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ORIGINAL PAPER

Evaluating the Effectiveness of a Teaching Package Utilizing Behavioral Skills Training and In Situ Training to Teach Gun Safety Skills in a Preschool Classroom

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Abstract There are a number of different safety threats that children face in their lives. One infrequent, but highly dangerous situation a child can face is finding a firearm. Hundreds of children are injured or killed by firearms each year. Fortunately, behavioral skills training (BST) and in situ training (IST) are effective approaches for teaching a number of different skills, including safety skills. The purpose of this study was to evaluate a teaching package for preschool teachers to learn to conduct BST to teach safety skills. Following teacher-implemented BST, the experimenter completed in situ training and supplemental instructions. A multiple baseline across subjects design was used to evaluate the effectiveness of this teaching package implemented by the teacher and experimenter with five preschoolers. Five children demonstrated the skills following IST and additional reinforcement or time out. The use of additional reinforcement, as well as treatment fidelity are discussed.

Keywords Behavioral skills training · Gun safety skills · Class-wide approaches

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Introduction

Parents who are concerned with their children's safety often focus on safety skills, such as wearing a safety belt or using a car seat to promote car safety, storing hazardous materials out of reach of children to prevent poisoning, and teaching their children outdoor safety skills such as pedestrian skills to prevent accidents in roadways, and abduction safety skills to prevent their child from being abducted by strangers. Some parents do not immediately think of injury from playing with firearms as a major threat because it appears to occur infrequently. Unfortunately, hundreds of children are injured or killed each year by firearms when they find firearms in the home and play with them (Eber et al. 2004). Because of the injuries and deaths that result from playing with found firearms, behavior analysts have stepped into find an effective approach to teaching children the safety skills that could save children's lives (Himle and Miltenberger 2004).

One of the reasons that parents do not often think about the risk of firearm injury is that they may not believe their children are likely to find firearms. In a survey, 34 % of children reported that they live in a home with a gun. This represents more than 22 million children in 11 million homes. Among the homes with firearms, 40 % had at least one unlocked firearm, and 13 % of the homes stored their unlocked firearm either loaded or with ammunition (Schuster et al. 2000). With the accessibility to guns being so high, it is interesting to note that 72 % of parents reported that they thought their child was not likely to handle a gun without their permission ("Common Sense"). Studies have found that 70 % of Americans reported that they felt more had to be done to educate parents about the proper storage of guns to keep their children safe, and 80 % of Americans reported that more should be done to limit the access that children have to guns ("Common Sense"). In cases where parents were gun owners, they reported that the best way to prevent accidental shootings with guns is education (Knight-Bohnhoff and Harris 1998).

With such high accessibility to guns and the resulting instances of injuries and deaths with a firearm, there is no question that there needs to be an effective widespread approach to teaching children gun safety skills. Researchers have evaluated passive and active learning approaches to teaching safety skills to children. A passive learning approach (also called an information-based program) is an approach in which children are provided with information about safety threats and safety skills, but do not have a chance to practice the skills. An active learning approach is one in which children are not only told about the skills, but are also given the chance to practice these skills in role-plays and in situ assessments (Hardy et al. 1996; Himle et al. 2004b).

The Eddie Eagle GunSafe Program, a campaign designed by the National Rifle Association, is a widely adopted treatment package used to teach children safety skills. This passive learning program involves an instructor delivering instructions that in the event of finding a firearm, they should not touch it, immediately leave the area, and tell an adult. The package contains supplemental teaching aids such as coloring pages, posters, and a video. Himle et al. (2004b) and Gatheridge et al.

(2004) evaluated the Eddie Eagle program in a comparison with an active learning approach of behavioral skills training (BST, described below) and found that children receiving the Eddie Eagle training did not engage in the safety skills when a gun was found in an in situ assessment, or during role-plays; however, they were able to correctly describe the safety skills.

Behavioral skills training is an approach to teaching that has proven to be effective with many different skills. Previously, BST has been used to teach abduction prevention skills (Johnson et al. 2005; Johnson et al. 2006), poison recognition skills (Dancho et al. 2008), pedestrian safety skills (Sidman et al. 2005; Yeaton and Bailey 1978), sexual abuse prevention skills (Lumley et al. 1998; Miltenberger et al. 1999), and firearm safety skills (Himle et al. 2004a, b, Himle and Miltenberger 2004). BST utilizes delivery of instruction, modeling, role-plays, and specific feedback from instructors and in many instances, includes in situ assessment and training. BST is an active learning approach because children are given the chance to practice what they would do in a situation utilizing role-plays (Himle and Miltenberger 2004). In each of these studies, safety skills were assessed using in situ assessments.

In situ assessments for gun safety skills involve placing a realistic, but disabled firearm in a child's typical setting and evaluating the child's use of the skills upon finding the gun. During an in situ assessment, the child does not know that an assessment is taking place and goes to the assessment area for an activity. The child is observed by a video monitor, and the experimenter goes to the area once the assessment is completed. This allows for a naturalistic assessment of these skills. When a child completes these skills correctly, it will result in a report to the adult and the opportunity to receive praise for the use of the skills. In some cases, children do not complete the skills correctly. In this case, researchers are able to quickly intervene and give the child feedback on correct and incorrect responses; this is known as in situ training (IST). IST is similar in fashion to the rehearsal that children experienced in the role-play sessions, but it occurs immediately in the natural environment after the child failed to use the skills (Himle et al. 2004a; Miltenberger et al. 2004).

Early research focused on comparing BST with the popular Eddie Eagle approach. In this research, 4- to 5-year-old children were evaluated to determine whether they would engage in the safety skills following BST, Eddie Eagle training, or no training. The results of this study found that BST as well as the Eddie Eagle program were effective in teaching children to verbalize the correct responses. BST also effectively taught children to show the correct responses during supervised role-plays, whereas the Eddie Eagle program did not. However, children in both training groups failed to generalize the skills outside the training session during in situ assessments (Himle et al. 2004b). This research was important because it demonstrated that even after an active learning approach, children may not engage in the safety skills in other settings.

Following the failure of BST to result in generalized responding, Himle et al. (2004a) taught children gun safety skills in a BST approach; however, children who did not engage in the safety skills following BST participated in IST. Following the supplemental training, all children were able to demonstrate the safety skills. This

study spoke about the importance of IST in the occurrence of safety skills in naturalistic settings. Subsequent studies found that BST, including IST, resulted in maintenance of gun safety skills at 3-month follow-ups (Miltenberger et al. 2005).

Research has shown that BST and IST can be effective to teach safety skills. However, these approaches are time-intensive and require the presence of a trainer or graduate student with training in these procedures. One way BST may be more widely adopted may be to develop training materials that parents, teachers, or trained peers can use to learn to teach safety skills to their children (i.e., Jostad et al. 2008; Gross et al. 2007).

This study evaluated the effectiveness of a teaching program that used BST implemented by a teacher in a preschool classroom to teach gun safety skills. Following BST, all children took part in supplemental trainings with the experimenter including IST and IST with incentive to increase the demonstration of these skills. For one child, IST and time out was implemented.

Method

Participants and Setting

Participants included three boys and two girls who attended the same voluntary prekindergarten class for the morning. Informed consent was received for one teacher, and consent forms and information regarding the study were provided to all parents who had a child in that classroom. The experimenter was present for all parents to ask questions and sign consent forms at the preschool. Three children were removed from the study for various reasons: One child did not provide assent to come to sessions so we terminated sessions, and two children were not available to complete all phases of the study due to an accumulation of absences. All children were typically developing 4-year-olds (there were no reported developmental delays). Many of the children attending the preschool received services for low-income families, including funding for voluntary prekindergarten. The preschool was in a low socioeconomic area in an urban setting. All students who were in the selected classroom were eligible to participate in the study with parental consent. The first eight children who returned consent forms were selected for participation in the study.

The preschool had four classrooms, all of which had been organized to have centers associated with different activities. There was a dining area with three tables and chairs for students to eat meals and snacks. Outside, there were two separate playgrounds, each with various playground equipment including swings, slides, and jungle gyms.

The primary classroom where trainings and role-plays took place had several centers around the room including a block center, a reading center, a pretend kitchen center, and a puppet show center. There was also a reading area where children attended circle and story time. Assessments and ISTs took place in various areas based on availability as well increasing the number of settings in which each child

was assessed. Assessments always took place in different areas from the initial group BST sessions.

Materials

The teacher was given a teaching package that contained a training manual and role-play cards. The teaching manual contained a task analysis for the components of BST and implementation of BST to a group of children for gun safety skills. A task analysis was given for delivering instructions, conducting discussions with the children, modeling the skills for children, conducting role-plays with the role-play cards, and delivering corrective feedback. All materials were developed by the experimenter based on successful demonstrations of BST in the relevant literature. The teacher was allowed to read the manual for 2 days prior to the start of the training and had access to the manual during the training sessions. Before implementation of the procedures, the teacher met with the experimenter and had the opportunity to ask any questions and practice any skills.

Role-play cards, describing scenes in which a child finds a gun, were given to the teacher to use with the children during training. Forty-six role-plays were created by the researcher on small index cards with different locations, guns, and scenarios that the teacher chose for the children to practice the skills.

Disabled firearms, which cannot be fired or loaded with bullets (that were provided by a police department), were also used by the teacher and researcher. These disabled firearms, ranging in size and type, were used during all BST sessions, as well as, in situ assessments and IST sessions.

During in situ assessments, a video baby monitor was placed in the room along with the video camera. The video camera allowed real-time recording of the child's behavior, and the video baby monitor allowed immediate intervening by researchers during ISTs when necessary. Recorded videos were also used to record interobserver agreement. During outdoor observations, the experimenter watched while out of the child's view.

Target Behaviors and Assessment

The safety skills targeted during this intervention included: (a) not touching the firearm, (b) leaving the immediate area of the firearm, and (c) telling an adult about the found firearm. Touching the firearm was defined as any behavior that the child engaged in that resulted in contact with the firearm with either a body part or an object used by the child (e.g., a toy or a pencil). Leaving the area where the gun was found was defined as the child vacating the area within 10 s of seeing the firearm (orienting toward the firearm). Reporting the firearm to the adult was defined as the child voluntarily telling an adult that he or she had seen the firearm. A child scored a 0 if he or she touched a gun; 1 if he or she did not touch the gun but did not leave the area or tell an adult; 2 if he or she did not touch the gun and left the area but did not tell an adult; and a 3 if he or she did not touch the gun, left the area, and told an adult.

Assessments were conducted before and after BST and IST to assess whether the children demonstrated the safety skills in the presence of a firearm. The assessments were conducted in various areas of the preschool and outside (i.e., different classrooms, lunch rooms, or either playground) and with toys or activities present (i.e., coloring, animal toys, car toys, or play dough) with as much variation as possible, and based on availability of areas. Prior to the start of an assessment, the disabled firearm was placed in plain sight near the activity materials to ensure that the child saw it. A hidden video camera was also placed in the area in a location where the child's behaviors could be recorded, including whether he or she saw the firearm during the assessment. The child was told that he or she was going to do some activities with a researcher, who was introduced as a volunteer. The experimenter told the child to go to the area and start the activity or play, while she went to get another item. No other children were present during the assessment, and the child was left in the room for 1 min. If a child touched a firearm (a score of 0), or did not leave the area within one minute (a score of 1), the experimenter immediately went into the room and removed while not discussing the firearm. The child's behaviors were recorded on the safety rating scale. When assessments or demonstrations were not taking place, the gun was kept out of sight and safely in a bag.

Interobserver Agreement

Interobserver agreement (IOA) was calculated for three target behaviors by dividing the number of agreements by the number of agreements plus disagreements multiplied by 100. The percentage agreement was 100 %, conducted across 78 % of sessions for all children. IOA was 100 % for Aden across 68 % of sessions, 100 % for Kerry across 82 % of sessions, 100 % for Fallon across 76 % of sessions, 100 % for Aileen across 94 % of sessions, and 100 % for Rory across 70 % of sessions.

Procedure

The effectiveness of a teaching package to teach safety skills to the preschool children was evaluated using a multiple baseline across subjects research design.

Baseline

During baseline, each child participated in a minimum of three in situ assessments as described above. After the assessments, no feedback or training was provided. After 1 min, the researcher went in the room, removed the firearm without drawing attention to the firearm, and completed an activity for 10 min with the child.

Behavioral Skills Training

The researcher provided training materials before the teacher started the BST. The teacher was offered time to go over the materials, while the experimenter watched her classroom for her. The teacher declined this time and read over the materials

after work. The teacher had the materials for 2 days. Before starting BST, the researcher and the teacher completed a proficiency check. The teacher correctly answered all questions on the proficiency check scoring a 100 %, and praise was delivered for correct responses.

After the teacher scored a 100 % on the oral proficiency check, training was started with the first group of children that day. This training included a session of BST on two consecutive days with the teacher. During the first day of BST, the teacher discussed the dangers of touching a gun and provided instructions on what to do when a gun is found. After providing instructions, the teacher brought out one of the disabled firearms and demonstrated the correct steps of not touching the gun, leaving the area, and reporting it to an adult. The children practiced refraining from touching the gun, leaving the area, and then reporting the firearm to the teacher. The teacher delivered praise each time a correct response was displayed. In the event that the child engaged in an incorrect response, the teacher delivered corrective feedback that included instructions on the correct response and practicing the correct response. The child practiced until he or she demonstrated the three-step behavioral sequence.

The students then practiced the skills with the teacher using the role-play cards. During the role-plays, the teacher picked a scenario and read the card out loud to the child. The teacher then set up the role-play with students and had one child act out the skills of finding a gun. The teacher also included students to act as friends and parents in some situations so all children could actively be engaged. The teaching protocol called for each child to complete the role-plays correctly two times and for the teacher to deliver specific praise and corrective feedback if needed.

The second day consisted of the teacher reviewing the skills followed by more role-plays. The teaching protocol called for each child to complete the role-plays correctly four times and for the teacher to deliver specific praise and corrective feedback if needed. After both days of BST, post-training assessments were conducted. The second group of children started training a month after the first group of children completed trainings. Each BST training session was approximately 30 min.

In Situ Training

All children took part in IST after a failure to perform the skills after BST. These sessions started like a typical assessment; however, a researcher intervened after 1 min if the child did not leave and report the firearm (a score of 1), or if the child was observed touching the disabled firearm (a score of 0). The researcher went into the room, pointed out the firearm, and reviewed the correct skills that should have been used. The researcher then had the child practice the skills until the child demonstrated the skills correctly three consecutive times. After the child demonstrated the skills, praise was delivered and the researcher engaged in an activity with the child for 10 min.

In Situ Training and Incentive

All children took part in IST with incentive after failing to perform the skills after IST (group 1) or after BST (group 2). These sessions started like a typical assessment; however, a researcher intervened after 1 min if the child did not leave and report the firearm (a score of 1), or if the child was observed touching the disabled firearm (a score of 0). The researcher went into the room, pointed out the firearm, and reviewed the correct skills that should have been used. The researcher then had the child practice the skills for 10 min instead of attending the class playtime. After the child demonstrated the skills, the child was brought to the classroom with no access to the reinforcing leisure activity. If the child engaged in the skills correctly, the child was given the option to go outside and play or complete the activity that the child was originally offered. After the session, the child was told that if she "found something dangerous (such as a firearm) and told an adult she could go outside or do a special activity, but if she did not tell an adult she would have to practice being safe" and the child was brought back to the classroom. This procedure was designed to include positive reinforcement (playing with an experimenter outside or completing another leisure activity) as well as negative reinforcement (escape from extended adult-directed practice of safety skills). The contingency specifying statements were delivered following the previous BST or IST assessment from the following phase.

In Situ Training with Time Out

One child (Rory) took part in IST with time out after a failure to perform the skills after IST with incentive. It was hypothesized that the extra training time during IST may have been a preferred activity because of the access to the researcher's attention. These sessions started like a typical assessment; however, a researcher intervened after 1 min if the child did not leave and report the firearm or if the child was observed touching the disabled firearm. The researcher went into the room, pointed out the firearm, and reviewed the correct skills that should have been used. The child was then prompted to sit in a chair for 2 min, while the researcher did paperwork. After 2 min, training was continued and the researcher had the child practice the skills until the child demonstrated the skills correctly five consecutive times. After the child demonstrated the skills, the child was brought to the classroom. If the child engaged in the skills correctly, the child was given the option to go outside and play or complete the activity that the child was originally offered. After the session, the child was told that if the child "found something dangerous (such as a firearm) and told an adult he could go outside or do a special activity, but if he did not tell an adult he would have to practice being safe."

Treatment Fidelity

Teaching sessions conducted by the teacher were video-recorded, and researchers recorded from video whether the teacher carried out each of the steps listed in the teaching manual. The first day the steps that were checked to be completed included

if the teacher initiated conversations with the children, presented the dangers of playing with firearms, identified the target safety skills, modeled the target safety skills, had the children recite the skills verbally, and had the children role-play the skills twice with corrective feedback. The second day's steps were similar except each child was to role-play four times.

Results

Results showed that in baseline, none of the children engaged in the safety skills. All children received a score of 0 (touched the gun) or 1 (did not touch the gun but did not get away or tell). Furthermore, in assessments in which the children touched the gun, they touched the area around the trigger in 67 % of assessments, pointed it at themselves in 21 % of assessments, pointed it as if to shoot at an object in the room in 33 % of assessments, or pointed it at a person who happened to walk into the room for 13 % of assessment. These findings suggested that these children would have been at great risk of shooting themselves or someone else upon finding a gun.

Following baseline, scores did not improve for any of the children with BST conducted by the teacher. IST, conducted with two of the participants following BST, did not result in the successful use of the safety skills for any of the participants. Aden and Kerry each scored a 3 (did not touch the gun, got away, and told an adult) one time during IST, but there was no consistent increase in safety skills with IST.

Five of the participants received IST with incentive, and this approach was effective with four out of five children (Aden, Kerry, Aileen, and Fallon). During IST with incentive, Kerry completed the skills in every assessment and the skills maintained during follow-up. Aden was largely successful with IST with incentive, ending the phase with five consecutive scores of 3 and using the skills during follow-up. In this phase, when he received a score of <3, it was because he did not leave the area in the 10-s window to tell an adult (session 17) and because he touched the gun to move it away from the table before he ran away and told an adult (session 20). Thus, he received a score of 1 for waiting too long to run away and a 0 for touching the gun even though he executed the safety skills immediately after. Aileen completed the skills in every assessment in this phase, and Fallon demonstrated the skills correctly five consecutive times and maintained the skills during follow-up after failing in the first two assessments. In the first assessment, he attempted to put the gun away for the adult (and received a 0), and in the second assessment, he waited in the room for a researcher to come to report the gun (and thus received a 1).

Following IST with time out, Rory demonstrated all safety skills consistently. The safety skills also maintained during the follow-up assessments for all five of the participants who were available for follow-up (see Fig. 1). Although the mean scores were variable, by the end of the final phase all the IST with incentive or time out phase scored a 3 five consecutive times and maintained the skills at 2.5-week follow-ups.

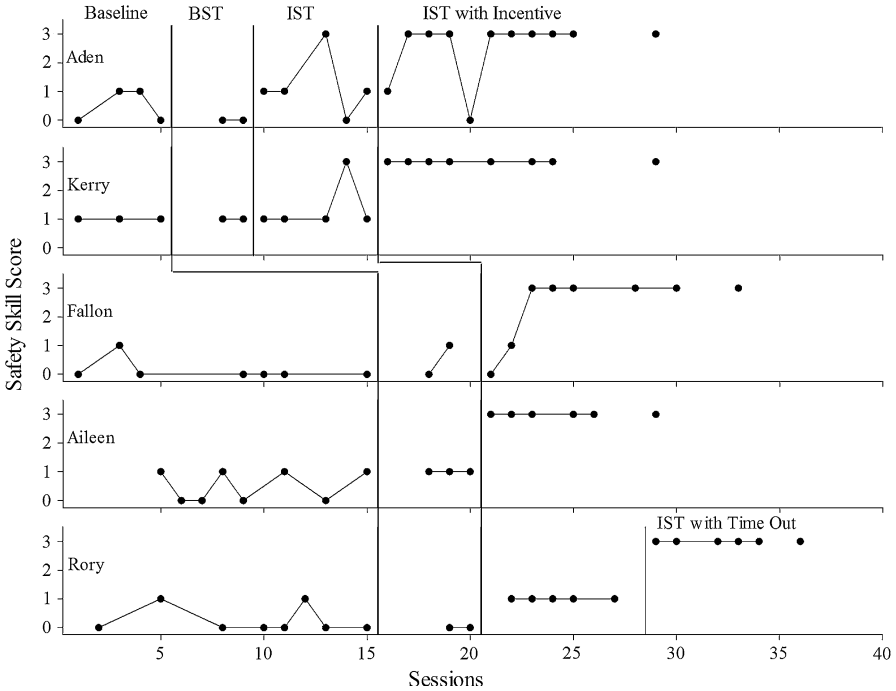

Fig. 1 Safety skills scores for in situ assessments for each participant in baseline and following behavioral skills training (BST), in situ training (IST), and IST with incentive or time out

Following training, the teacher's implementation of BST was scored from video. The teacher correctly implemented ten out of fourteen components of the training correctly (71 % correct). The teacher failed to correctly have each child role-play the specified number of times and did not deliver specific corrective feedback (in some instances, the teacher did not correctly tell the child what behaviors were correct, rather, she only pointed out what was done wrong or missing). It is hypothesized that the failure to implement the role-plays with higher integrity contributed to failure of children to use these skills. In situ training was the first time that participants were exposed to corrective feedback with the experimenter.

Discussion

The results of this study showed that BST implemented by a teacher was not effective alone in teaching safety skills to young children. Additionally, although it has been shown to be effective across many studies (Himle et al. 2004a; Johnson et al. 2005, 2006; Miltenberger et al. 2004, 2005), IST was not effective in promoting the safety skills. However, four out of five children demonstrated the skills after IST with an enhanced incentives component, and the other child demonstrated the skills after IST with time out. Thus, it appears that the

motivational effects of IST were not sufficient for the participants in this study. Instead, IST had to be enhanced with positive and negative reinforcement (access to preferred activities and escape from further training) and in one case with negative punishment (time out for Rory).

It is interesting to note that Aden and Kerry both demonstrated the safety skills one time during IST; however, the skills did not maintain. In Vanselow and Hanley (2014), one participant did not respond to IST, and additional consequences were implemented with success. The failure of IST to produce consistent effects could be due to the fact that praise was not acting as a strong enough reinforcer, and that getting caught not using the safety skills did not function as an aversive event. Furthermore, during the IST phase, the session always ended with a reinforcing activity; this access to the activity may have competed with the effects of praise provided contingent on the use of the safety skills. In the IST with incentive condition, there was no access to the reinforcing activity if the child failed to exhibit the safety skills. Rather, contingent on the use of safety skills, the child was given praise and the choice to go outside or do a reinforcing activity. It is hypothesized that access to the activity served as a reinforcer for completing the safety skills, and the loss of playtime served as a punisher for engaging in incorrect behaviors during the assessment.

In the second training group, Fallon, Aileen, and Rory all failed to use the skills after BST. Because IST was ineffective for the first group, these participants skipped IST and went into the IST with incentive phase after the BST phase. Rory failed to use the skills during the IST with incentive condition. It was hypothesized that the extra rehearsal he engaged in was a preferred activity and possibly reinforcing Rory's incorrect responses during assessments. During IST, Rory often yelled, ran around, and laughed seemingly to obtain attention, an observation corroborated by his teacher. Based on the hypothesis that Rory's failure to use the safety skills during assessments amounted to increased attention, it was decided to implement a short time out contingent on incorrect behavior during assessments. These changes lead to an immediate increase in the use of the safety skills. A limitation of the current study is that this procedure was put in place for only one participant. Future research may want to replicate these procedures with other children who do not respond to IST alone.

In published research on teaching safety skills to young children, BST has been shown to be effective about half the time, with IST needed half the time (Himle et al. 2004a; Miltenberger et al. 2004). One unanswered question in the current study is why BST did not work for these children. A possible reason may be the treatment fidelity of the implementation of the training. BST relies heavily on role-plays and feedback, but unfortunately these components were not implemented consistently for the children. The teacher scored 100 % on the verbal proficiency, but did not generalize the skills to the training of the children with great fidelity. Although lack of a high level of treatment fidelity could have been a factor in the failure of BST, it is unlikely that this was the only factor as IST also failed to increase the safety skills.

The failure of IST for all five children in this study was surprising, considering the widespread effectiveness of IST in the literature (Himle et al. 2004a; Johnson

et al. 2005, 2006; Miltenberger et al. 2004, 2005). There are several reasons why IST may not have been effective. One reason could be that the extra practice (and thus the attention from the researcher) the children received during IST may have served as a reinforcer for incorrect responding during assessments. In particular, it was hypothesized that for Rory, the extra attention during one-on-one training may have served as a reinforcer, and the successful use of a time out component demonstrated that this might have been the case. Also, being caught finding a firearm by the researcher and being made to practice during IST may not have been an aversive event for the children. In previous research, the act of being caught with a firearm and repeatedly practicing the skill likely functioned as an aversive event and thus functioned as a punisher for the inappropriate behaviors (Miltenberger et al. 2004). Furthermore, engaging in the correct behavior in subsequent assessments was probably reinforced by avoiding further practice. It is possible that disapproval of the researcher and repeated practice during IST was not a powerful aversive event for the children.

These children all attended voluntary prekindergarten in a lower socioeconomic area. It was beneficial for these kids to learn the skills because they may be more likely than a child in an upper SES area to find a firearm in their environment (Vacha and McLaughlin 2004). The preschool director and the teacher both reported that they worried about the children finding guns in their environments, and they both thought that these were important skills for the children to learn. Also, during IST, Aden reported that his father let him touch firearms in their home. Thus, it may be that he was desensitized to their presence, making training particularly important for him. In this study, we assessed the occurrence of safety skills in other settings from which training took place, including other areas of the school, as well as outside the school building in playgrounds. The use of safety skills was not assessed in other settings, such as the student's home or other community areas. Future research may want to assess the use of these skills outside the class in which training was conducted, as well as the potential role that parents may play in training procedures.

It was an important finding that with IST and enhanced reinforcement, the children used the skills. The teacher had reported that she previously reprimanded the kids for playing with toy guns. This was not effective in teaching the children not to play with guns, as demonstrated by their baseline scores. With a more potent reinforcer, the children demonstrated the skills. Prior to the study, the teacher and the director of the preschool did not believe that the children would be able to correctly demonstrate the skills. It was beneficial for the teachers to see that the children could be taught these skills with a more active learning approach and potent reinforcement.

The second group did not go through IST alone following BST for two main reasons. One reason was to control for sequence effects. Going from the BST phase to IST with incentive demonstrated that the children did not need to have IST prior to IST with incentive for the skills to be effectively taught. Also, the second group did not take part in IST alone because it was ineffective for the first group and skipping that phase allowed for faster completion of a training approach that was effective in teaching the skills.

There are limitations to the present study. One main limitation is that the failure to engage in the correct behaviors following BST and IST cannot be clearly explained; rather explanations can only be hypothesized as described above. Another limitation to this study is the treatment fidelity of BST by the teacher. The aim of the study was to evaluate a self-contained, cost-effective training package that could be used to teach safety skills without any assistance from the researchers. It was the goal to use a model that closely resembles how schools may access training materials under typical conditions (similar to Eddie Eagle or other curriculum purchases). This approach limited the amount of experimenter intervention in the BST phase, as teachers would ideally implement that phase alone. Further research should evaluate the extent to which treatment fidelity affects the performance of safety skills, and whether certain components are susceptible to lower treatment fidelity.

In this analysis, we saw that the instructional component was implemented with high fidelity; however, corrective and specific feedback was not implemented with high fidelity. Therefore, further research into this is warranted. The teaching package used by Gross et al. (2007) to teach parents to conduct BST and IST included a written manual and video modeling. Perhaps teachers would be more successful in teaching the skills if a similar video modeling component were included in their training materials. Although this intervention was delivered in a school setting, the classroom was small and future classroom-based interventions involving BST and IST would likely be delivered to larger groups. Therefore, understanding the necessary components of BST as well as identifying different variables that affect IST is necessary for the application of BST to groups of different sizes and implementers in different capacities (i.e., parents, teachers, and police officers). In this study, we only had the teacher conduct BST sessions; however, a researcher completed the assessments and following trainings. Future research may want to examine ways to train teachers and other caregivers to set up these assessments and further trainings.

Many parents rely on preschools and elementary schools to teach an array of safety skills, and it has been shown that passive learning approaches are not effective means to teach these skills (Gatheridge et al. 2004; Himle et al. 2004b). In the present study, both preschool staff and a parent expressed that they would like similar programs for other safety skills such as abduction prevention skills. Researchers in the area of school-implemented safety skill training should develop effective training programs that use BST for a variety of safety skills, as well as acceptability measures to assess the satisfaction of parents, teachers, and school administration.

Future research should also evaluate the effects of positive and negative reinforcement and the need for punishment during IST. The present study suggested that behaviors might change as a result of positive reinforcement (extra time outside and activities) and negative reinforcement (escaping extra practice). The current results also suggested that punishment (a time out procedure) was necessary for one participant. Researchers should further evaluate these components to identify their role in teaching safety skills to children.

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