

*PEER TUTORING TO PREVENT FIREARM PLAY: ACQUISITION,  
GENERALIZATION, AND LONG-TERM MAINTENANCE OF  
SAFETY SKILLS*

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Hundreds of accidental injuries and deaths to children occur annually in the United States as a result of firearm play. Behavioral skills training (BST) and in situ training have been found to be effective in teaching children the skills to use if they find a firearm, but training requires substantial time and effort. The current study examined the use of peers as tutors as a potential way to decrease the time and resources needed to teach these safety skills to youngsters. Peer trainers conducted BST and in situ training with other children. Children taught by the peer trainers acquired the safety skills and demonstrated them in naturalistic situations in which the skills were needed. Furthermore, all of the peer trainers acquired and maintained the skills. These results support the use of peer tutoring for teaching safety skills to other children.

DESCRIPTORS: behavioral skills training, firearm injury, in situ training, peer tutoring, safety skills

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Hundreds of American children are killed or injured each year in firearm accidents. Many of these casualties are the consequence of children playing with firearms they have found in the home (e.g., Eber, Annest, Mercy, & Ryan, 2004). Thus, interventions aimed at children should teach skills to prevent gun play. Investigations by Miltenberger and colleagues (Gatheridge et al., 2004; Himle, Miltenberger, Flessner, & Gatheridge, 2004; Himle, Miltenberger, Gatheridge, & Flessner, 2004; Miltenberger et al., 2004, 2005) have demonstrated the success of behavioral skills training (BST) and in situ training in teaching children these safety skills. Although these methods are effective, their implementation takes extensive time and trainer resources. Consequently, these programs are not practical for teaching large numbers of children. The use of peers as tutors has the potential to make safety skills training programs accessible to more children.

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Peer tutoring has been used to deliver instruction in a variety of areas, including academic, social, and behavioral skills (e.g., Anhalt, McNeil, & Bahl, 1998; Flood, Wilder, Flood, & Masuda, 2002; Fueyo & Bushell, 1998; Gumpel & Frank, 1999; Pigott, Fantuzzo, & Clement, 1986; Trovato & Bucher, 1980). The positive results demonstrated in the literature have clear implications for the use of peer tutoring to teach skills to children to prevent firearm injury. If a teacher trains a few children who in turn train many peers, more children will receive training. The current study investigated the use of peer trainers to teach children the skills needed to prevent firearm play.

The four goals of the present study were (a) to teach children to train other children in firearm safety skills; (b) to demonstrate the acquisition of the skills by the children taught by peer trainers; (c) to demonstrate the maintenance of the skills in the peer trainers; and (d) to assess the long-term effects of training.

## METHOD

### *Participants and Settings*

Six 6- and 7-year-old children were recruited from a local day-care and afterschool program

to serve as peer trainers. Six 4- and 5-year-old children, hereafter called the students, were recruited to be tutored by the peer trainers. Training sessions and assessments were conducted at various sites within the facility (e.g., in a classroom, in the hallway, in the director's office). Additional assessments were conducted with parental permission at the children's homes as a measure of generalization.

#### *Materials, Target Behaviors, Assessment, and Interobserver Agreement*

Four disabled handguns were provided for research purposes by the local police department and were used for assessment of the children's skills. An exact replica of a handgun made of plastic was used in peer-directed training sessions. The participants' responses when finding a gun were coded on a scale from 0 to 3 as follows: 0 = *the participant touched the firearm*; 1 = *the participant did not touch the firearm*; 2 = *the participant did not handle the firearm and left the area within 10 s*; and 3 = *the participant did not touch the firearm, left the area, and immediately reported the firearm to an adult*. In the in situ assessments, the researcher set up a situation in which the participant found a firearm in his or her natural environment while alone and was unaware that assessment was occurring. For example, a gun was placed near drawing materials, and the child was asked to sit at the table and color a picture as the teachers talked outside the room.

The researcher conducted the assessment, and the teacher or parent served as the observer. The observer noted whether the child saw the gun. If a child did not see the gun, the assessment was not scored and another assessment was conducted at a later time. At least one third of assessments across baseline and training phases were videotaped, and the responses were scored independently by trained observers. Interobserver agreement was calculated by dividing the number of agreements (i.e., the number of responses assigned the same score by both observers) by the summed number of

agreements and disagreements multiplied by 100%. Mean agreement was 97%.

#### *Procedure*

Peer trainers and students were assessed prior to training. Following baseline assessment, the peer trainers were trained by the researcher to teach the safety skills to students using BST. Following training by the researcher, peer trainers were assessed in a naturalistic situation (in situ assessment). After demonstrating competence (a score of 3), the peer trainers used BST techniques to train students. The students were assessed throughout training to measure the acquisition and maintenance of the safety skills. Students received two initial training sessions and up to three booster sessions following failed assessments (a score of less than 3). If students did not perform the safety skills in a subsequent assessment, their peer trainer conducted in situ training. After conducting BST with students, the peer trainers were reassessed. The students experienced a number of follow-up in situ assessments up to 12 months following training.

*Baseline.* Baseline was the same for trainers and students. The researchers contrived situations such that each participant found a firearm in his or her natural environment while alone. Participants were not debriefed following assessments.

*BST (trainers).* Trainers were taught in pairs as the researcher modeled a training session and one trainer mimicked her actions while the second trainer acted as the student. The researcher taught the peer trainer to talk briefly to the student about the dangers of firearms and to tell the student what to do if he or she ever finds a gun (i.e., "Stop. Don't touch. Leave the area. Tell an adult."). Next, the researcher taught the peer trainer to model the safety behaviors for the student. The researcher placed a replica firearm in the room, approached it, and demonstrated the safety behaviors while describing her actions. The peer trainer then had the opportunity to model the safety

behaviors for the student and provide praise and corrective feedback while the student performed the safety behaviors. Following the rehearsal of the chain of behaviors, the researcher taught the peer trainer to present several scenarios in which the student should perform the safety behaviors (e.g., finding a firearm in a classroom, finding a firearm on the playground, finding a firearm in the kitchen) and provide praise and corrective feedback contingent on the student's behavior.

The peer trainers rehearsed the training sessions until they could complete a simulated session without prompting from the researcher. The total time spent coaching each peer trainer to conduct BST sessions ranged from 90 to 115 min ( $M = 102.5$  min). The two trainers whose students required in situ training also received a 5-min practice session prior to the first assessment in which in situ training might be needed.

*BST (students).* Peer trainers taught students individually using the instruction, modeling, rehearsal, and feedback described above. Training sessions were videotaped or observed from a distance by a researcher to assess the fidelity of training implementation. All trainers conducted training according to the protocol.

*In situ training.* During in situ training, the trainer (until that time unseen by the student) interrupted a failed assessment (i.e., an assessment in which the student found a firearm but did not complete the chain of safety responses) and turned the assessment into a training session. The trainer provided corrective feedback on the student's performance and required the student to rehearse the skills five times.

## RESULTS

### *Peer Trainers*

Four of the 6 peer trainers touched a found firearm on at least one occasion during baseline assessments (Figure 1). Following BST for trainers (plus one in situ training session for Abby and Julia), peer trainers demonstrated the

safety skills correctly in naturalistic assessments and began training students. After student training had been completed, all 6 peer trainers demonstrated maintenance of the safety skills.

### *Students*

Student scores in baseline assessments ranged from 0 to 1, with 3 of the 6 students touching the firearm in at least half of their assessments (Figure 2). None of the students left the area in which the firearm was found (a score of 2) nor alerted an adult to its presence (a score of 3) during baseline. After two initial BST sessions and one to two booster sessions, 3 students (Kelly, Mike, and Gabe) achieved criterion responding (i.e., they performed the safety skills in in situ assessments on three consecutive occasions). The remaining 3 students (Chris, Erin, and Emma) achieved criterion responding following BST and two in situ training sessions conducted by the peer trainer. However, Chris failed to use the skills when assessed at home following peer in situ training. Although he refused to engage in in situ training with the researcher following the assessment, he nonetheless exhibited the skills in subsequent assessments, including an assessment at his home. Gabe failed to use the skills at his home during a follow-up assessment. After in situ training with the researcher, he performed the skills in a subsequent assessment at his home. Similarly, Emma received one in situ training session from the researcher when the skills failed to generalize to the home setting. She subsequently performed the skills in her home and in a location at the afterschool program not associated with training or assessment, demonstrating that in situ training in each situation was not necessary for the skills to generalize to a novel environment.

Maintenance of the safety behaviors was demonstrated by Gabe during his 3-month follow-up assessment, after which he moved and was not available for reassessment. Erin and Emma continued to use the safety skills when they found firearms 1 year after acquiring the

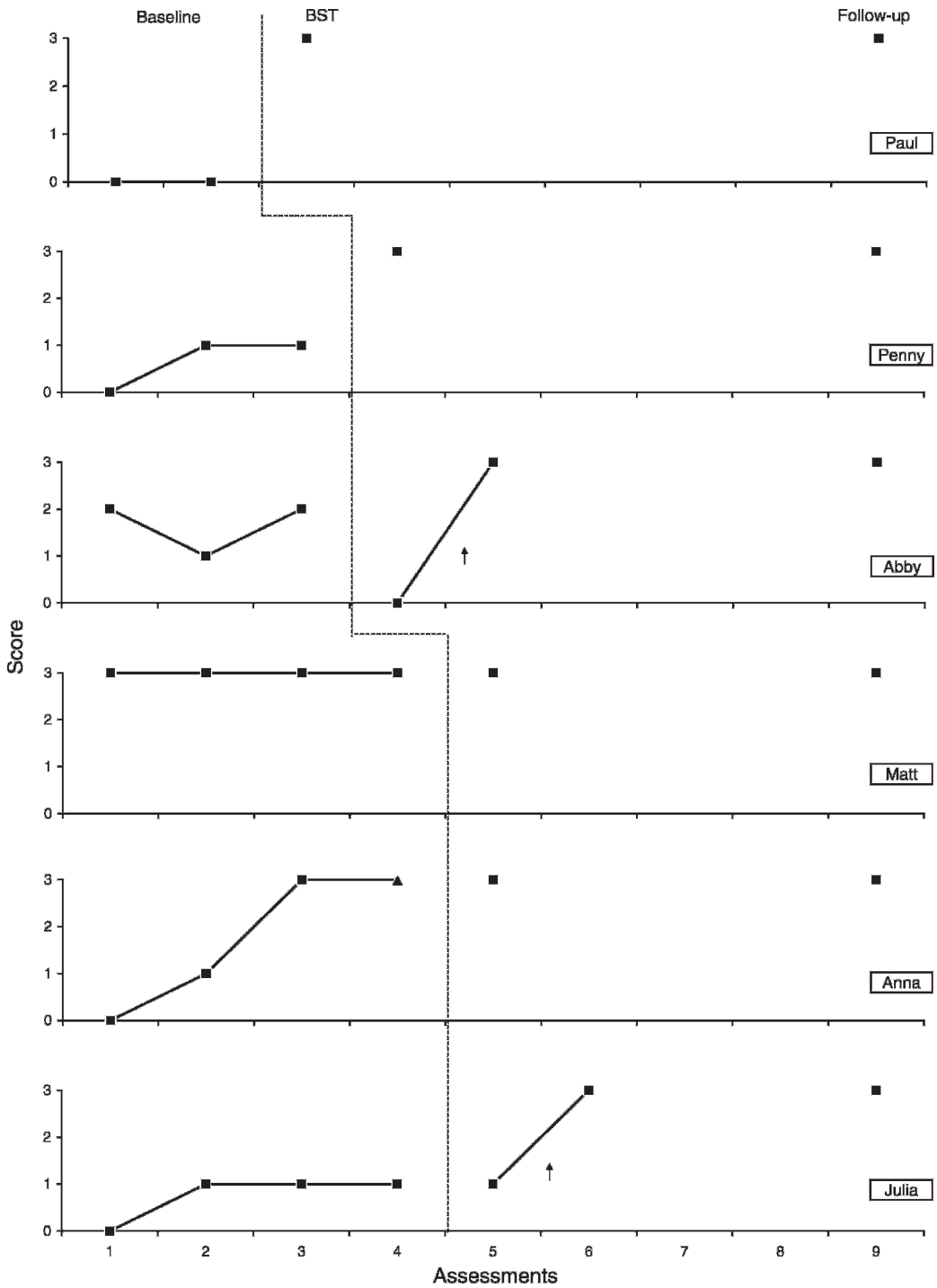


Figure 1. Trainer scores during baseline, behavioral skills training (BST), and following student training (0 = touched the firearm; 1 = did not touch the firearm; 2 = did not touch, left the area within 10 s; 3 = did not touch, left the area, told an adult). Squares indicate assessments at the day-care site, and triangles reflect home assessments. Upward arrows indicate in situ training conducted by the researcher.

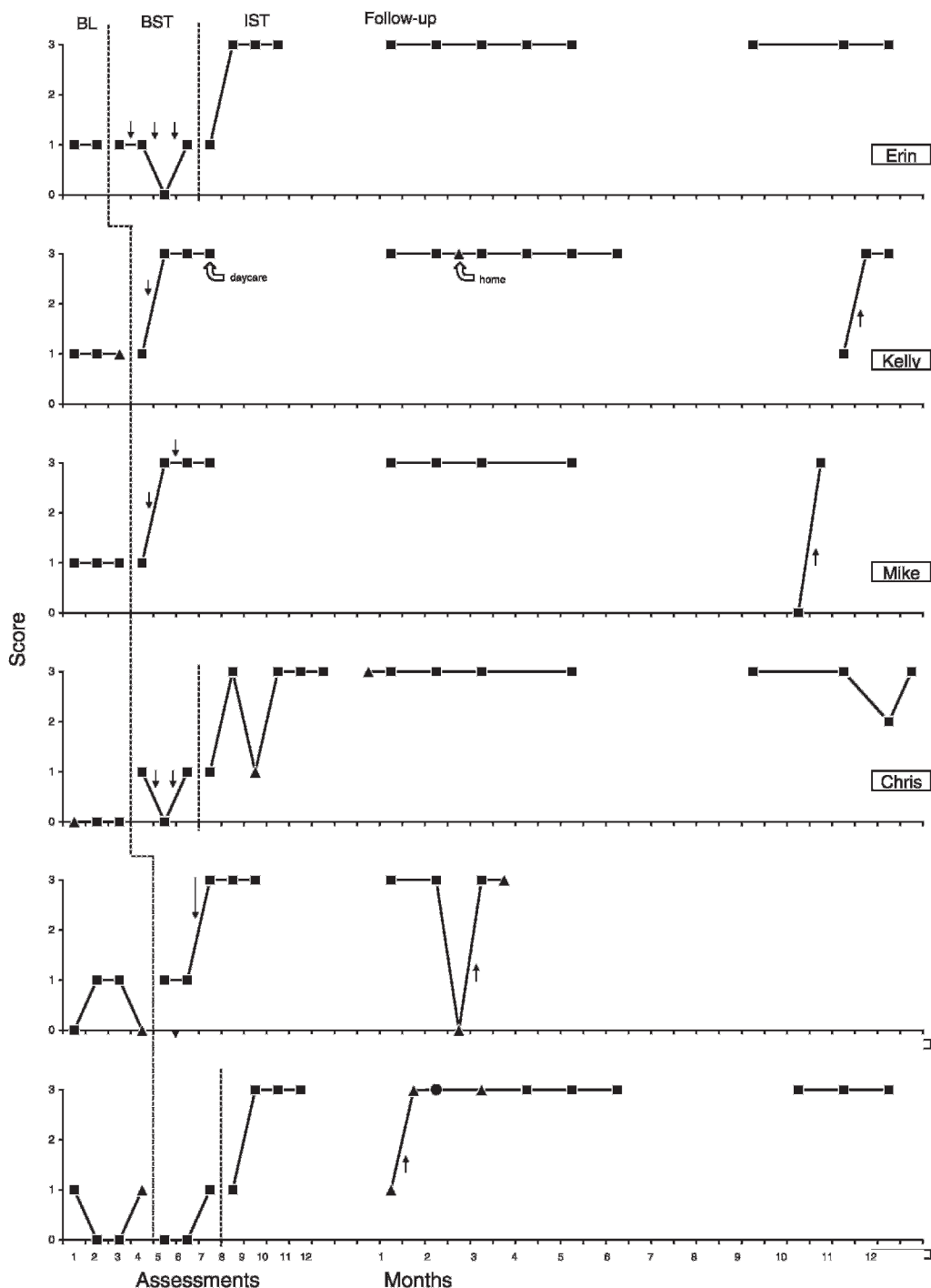


Figure 2. Student scores during baseline, behavioral skills training (BST), in situ training, and follow-up (0 = touched the firearm; 1 = did not touch the firearm; 2 = did not touch, left the area within 10 s; 3 = did not touch, left the area, told an adult). Squares indicate assessments at the day-care site, triangles reflect home assessments, and circle indicates a location at the day-care site not associated with training or assessment. Downward arrows indicate booster sessions conducted by the peer trainers. Upward arrows indicate in situ training conducted by the researcher.

skills. The skills were maintained at follow-up intervals of 5 to 11 months for the remaining 3 students, but failed to occur to criterion in a subsequent assessment. Kelly used the skills in her 6-month follow-up assessment but failed to leave the area within 10 s of finding the firearm during the 11-month follow-up assessment (a score of 1). Mike used the skills at the 5-month follow-up, but when he discovered a firearm during his 10-month follow-up assessment, he picked it up, turned it over, then quickly set it down, ran out of the room, and reported it to an adult (and thus received a score of 0). Chris engaged in the safety behaviors at the 11-month follow-up but during his 1-year follow-up, he failed to report the gun to an adult (a score of 2). Kelly, Mike, and Chris each received an in situ training session from the researcher and resumed the use of all of the skills in the next assessment.

## DISCUSSION

Notably, all 6 students acquired the safety skills through training conducted by a peer. The peer trainers were able to conduct BST and in situ training with little adult assistance with an initial investment of less than 2 hr. The results of the current study suggest that peer training has the potential to reduce the teacher time required to implement training, thus increasing the adoptability of behavioral safety skills training programs. Although the time required to train the peer trainers in the current study was not less than the time required to train individual children in previous studies, the trainers are now ready to provide training to many more students; thus, the efficiency would be manifest over time as the trainers trained additional students.

The results of this study show long-term maintenance of the safety skills for all students (at 3 to 11 months) as well as a subsequent failure of maintenance for some students. Although some of the children did not use the skills in later assessments (thus, the length of time the skills were maintained differed for each

child), it is important to note that all of the children used the skills when they found real firearms in their natural environments months after they were trained. This finding suggests that long-term assessment of skills is important to identify maintenance failures so that booster training can be programmed when needed.

The results from this study show that peer training produced effects similar to those produced by adult trainers (Himle, Miltenberger, Flessner, & Gatheridge, 2004; Miltenberger *et al.*, 2004). In research by Himle *et al.* and Miltenberger *et al.*, half of the 4- to 7-year-old participants acquired the skills with BST, whereas the others needed in situ training before they demonstrated the safety skills. In the current study, in situ training was required for half of the students as well.

Several limitations of the present study warrant attention. First, the short length and staggering of baselines may limit the ability of the design to demonstrate functional control. However, all 6 students evidenced stable responding during baseline and showed no evidence of skill acquisition prior to BST. Second, the skills failed to generalize to the home setting for 2 students (Emma and Gabe) until in situ training was conducted in that setting. Thus, peer training may not produce generalized responding in some cases. Finally, the skills were maintained longer for some children than others. It will be important to examine in future research the factors that contribute to the duration of skill maintenance.

Further research is needed to explore additional methods to increase the likelihood that more children will receive training (e.g., programs designed for parents). Development and evaluation of efficient and effective generalization programming also are needed to promote skill use in different situations without training in every environment. Finally, future research might evaluate occasional booster training sessions months after training as a method for sustaining skill use over long periods of time.

In conclusion, the four goals of the present study were attained. First, peer trainers successfully taught other children the safety skills to use when encountering a found firearm. Second, students trained by the peer trainers performed the skills when finding firearms in naturalistic situations. Third, the peer trainers demonstrated the skills when presented with novel firearms in nontraining situations. Fourth, follow-up data were obtained for more than a year, the longest follow-up period reported to date. The results of the current study are valuable in that they may enable modifications to behavioral safety skills training programs that will increase the efficiency and adoptability of those programs.

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