high-risk behavior around a handgun. Finally, this pilot study involved a relatively small number of participants. A definitive study would require testing a larger number of children in a variety of settings.

Strategies to reduce the risk of unintentional gunshot firearm injuries of children can be grouped under the 3 "E's" of injury control: education, enforcement of safety regulations, and engineering.^{3,27} First, parents should be educated about the hazards of keeping firearms in the home, especially those that are stored improperly. In an educational brochure for parents entitled "Keep Your Family Safe From Firearm Injury," the American Academy of Pediatrics offers parents the following advice: "Because even the most well-behaved children are curious by nature and will eagerly explore their environment, the safest thing to do is not keep a gun at home." In a more recent policy statement, the American Academy of Pediatrics stated, "The most effective measure to prevent firearm-related injuries to children and adolescents is the absence of guns from homes and communities. Firearm regulation, to include bans on handguns and assault weapons, is the most effective way to reduce firearm-related injuries."²¹ Parents who are unwilling or unable to remove guns from their home should be urged to secure their firearms in a manner that renders the weapons inaccessible to children (ie, locked and unloaded).^{21,22,28}

Second, efforts should be made to teach children never to touch a real gun without adult supervision and to tell an adult if they find one. The National Rifle Association's "Eddie Eagle" gun accident prevention program contains the common-sense message, "STOP! Don't touch. Leave the area. Tell an adult." Although this program has been promoted heavily, it never has been evaluated formally to prove that it works. If gun safety education gives parents a sense of complacency without fundamentally altering child behavior, then it might do more harm than good. That many of our 8- to 12-year-old boys could not distinguish a real gun from a toy suggests that the goal of teaching young children to behave safely around real guns may be difficult to achieve.²⁴

Third, several states have enacted laws that hold adults legally responsible for injuries caused by their firearms. Enactment of laws that permit felony prosecution of violators has been linked to a 23% reduction in unintended shooting deaths of children younger than 15 years.²⁹ It is unclear, however, whether laws of this sort alter gun storage practices

or whether the decline in unintentional firearm deaths is sustained over time.

Finally, it should be possible to make safer handguns.^{27,30} Although handguns account for fewer than half of all new gun sales, this type of weapon is involved in ~85% of fatal and nonfatal firearm injuries in metropolitan counties.³¹ Most of the handgun models that are manufactured domestically or imported into the United States lack safety features to prevent unintended discharge (Hargarten S, Milne J, Kellermann A, Wintemute G, unpublished data). Fully 88% of respondents to a National Opinion Research Center survey, including 80% of responding gun owners, supported the notion that all new handguns sold in the United States should be required to be childproof. This study also found that 71% of respondents supported the requirement that all new handguns be personalized.³²

CONCLUSION

Our results suggest that 8- to 12-year-old boys cannot be trusted to refrain from handling a handgun if they encounter one outside the immediate supervision of an adult. It is incumbent on adults to ensure that the environments in which children play are reasonably safe from harm. This must include, at a minimum, storing the firearms in a manner that renders them inaccessible to children.

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REFERENCES

- Centers for Disease Control and Prevention. *Firearm Mortality and Morbidity*. Atlanta, GA: Centers for Disease Control; 1986-1992
- Beaman V, Annett JL, Mercy JA, Kresnow MJ, Pollock DA. Lethality of firearm-related injuries in the United States population. *Ann Emerg Med*. 2000;35:258-266
- American Medical Association. *Physician Firearm Safety Guide*. Chicago, IL: American Medical Association; 1998
- Grossman DC, Reay D, Baker SA. Self-inflicted and unintentional firearm injuries among children and adolescents. *Arch Pediatr Adolesc Med*. 1999;153:875-878
- Harruff RC. So-called accidental firearm fatalities and teenagers in Tennessee, 1961-1988. *Am J Forensic Med Pathol*. 1992;13: 290-298
- Wintemute GJ, Teret SP, Kraus JF, Wright MA, Bradfield G. When children shoot children: 88 unintended deaths in California. *JAMA*. 1987;257:3107-3109
- Wintemute GJ, Kraus JF, Teret SP, Wright MA. Unintentional firearm deaths in California. *J Trauma*. 1989;29:457-461
- Morrow PL, Hudson P. Accidental firearm fatalities in North Carolina, 1976-1980. *Am J Public Health*. 1986;76:1120-1123
- Rushforth NB, Hirsch CS, Ford AB, Adelson L. Accidental firearm fatalities in a metropolitan county (1958-1973). *Am J Epidemiol*. 1975; 100:499-505
- Wiktor SZ, Gallaher MM, Baron RC, Watson ME, Sewell CM. Firearms in New Mexico. *West J Med*. 1994;161:137-139
- Senturia YD, Christoffel KK, Donovan M. Children's household exposure to guns: a pediatric practice-based survey. *Pediatrics*. 1994;93: 469-475
- Cook PJ, Ludwig J. *Guns in America. Results of a Comprehensive National Survey on Firearm Ownership and Use*. Washington, DC: Police Foundation; 1996
- Farah M, Simon HK, Kellermann A. Firearms in the home: parental perceptions. *Pediatrics*. 1999;104:1059-1063
- Kellermann AL, Reay D. Protection or Peril? An analysis of firearm related deaths in the home. *N Engl J Med*. 1986;314:1557-1560
- Stennies G, Ikeda R, Leadbetter S, Houston B, Sacks J. Firearm storage practices and children in the home, United States, 1994. *Arch Pediatr Adolesc Med*. 1999;153:586-590
- Lee RK, Harris MJ. Unintentional firearm injuries: the price of protection. *Am J Prev Med*. 1993;9(suppl 1):16-20
- Patterson PJ, Smith LR. Firearms in the home and child safety. *Am J Dis Child*. 1987;141:221-223
- Goldberg BW, Von Borstel ER, Dennis LK, Wall E. Firearm injury risk among primary care patients. *J Fam Pract*. 1995;41:158-62
- Senturia YD, Christoffel KK, Donovan M. Gun storage patterns in US homes with children. A pediatric practice-based survey. Pediatric Practice Research Group. *Arch Pediatr Adolesc Med*. 1996;150:265-269
- Christoffel KK, Naureckas SM. Firearm injuries in children and adolescents: epidemiology and preventive approaches. *Curr Opin Pediatr*. 1994;6:519-524
- American Academy of Pediatrics. Firearm-related injuries affecting the pediatric population. Committee on Injury and Poison Prevention. *Pediatrics*. 2000;105:888-895
- American Academy of Pediatrics. *Injury Control for Children and Youth*. Elk Grove Village, IL: American Academy of Pediatrics; 1987:136-144
- STOP. Steps to Prevent Firearm Injury*. Washington, DC: American Academy of Pediatrics and Center to Prevent Handgun Violence; 1994
- Hardy MS, Armstrong FD, Martin BL, Strawn KN. A firearm safety program for children: they just can't say no. *J Dev Behav Pediatr*. 1996; 17:216-221
- Webster DW, Wilson MEH, Duggan AK, Pakula LC. Parents' beliefs about preventing gun injuries to children. *Pediatrics*. 1992;89:908-914
- Becher EC, Christakis NA. Firearm injury counseling: are we missing the mark? *Pediatrics*. 1999;104:530-534
- Karlson TA, Hargarten SW. *Reducing Firearm Injury and Death: A Public Health Sourcebook on Guns*. New Brunswick, NJ: Rutgers; 1997
- Wilson MH, Baker SP, Teret SP, Garbarino J, Shock S. *Making Children Safe: A Guide for Decision Makers*. New York, NY: Oxford University Press; 1991
- Cummings P, Grossman DC, Rivara FP, Koepsell TD. State gun safe storage laws and child mortality due to firearms. *JAMA*. 1997;278: 1084-1086
- Marwick C. A public health approach to making guns safer. *JAMA*. 1995;273:1743-1744
- Kellermann AL, Rivara FP, Lee RK, et al. Injuries due to firearms in three cities. *N Engl J Med*. 1996;335:1438-1444
- Teret SP, Webster DW, Vernick JS, et al. Support for new policies to regulate firearms: results of two national surveys. *N Engl J Med*. 1998; 339:813-818

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