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Evaluating Small-Scale Simulation Training for Teaching Firearm Safety to Children with ASD

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Evaluating Small-Scale Simulation Training for Teaching Firearm Safety to Children with ASD

by

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A thesis submitted in partial fulfillment
of the requirements for the degree of
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ABSTRACT

Every year children are unintentionally injured or killed due to finding an unattended firearm. Although research evaluating various approaches to teach safety skills shows that behavioral skills training and in situ training are effective, limited research exists evaluating small-scale simulation training in teaching safety skills to children. Furthermore, there is no research evaluating this approach with children with Autism Spectrum Disorder (ASD). This study evaluated the effectiveness of small-scale simulation training in teaching firearm safety to 5- to 6-year-old children with ASD. Simulation training was effective for one participant and in situ training was necessary for one participant. However, in situ training was not effective for the third participant.

CHAPTER ONE:

INTRODUCTION

Every year children are unintentionally hurt or killed by guns when they find an unattended firearm and shoot it, injuring themselves or another child. Fowler, Dahlberg, Haileyesus, and Annest (2015) found that children ages 0 to 14 caused 1,611 nonfatal firearm injuries and 396 fatal firearm injuries from 2010 to 2012. Furthermore, Hemenway and Solnick (2015) found that, in 16 states, 229 children under the age of 14 were unintentionally killed by guns from 2005 to 2012. The issue of children playing with guns and unintentionally harming themselves and their peers is costly. From the years 2001 to 2010, there were 198,969 emergency department visits by children due to firearm injury (Srinivasan, Mannix, & Lee, 2014). This accounts for part of the \$2.3 billion dollars spent every year for firearm injuries in the United States.

These injuries and deaths continue to occur because when children find guns, they play with them. Connor and Wesolowski (2003) conducted a telephone survey to determine how caregivers believed their children would respond to finding a gun. Of the 628 people surveyed, 87% reported that they believed that their child would not be in danger. However, this is not the case. Hardy, Armstrong, Martin, and Strawn (1996) found that kids will play with guns, even after they were just told to never touch a gun. This study also found that children cannot discriminate between a real and a fake gun, and they are more likely to believe a real gun is a toy. Additionally, Hardy (2002) found with a larger sample size of children, 53% of them

touched or played with a gun they found. Jackman, Farah, Kellermann, and Simon (2001) observed how groups of boys would behave when finding a gun. Of the 29 groups, 21 of them found the gun. Of those 21 groups, 16 groups, or 76%, handled the gun. Boys from ten of the groups actually pulled the trigger. Observations from these studies show that when kids are in the presence of a gun, they are very likely to play with it and potentially harm themselves or others. Due to these statistics, research has aimed to find solutions to prevent children from touching or playing with guns.

Research on teaching safety skills has used three types of assessment: self-report, role play, and in-situ. Self-report assessment involved an interviewer describing a novel situation involving a child finding a firearm (Himle, Miltenberger, Gatheridge, & Flessner, 2004). The child was asked how he or she would respond. Based on this response, he or she was scored based on a target response scale. During role play assessment, the researcher described a scenario and had the child act out what he or she would in response to finding a firearm. In situ assessments were also conducted. During this assessment, the participants were unaware that they were being assessed. A request was made to the participant that would lead to the child finding the gun. Once the participant completed the task and found the gun, safety skills were scored with the numerical value based on his or her response.

Although there are three types of assessment available, researchers found that in situ assessment is the only valid type because results of self-report and role-play assessments do not always correspond to the results of in situ assessments. For example, when a group of boys and girls was presented with a situation in which they found a gun, they could accurately describe what they would do (Gatheridge et al., 2004; Himle, Miltenberger, Gatheridge, et al., 2004; Kelso, Miltenberger, Waters, Egemo-Helm & Bagne, 2007). However, during in situ assessment,

when they actually found a gun in a similar situation, their actions did not correspond with what they said during self-report. Therefore, in situ assessment is the only valid form of assessment and was used in the following reviewed literature.

Research on teaching firearm safety skills has focused on both informational and active learning approaches. Informational approaches to prevent gun play among children involve providing children with information about why guns are dangerous and what to do when they find a gun. This can be done in a variety of ways such as having a police officer tell them to stay away or watching an informational video. Hardy (2002) evaluated activities provided by the Center to Prevent Handgun Violence. However, after participating in this week-long intervention, the participants showed no difference in gun play compared to the control group. Hardy et al. (1996) also evaluated an informational approach involving a police officer providing the children information on what to do when finding a gun. Again, they found no differences among the children who received the intervention and those who did not.

The Eddie Eagle GunSafe Program, another informational approach to prevent gun play, was designed by the National Rifle Association. This program emphasized the following steps upon finding a gun: stop, don't touch, leave the area, and tell an adult. Three studies evaluated this procedure across children of different ages (Gatheridge et al., 2004; Himle, Miltenberger, Gatheridge, et al., 2004; Kelso et al., 2007). Although after this intervention children did well during self-report assessments, most did not execute the skills during an in-situ assessment. Due to the participants' failure during in-situ assessment, the Eddie Eagle program was not shown to prevent gun play.

Morgan and Miltenberger (2017) evaluated video modeling as an intervention to prevent gun play. Of the three participants with autism, only one was able to execute the target behavior.

However, the safety skill was not maintained. This further demonstrates that informational approaches are not effective in teaching children to engage in safe responses when they find guns.

Active learning approaches involve behavioral skills training (BST) and in-situ training (IST). Behavioral skills training involves instructions, modeling, rehearsal, and feedback and is an effective teaching procedure for many children. When evaluating BST as an intervention for gun play prevention, three of eight 4- and 5- year old participants demonstrated the safety skills during in-situ assessment (Himle, Miltenberger, Flessner, & Gatheridge, 2004). Miltenberger et al. (2004) replicated this study with 6- and 7-year old participants, and again found that about half of the participants demonstrated the safety skills with BST. Further, they also maintained and generalized the target behavior. When BST is found to not be effective, IST is often tried as the next step to teach safety skills.

In-situ training involves catching the child in a situation failing to use the safety skills during an in-situ assessment and conducting BST on the spot. The researcher first shows the child what to do. The child then practices the skill in the situation until he or she can execute it independently. Research has demonstrated that when BST is not effective for teaching skills to a child, IST usually is effective. Of the remaining participants in the Himle, Miltenberger, Flessner, et al. (2004) and Miltenberger et al. (2004) studies that did not demonstrate the target behavior with BST, they did engage in the skills following IST. In-situ training takes place during an in-situ assessment if the participant fails to demonstrate the skill. Furthermore, Miltenberger et al. (2005) showed that 10 children quickly learned the target behavior following intervention combining BST and IST. The target behavior was maintained for at least 3 months, and children demonstrated the skill in the presence of a peer.

When informational approaches fail, IST has often been the only approach that is successful in teaching children safety skills. After attempting to use video modeling to teach gun play prevention to children with ASD, IST was an effective intervention (Morgan & Miltenberger, 2017). Again, after learning the behavior with IST, the participants maintained the skill. Researchers have found similar results when teaching other safety skills to children with autism; active learning approaches consisting of BST and IST are the most effective strategies (Gunby, Carr, & Leblanc, 2010; Gunby & Rapp, 2014; King & Miltenberger, 2017; Sanchez & Miltenberger, 2015)

Although BST and IST have received much attention, another form of teaching, small-scale simulation training, was also proven to be effective for teaching safety skills in one study (Maxfield, Miltenberger, & Novotny, in press). Simulation training simulates stimuli from the natural environment to the training environment, allowing the participants to respond to the stimuli in the training environment as they would in the natural environment (Thornton & Hanson, 2004). Simulation training has been used for many years in a variety of settings including medicine and the military. In the 1960s, simulation training was used among doctors to teach the administration of anesthesia and endotracheal intubation on corpses (Lateef, 2010). Since then, patient simulators with physiological and pharmacologic responses have been developed to teach a variety of skills such as cardiac life support (Wayne et al., 2006) and geriatric medical procedures (Braude et al., 2015). Simulation training has also been effective in the military. In 1929, Edwin Link created the world's first flight simulator to train pilots to fly in inclement weather, which was later used in World War II to teach pilots to fly bomber planes (Link, 1937). Today the military continues to teach life-saving skills through simulation and

virtual reality simulation. With safety being a top concern of these fields, simulation training has been integrated into training in order to have more favorable outcomes.

In small-scale simulation training, a doll of some kind is manipulated by the trainee to represent the trainee in a small-scale model. Page, Iwata, and Neef (1976) evaluated small scale-simulation for teaching five adolescences with intellectual disabilities to safely cross the street. Their simulation consisted of a small model of the participant's school and surrounding streets, along with dolls to represent the participants. Their results found that skills taught in the simulated environment generalized to the natural environment. Thus, by participating in small-scale simulation training, the participants were at less risk than teaching them in the natural environment. Neef, Iwata, and Page (1978) used the same model to teach bus-riding skills. They found similar results—small-scale simulation training was effective. Additionally, this method of training was more cost and time effective.

Most recently, Maxfield et al. (in press) used small-scale simulation training to teach firearm safety skills to typically developing children. Maxfield et al. found that after one to two training sessions using a doll, a replica house, and gun scaled to house and doll, three children demonstrated the target safety skill both in the small-scale simulation, and more importantly, in the natural environment during in situ assessments. Maxfield et al., like Neef et al. (1978), also reported that small-scale simulation training took fewer resources and less time. Furthermore, the research was ranked highly in social validity and low in a side effect questionnaire. Caregiver reports indicated that that they were very satisfied with the study, and their children seemed to be more cautious and concerned about the issue of firearms. Although this intervention was effective in teaching typically developing children firearm safety skills, it is unclear if the same procedures would be effective in teaching children with Autism Spectrum Disorder (ASD).

Therefore, the purpose of this study is to evaluate the effectiveness of small-scale simulation training for teaching firearm safety skills to children with an ASD diagnosis.

CHAPTER TWO:

METHOD

Participants and Setting

Three participants, ages 5 to 6, were recruited for the study using flyers and word-of-mouth in a clinic setting that provides ABA therapy services. Participants all had an ASD diagnosis. Pseudonyms are used to discuss participants. Garret was 6 years old and lived in a home with his parents and two brothers. He received ABA therapy 6 hr per week. Garret had exposure to BST and IST for learning social skills. Eric was also 6 years old and lived with his parents and received therapy 5 hr per week. Eric also had exposure to BST and IST with some success in teaching social skills. The third participant, Mackenzie, was 5 years old and lived with her parents. She received 6 hr of ABA therapy per week. All participants had strong intraverbal skills and were able to speak in complete sentences. In order to participate, participants were required pass a screening assessment. The first part of the assessment involved having the child engage in an activity in one room and then report it to an adult afterwards in a separate room when asked. The second part of the assessment involved the researcher manipulating the doll and required the participant to describe what the doll was doing. All participants passed the screening assessment and were able to participate.

The researcher also provided a screening questionnaire to the caregiver to learn pertinent information about the participant and his or her environment related to the study. The questionnaire asked questions related to the participant's verbal abilities, imitation skills, firearm

safety knowledge, and firearm exposure (see Appendix A). The answers to this questionnaire did not exclude any potential participant from participating in the study.

The assessments and simulation training occurred in various areas of the participants' homes. This area was determined after obtaining consent. The areas were open and free of clutter. These areas included the living room, kitchen, and bedrooms. Additionally, caregivers of the participants had to agree to keep any firearms that they own locked during the duration of the study in order to maintain the participant's and researcher's safety. Eric was the only participant whose family owned a firearm, and they agreed to keep it locked in a safe for the duration of the study.

Materials

A small-scale model of a home was used during simulation training. The model, used previously by Maxfield et al. (in press), included two bedrooms, a kitchen, a living room, a bathroom, and hallway. The model also included replica furniture and household items, including a handgun. The replica did not have a roof or ceilings so that the participant was able to see into the house. Dolls of varied genders and ethnicity were available so that one would resemble each participant. A video camera was used to record assessments and training sessions. A disabled handgun was used for in situ assessments.

Target Behavior

The target behavior, not touching the gun, leaving the area, and telling an adult, was evaluated on a 0- to 3-point scale. The participant received a score of 0 if he or she touched the gun during the assessment. A score of 1 was given if the participant did not touch the gun but remained in the area. A score of 2 was given if the participant did not touch the gun and left the room, but did not tell an adult. A score of 3 was given if the participant did not touch the gun,

left the room, and told an adult or did not touch the gun, yelled for an adult to come to the room, and told the adult about the gun. The researcher also recorded any behavior the child engaged in when touching the gun; picking it up, pointing it, looking down the barrel, simulating shooting, and attempting to pull the trigger.

Assessment

In situ assessments were conducted in baseline and intervention phases to evaluate the effects of training. In addition, simulation assessments were conducted periodically to see if their results corresponded with the results of the in situ assessments. During in situ assessments, the caregiver delivered an instruction to the participant to go to a different room which lead the child to locate the clearly visible gun. For example, the participant's caregiver placed a firearm in the kitchen without the child's knowledge and then told the participant to go eat a snack in the kitchen. If the participant did not return within 30 s from entering the room with the gun and orienting toward the gun, the caregiver went to the room and asked the child to come out. The caregiver was instructed to refrain from providing praise or feedback following the response of the participant. The researcher was not present during the in situ assessments. During in situ assessments, the researcher observed the participant via a live feed from the video recording to determine when the 30 s had passed. Simulation assessments consisted of the participant manipulating the doll in the small-scale model. The toy firearm was placed somewhere in the model. The researcher said, "Let's pretend you are this doll, and show me what you would do using your doll," and delivered an instruction to the participant that ensured the participant found the firearm with the doll. In this assessment, the researcher had a doll that represented an adult positioned in a separate room.

Interobserver Agreement

Interobserver agreement (IOA) was calculated for 45% of sessions. The sessions were video recorded for research assistants to score the target behavior. Interobserver agreement, calculated by dividing the number of agreements on the three target behaviors by the total number of agreements and disagreements, was 100%.

Treatment Integrity

Treatment integrity was evaluated for 40% of sessions by providing a task analysis of the intervention to a research assistant (see appendix B). The percentage correct was calculated by dividing the number of correct steps by the total number of steps. Treatment integrity was 100%.

Social Validity and Side-Effects Questionnaire

For social validity, a questionnaire using a 5-point Likert scale was provided to the caregivers of the participants (see Appendix C). Questions such as “Did you enjoy the study?” and “Would you recommend this kind of training to other families?” were asked. In addition to the social validity questionnaire, a side-effects questionnaire adapted from the side-effects questionnaire used by Johnson et al. (2005) was also provided to the caregivers of the participants after participation in the study (see Appendix D). The six-item side-effect questionnaire asked questions related to any changes in the participant such as, “Does your child seem to show more fear towards firearms?” The questionnaire was provided to the caregiver of the participant to assess changes in the participant’s behavior following the study and receive further feedback on the parents’ attitude regarding the study. The questionnaire was provided with prepaid postage to be mailed back to the researcher anonymously.

Procedure

Small-scale simulation training was evaluated with a multiple baseline design across participants. First, baseline data were collected using in-situ assessments and simulation assessments. Phase changes were based on in situ assessment data. During intervention, the participants were provided with one session of small-scale simulated BST followed within 1 day by an in situ assessment. The safety skills were considered mastered when the participant received a score of 3 during three consecutive in-situ assessments. If the participant did not score a 3 in the first in situ assessment, a booster session of small-scale simulation training was provided. If the participant did not score a 3 after two booster sessions, the researcher conducted IST.

Baseline. Baseline data consisted of both in-situ assessments and simulation assessments. No feedback or consequences were delivered to the participant by either the researcher or caregiver. Caregivers were trained using BST to ensure that they were prepared for what to do based on the participant's performance during an assessment. If the child left the room and told the parent about the gun, the parent thanked the child for telling and then went into the room, picked the gun up, and put it away in another room. If the child did not leave the room in 30 s after orienting in the direction of the gun, the parent entered the room. Regardless of whether the child was not touching the gun, touching the gun, or playing with the gun, the parent calmly walked up to the gun, picked it up (or took it from the child's hands), and said in a neutral tone of voice, "I better put this gun away," while walking from the room with the gun. The parent did not discuss the gun further with the child. The parent engaged in this behavior during in situ assessments in baseline and the small-scale simulation training intervention.

Simulation training. Simulation training included instructions, modeling, rehearsal, and feedback applied to the participant's behavior of manipulating the doll in the model. The participants were also required to verbalize the steps of the safety skill while manipulating their doll in the model. During simulation training, the model was placed in front of the participant with the toy firearm in a room in the model, and the researcher presented the participant with a scenario. The participant was provided with instructions on what to do with the doll upon the doll finding the gun. The researcher modeled the correct behavior while vocalizing the steps. For example, upon finding the toy gun, the researcher, using her doll, said, "I found a gun! I need to tell dad!" The researcher then took her doll to the dad doll and said, "Dad, there's a gun." The participant then rehearsed the skill with the doll and received feedback from the researcher (praise for correct performance, further instruction for errors). The participant demonstrated the safety skill with the doll three consecutive times with a gun placed in different locations to end the simulation training session. Multiple exemplars were trained by varying the location of the gun, instructions, and caregiver dolls. Within 1 day following training, an in situ assessment was conducted. If booster sessions were necessary, the same steps were repeated. However, if the participant engaged in the correct response after the model was presented, praise was delivered and the participant was required to demonstrate the safety skill an additional three times.

In-situ training. In-situ training occurred if the participant failed to demonstrate the skill 30 s after finding the gun during an in-situ assessment following the second simulation training booster session. In-situ training included instructions, modeling, rehearsal, and feedback. When the researcher entered the room, she stopped any activity the participant was engaging in and provided instructions to engage in the target behavior. When the researcher entered the room and delivered instructions, she did so with an urgent tone to show the participant the seriousness of

the situation. The researcher modeled the target behavior while vocalizing the steps. The participant then rehearsed the steps, and the researcher provided praise for correct performance and/or corrective feedback consisting of further instruction. When the child ran from the room to tell the parent about the gun, the parent provided enthusiastic praise. The participant demonstrated the safety skill three consecutive times to conclude the in-situ training session. Within 1 day, an in-situ assessment occurred, and if the participant did not score a 3, further in situ training sessions occurred.

CHAPTER THREE:

RESULTS

Results varied for all participants who received small-scale simulation training. Small-scale simulation training was effective for Garrett but not the other two participants. In situ training was effective for Mackenzie but not for Eric. Garret touched the firearm during two different in situ assessments and one simulation assessment. During the first in situ assessment, Garret picked up the firearm by the handle and held it in the air. He stayed in the assessment area and did not report the firearm to his parents. During the second in situ assessment, he poked the firearm with his finger and sat next to it. Again, he stayed in the assessment area and did not report the firearm. During both assessments, he made statements to himself about finding a “laser gun.” During the simulation assessment, Garret did not touch the firearm, except for dropping his doll on top of it. However, he did pick it up himself. Following simulation training, Garret engaged in the safety responses, scoring a 3 for the assessment. After finding the firearm, he stepped back and walked about three feet from the assessment area and yelled to his parents that he found a laser gun. He engaged in similar responses for the following assessments scoring a 3. During a simulation assessment, Garret manipulated the doll to engage in the correct response, scoring a 3.

Eric had three in situ assessments and two simulation assessments in baseline. During the first in situ assessment, Eric did not touch the firearm, however he did not leave the area or report it to a parent. He engaged in a similar response during the simulation assessment. He remained in the area without touching the firearm but did not report it. During his second in situ

assessment, he picked up the firearm by the handle and held in the air. He then put it down and left the room, scoring a 0. During a second simulation assessment, Eric scored a 0 by having his doll lay on top of the firearm. During the final baseline in situ assessment, he scored a 1. Following simulation training, Eric touched the gun scoring a 0. Following a booster session of simulation training, he scored a two by leaving the room. After the final booster session, he scored a 1 by remaining seated next to the firearm. In situ training was conducted immediately after the third in situ assessment in the intervention phase. Following in situ training, Eric scored a 1. Further in situ training was conducted and he scored 1 on the next two assessments.

Mackenzie had five in situ assessments and three simulation assessments during baseline. During the first in situ assessment, Mackenzie scored a 1; she remained in the area and did not report finding the firearm, but she did not touch it. Mackenzie picked up the firearm during the second in situ assessment scoring a 0. During the third in situ assessment, she remained in the area again scoring a 1. During the fourth and fifth in situ assessments, she picked up the firearm scoring a 0. During her first simulation assessment, she scored a 1. During the second, she picked up the firearm and had her doll pretend to shoot the dad doll, scoring a 0. In a third simulation assessment, Mackenzie picked up the firearm scoring a 0. Following small-scale simulation training, Mackenzie scored a 0 during the first in situ assessment. She picked up the firearm, yelling “There’s a gun!” Although she reported the gun, she received a 0 due to picking up the firearm. Following a booster session of simulation training, she scored a 1. She remained seated with the firearm in front of her. After 30 s had passed, the gun was removed and she quietly said, “It’s a gun.” A second booster session was conducted. When an in situ assessment was conducted, Mackenzie scored a 0 after picking up the firearm. Immediately after the assessment, in situ training was conducted. During the next in situ assessment Mackenzie scored a 0.

Additional in situ training was conducted, and she scored a 3 during the next three consecutive in situ assessments. She also scored a 3 during a simulation assessment.

Social validity data were collected from three parents using a questionnaire provided at the end of the study. The scores were averaged. Parents strongly agreed that their child enjoyed participating in this study (4.6), believed their child was safer now if he or she finds a gun (4.3), liked using simulation training (4.3), liked using simulation training to teach their child (4.6), would use simulation training to teach their child other skills (4.6), and would recommend simulation training to others (4.6). Side effect questionnaires were completed by three parents. One parent reported that their child was much more scared of firearms. All parents reported their children were much more cautious and hesitant to touch firearms. Two parents reported their children were a little more upset and concerned about personal safety. All parents were satisfied with the researcher's communication.

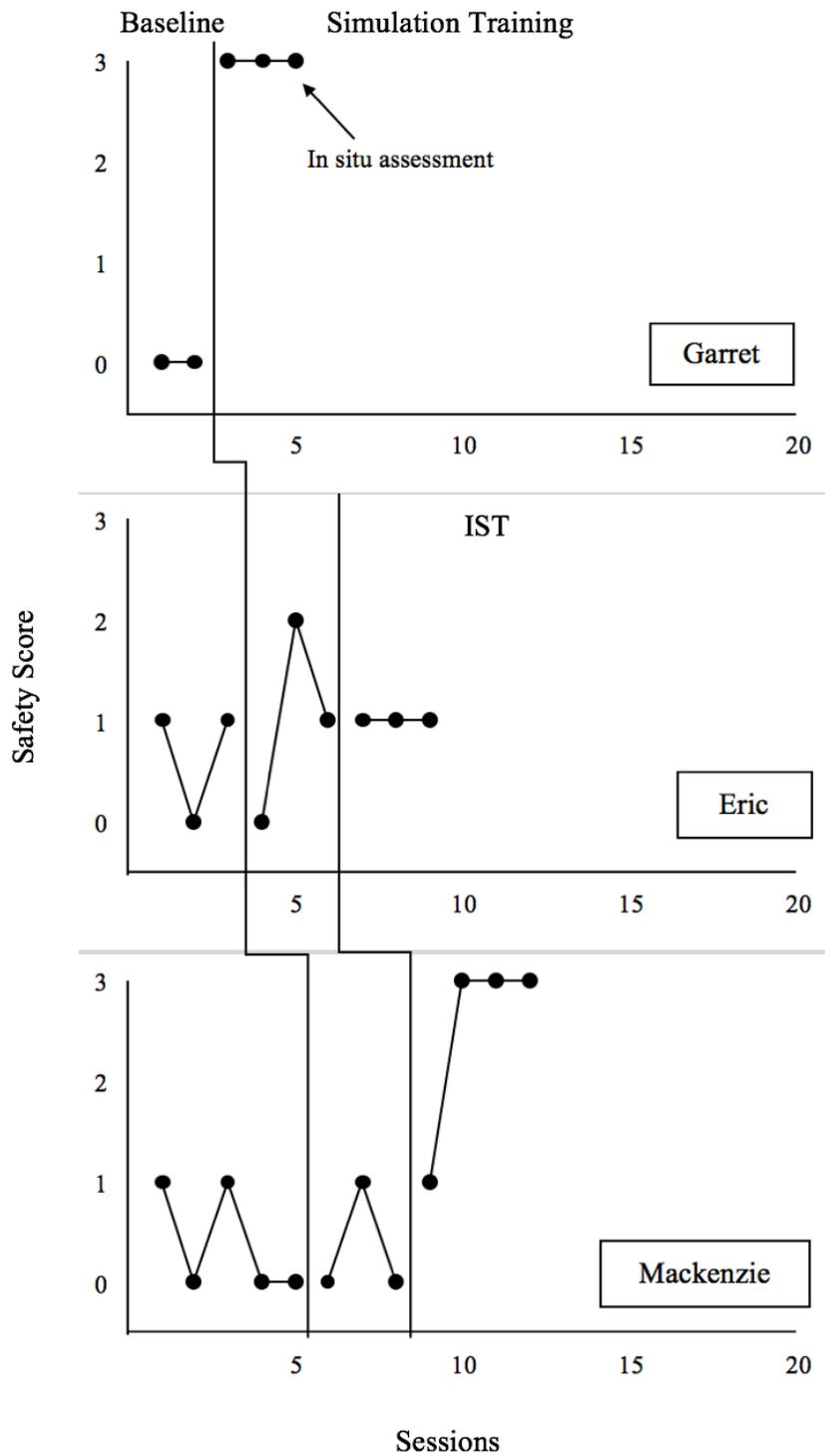


Figure 1. Each participant's score during in situ assessments in baseline, simulation training, and in situ training phases.

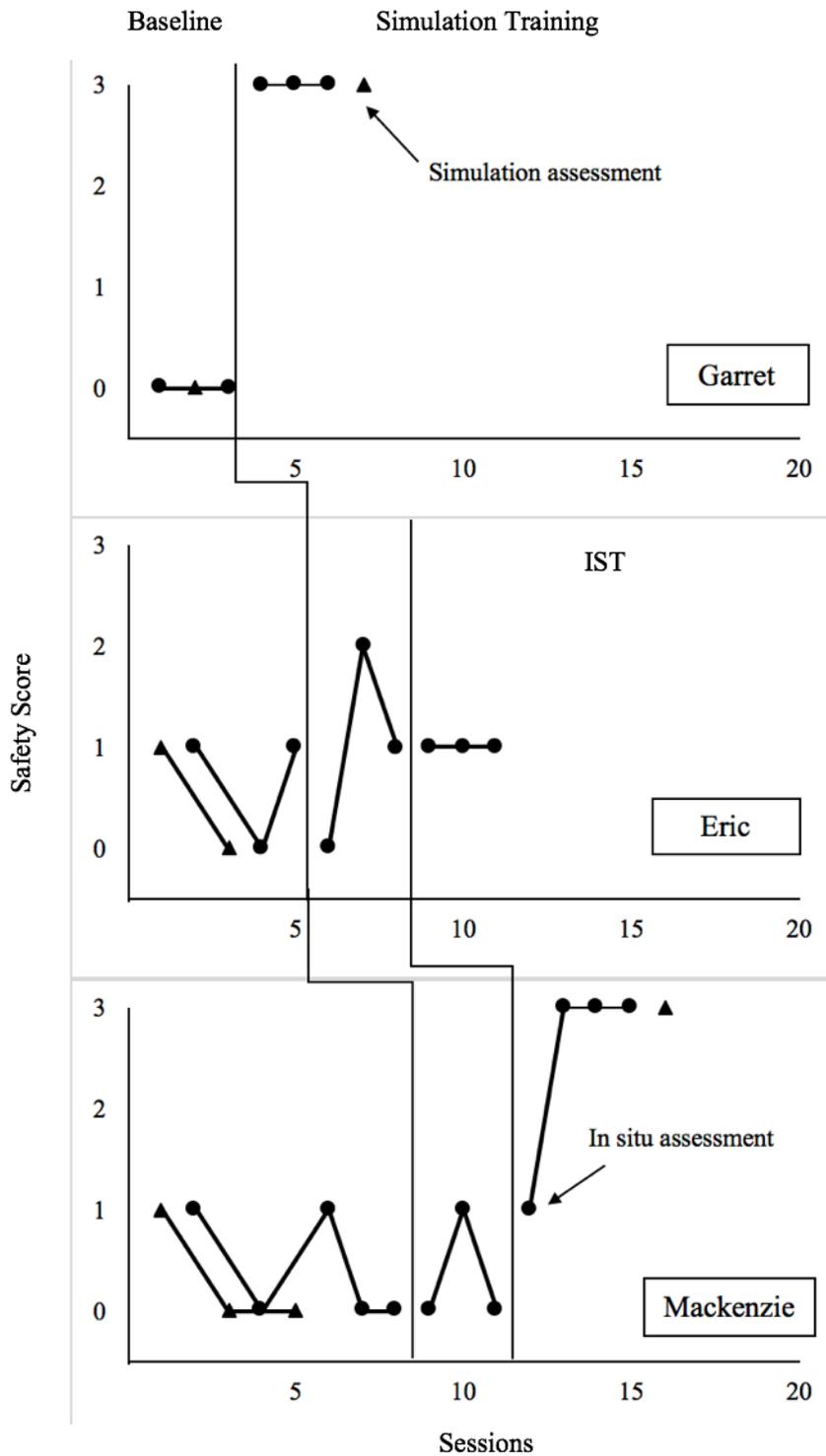


Figure 2. Each participant's score during simulation and in situ assessments in baseline, simulation training, and in situ phases. The circles represent in situ assessments, and the triangles represent simulation assessments.

CHAPTER FOUR:

DISCUSSION

This study investigated the effects of using small-scale simulation training to teach firearm safety skills to children with ASD. Findings from this study suggest that simulation training may be an effective procedure for teaching firearm safety skills for some children. Garret demonstrated the skills during in situ assessments following one session of simulation training. However, it was not an effective procedure for teaching Eric and Mackenzie, and further training was needed to generalize the skill to the natural environment. More research is needed to establish when and for whom small-scale simulation training will be effective. The results showed that IST was effective for Mackenzie but not for Eric after the failure of small-scale simulation training.

Although none of the parents reported that their children had received any firearm safety training, all of them seemed surprised at the unsafe behaviors the participants engaged in when finding a gun. After Mackenzie's second in situ assessment, her mom reported being shocked that her child would pick up the gun. Additionally, during a simulation assessment, Mackenzie had the doll picking up the gun and saying, "I'm going to shoot you, Daddy!" Mackenzie's mom reported to the researcher that she was hesitant to participate at first but "this is the world we live in." After seeing her daughter's behavior, she was happy to continue participation. Furthermore, her responses on the social validity survey suggest she was happy she participated and thought the training was valuable.

The results of this study are different from Maxfield et al. (in press) who showed that small-scale simulation training was effective for typically developing children. In this study, it

only worked for one of the three children with ASD. More research is needed to replicate small-scale simulation training with kids with and without ASD to see if it is differentially effective across these groups. The results of this study are similar to results from studies showing that BST is only effective for some children and that in situ training is only effective for some children (e.g., Hanratty et al., 2016; King & Miltenberger, 2017). King and Miltenberger (2017) showed that, although IST was effective for three participants, one participant needed an added incentive to demonstrate the skill (2017). Hanratty et al. (2016) found that additional contingencies were needed for preschoolers to demonstrate the skill. If a participant did not demonstrate the skill, he or she had to practice for an additional 10 min instead of playing with his or her peers. Further, a time out procedure was needed for one participant. These results show that in situ training alone is not always effective. An added reinforcement or punishment procedure may be needed. More research is needed to establish the limits of effectiveness of small-scale simulation training and in situ training for teaching safety skills.

It is not clear what variables contributed to the success of small-scale simulation training for Garret. It may be possible that Garret's previous exposure to BST was beneficial in generalizing the behavior of manipulating his doll to engage in safety skills in the model to his own behavior during in situ assessments. In addition, it is unclear why in situ training was not effective for Eric. Eric had exposure to IST in learning other skills, but often took more sessions to be successful. With more training sessions, IST may have been effective for promoting the generalization of the safety skills for Eric. Researchers have shown that numerous IST sessions are necessary in some cases before the participant exhibits the safety skills consistently during in situ assessments (Johnson et al., 2005). It is also possible that when Eric found the gun, because it was placed next to a preferred item, praise for doing the right thing could not compete with

reinforcement from interacting with the preferred item. Another limitation is the possibility of carryover effects from the small-scale simulation training phase to in situ training. It is unknown if simulation training increased the effectiveness of in situ training for Mackenzie.

It is unclear which components of small-scale simulation training were effective in teaching the safety skills to the children in Maxfield et al. (in press) and to Garrett in this study. It is likely that requiring participants to actively engage with their doll and describe the doll's actions and providing feedback based on the doll's performance was necessary for correct responding during in situ assessments. It is also unclear how well established a child's generalization skills need to be for this type of training to be effective. A repertoire of generalization seems to be an important skill to have for small-scale simulation training to result in generalization to in situ assessments. One focus of future research may be to determine whether children differ with respect to the degree that they have experience learning skills in one context and performing them in another. Although this may be an important skill or learning history to have for small-scale simulation training to be effective, it was not assessed prior to training in this study or any other study to our knowledge.

Future research should replicate this study with different target behaviors such as poison and abduction prevention, children of different ages, and with a larger number of children due to the lack of research on small-scale simulation training. Future research could also assess generalization across different environments, such as schools and community. It would also be interesting to evaluate this procedure using dyads, such as siblings, during training and assessments.

In summary, this study demonstrated that small-scale simulation training may be effective for some children with ASD. Although it is unclear why this intervention was effective

for one participant and not for others, it has the possibility to teach firearm safety skills in an accessible and inexpensive way.

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APPENDICES

Appendix A

Screening Questionnaire

1. Do you believe your child can report what happened in one room to an adult in a separate room?

- Yes
- No
- Maybe

2. Can your child describe the actions of other people or items?

- Yes
- No
- Maybe

3. Can your child imitate the actions of others?

- Yes
- No
- Maybe

4. Do you or someone in your household own a firearm(s)?

- Yes. If so, how many? ____
- No

5. If you or someone in your household owns a firearm, are you willing to keep it locked for the duration of the study?

- Yes
- No
- N/A

6. Do you believe your child knows what to do when finding a gun?

- Yes
- No
- Maybe

7. Has your child received gun safety training?

- Yes
- No
- Unsure

Appendix B

Simulation Training Treatment Integrity Checklist

Task	Score		
1. Arrange model to resemble the environment, placing firearm in room it is likely to be found	Yes	No	N/A
2. Present the model to the participant	Yes	No	N/A
3. Assign roles to the dolls (e.g. participant or mom doll)	Yes	No	N/A
4. Present SD to engage in play with the dolls in the model	Yes	No	N/A
5. If the participant engages in the target behavior (all steps correct) provide social reinforcement	Yes	No	N/A
6. If the participant does not engage in one or more steps of the target behavior: <ul style="list-style-type: none"> i) Immediately stop play ii) Provide instructions for the target behavior iii) Model the target behavior iv) Have the participant rehearse the target behavior until all steps are correct v) Rearrange the model and have the participant perform all steps correctly for three consecutive scenarios 	Yes	No	N/A
	Yes	No	N/A

In Situ Training Treatment Integrity Checklist

Task	Score		
1. The researcher begins IST in the environment where the participant failed to demonstrate the target behavior. IST should begin following the participant orienting toward the gun but failing to demonstrate the safety skills within 30 s	Yes	No	N/A
2. The researcher verbally prompts the participant to stop activity	Yes	No	N/A
3. The researcher provides instructions for the target behavior	Yes	No	N/A
4. The researcher models the target behavior	Yes	No	N/A
5. The researcher has the participant rehearse the target behavior until all steps are correct	Yes	No	N/A
6. The researcher rearranges the environment and has the participant demonstrate the target behavior with all steps correct for three consecutive scenarios	Yes	No	N/A
7. The researcher provides positive and corrective feedback to the participant if he or she makes an error	Yes	No	N/A
8. If the participant engages in all steps of the target behavior correctly, provide social reinforcement	Yes	No	N/A

Appendix C

Social Validity Questionnaire

On a scale of 1 to 5, circle your level of agreement with the statements below.				
My child enjoyed participating in this study.				
1 Strongly Disagree	2 Disagree	3 Neutral/ No opinion	4 Agree	5 Strongly Agree
I believe my child is safer now if he/she finds a gun.				
1 Strongly Disagree	2 Disagree	3 Neutral/ No opinion	4 Agree	5 Strongly Agree
I liked using simulation training to teach my child.				
1 Strongly Disagree	2 Disagree	3 Neutral/ No opinion	4 Agree	5 Strongly Agree
I would use simulation training to teach my child other skills.				
1 Strongly Disagree	2 Disagree	3 Neutral/ No opinion	4 Agree	5 Strongly Agree
I would recommend simulation training to others.				
1 Strongly Disagree	2 Disagree	3 Neutral/ No opinion	4 Agree	5 Strongly Agree

Comments:

Appendix D

Side-Effect Questionnaire

1. Compared to before this study my child now appears:
- a. Scared: afraid to leave parents, showing fear of firearms
 - Much more scared
 - A little more scared
 - No change
 - Less scared
 - Much less scared

If a change occurred, please describe briefly:

- b. Cautious: hesitant to touch firearms
 - Much more cautious
 - A little more cautious
 - No change
 - Less cautious
 - Much less cautious

If a change occurred, please describe briefly:

- c. Upset: concerned about the issue of firearms, personal safety, etc.
 - Much more upset
 - A little more upset
 - No change
 - Less upset
 - Much less upset

2. Other changes I noted in my child's behavior are:
Please describe or mark N/A if no change was observed

3. How pleased are you that your child participated in the study?
- Very pleased
 - Pleased
 - Neutral
 - Disappointed
 - Very disappointed

4. How satisfied are you with the way the researchers communicated what was going on throughout the study?

- Very satisfied
- Satisfied
- Neutral
- Unsatisfied
- Very unsatisfied

5. Did you terminate your child's participation in the study? Yes or No. If yes, please explain why.

6. Please note any additional comments you have about the study.

Appendix E

Consent Form

Study ID:Pro00035161 Date Approved: 9/21/2018



Consent to Participate in Research & Parental Permission for my Child to Participate in Research

Pro # _00035161_____

The following information is being presented to help you and your child decide whether or not you would like to be a part of a research study. Please read this information carefully. If you have any questions or if you do not understand the information, we encourage you to ask the researcher.

We are asking you to take part, and to allow your child to take part, in a research study called:

Evaluating Small Scale Simulation Training for Firearm Safety for Children with ASD

The person who is in charge of this research study is Margaret Orner. This person is called the Principal Investigator. However, other research staff may be involved and can act on behalf of the person in charge. She is being guided in this research by Dr. Raymond Miltenberger.

The research will be conducted in the participant's home.

Purpose of the study:

The purpose of this study is to evaluate the effectiveness of small scale simulation training for firearm safety for children with ASD.

Why are you & your child being asked to take part?

We are asking you and your child to take part in this research study because your child is between the ages of 4 to 6 and has an ASD diagnosis. We want to evaluate this teaching

procedure for safety skills for this population.

Study Procedures:

Both you and your child are being asked to participate. If you and your child take part in this study, your child will be asked to:

- Enter a room where a disabled firearm has been placed 3 to 25 times
- Participate in simulation training and assessment using a model house and dolls
- Participate in research in his/her home
- Research will last up to 3 months through 6 to 18 sessions that last 10 to 60 minutes
- Be videotaped for data collection You will be asked to:
- Complete various surveys related to the research
- Display and retrieve a disabled firearm during assessments

Total Number of Participants About 18 individuals will take part in this study at USF (6 children and 12 parents)

Alternatives / Voluntary Participation / Withdrawal If you decide not to let your child take part in this study and you do not participate, that is okay. Instead of being in this research study you and your child can choose not to participate. You and your child should only take part in this study if both of you want to. You or your child should not feel that there is any pressure to take part in the study to please the study investigator or the research staff.

If you or your child decide not to take part:

- You will not be in trouble or lose any rights you would normally have.
- You will still get the same services you would normally have. Alternatives to participating in the study include: Behavioral skills training or in situ training You can decide after signing this informed consent form that you no longer want your child or yourself to take part in this study. We will keep you informed of any new developments which might affect your willingness to participate or allow your child to continue to

participate in the study. However, you and your child can decide to stop taking part in the study for any reason at any time. If you and/or your child decide to stop taking part in the study, tell the study staff as soon as you can.

Benefits The potential benefits to you and your child include:

- Learning what to do if he or she finds a firearm and engage in that response

Risks or Discomfort

There may be psychological discomfort from being in the presence of a gun. However, previous research has reported no risk or discomfort. The firearm has been disabled by the police department. Multiple safety measures have been employed to ensure the experimental firearm is safe for use in research. The experimental firearm's barrel has been filled with metal. The firearm cannot be loaded, the firing pin has been removed, and the trigger has been welded so that it cannot be pulled.

Additionally, there may be a potential risk of breach of confidentiality, however many measures have been taken to minimize this risk.

Compensation

You and your child will receive no payment or other compensation for taking part in this study.

Cost

It will not cost you anything to participate and to let your child take part in the study.

Privacy and Confidentiality

We will do our best to keep you and your child's records private and confidential. We cannot guarantee absolute confidentiality. You or your child's personal information may be disclosed if required by law. Certain people may need to see you or your child's study records. These individuals include:

- The research team, including the Principal Investigator and all other research staff
- Certain government and university people who need to know more about the study, and individuals who provide oversight to ensure that we are doing the study in the right

way

■ The USF Institutional Review Board (IRB) and related staff who have oversight responsibilities for this study, including staff in USF Research Integrity and Compliance.

We may publish what we learn from this study. If we do, we will not include you or your child's name. We will not publish anything that would let people know who you are.

You can get the answers to your questions, concerns, or complaints. If you have any questions, concerns or complaints about this study, call Margaret Orner at 920-960- 8807.

If you have questions about you or your child's rights, complaints, or issues as a person taking part in this study, call the USF IRB at (813) 974-5638 or contact by email at RSCH-IRB@usf.edu.

Consent to Participate and Parental Permission for My Child to Participate in this

Research I freely give my consent to take part and to let my child take part in this study. I understand that by signing this form I am agreeing to take part in and to let my child take part in research. I have received a copy of this form to take with me.

_____ Signature of Person and
Parent of Child Taking Part in Study Date

_____ Printed Name of Person
and Parent of Child Taking Part in Study

Statement of Person Obtaining Informed Consent I have carefully explained to the person taking part in the study what he or she can expect from their participation. I confirm that this research subject speaks the language that was used to explain this research and is receiving an informed consent form in their primary language. This research subject has provided legally effective informed consent.

_____ Signature of Person
Obtaining Informed Consent

_____ Printed Name of Person
Obtaining Informed Consent

_____ Date

Appendix F
IRB Approval Letter

10/23/2018

Margaret Orner

CFBH-Child and Family Behavioral Health

RE: **Full Board Approval for Initial Review** IRB#: Pro00035161 Title: Evaluating Small Scale Simulation Training for Teaching Firearm Safety to Children with ASD

Study Approval Period: 9/21/2018 to 9/21/2019

Dear Ms. Orner:

On 9/21/2018, the Institutional Review Board (IRB) reviewed and **APPROVED** the above application and all documents contained within, including those outlined below.

Approved Item(s): Protocol Document(s): [IRB Protocol- Margaret Orner Evaluating Small Scale Simulation Training V1 10.9.18.docx](#)

Consent/Assent Document(s)*: [Combined consent and parental permission .pdf](#)

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consent/assent documents are valid until the consent document is amended and approved.

Research Involving Children as Subjects: 45 CFR 46.404

This research involving children as participants was approved under 45 CFR 46.404: Research not involving greater than minimal risk to children is presented.

Requirements for Assent and/or Permission by Parents or Guardians: 45 CFR 46.408

Permission of one parent is sufficient. Assent is not appropriate due to the age, maturity and/or psychological state of the child.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the

approved research must be submitted to the IRB for review and approval via an amendment. Additionally, all unanticipated problems must be reported to the USF IRB within five (5) business days.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

Kristen Salomon, Ph.D., Chairperson USF Institutional Review Board