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Evaluating Behavioral Skills Training to Train Online Gaming Safety Skills

by

Henry Chovet Santa Cruz

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Science in Applied Behavior Analysis
Department of Child and Family Studies
College of Behavioral and Community Sciences
University of South Florida

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Keywords: remote, BST, caregiver-implemented IST, in-situ assessments, strangers, lures

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DEDICATION

I dedicate this manuscript to my parents, Cecilia Santa Cruz and Jean Pierre Chovet.

Thank you for always supporting my endeavors and pushing me to be my best. I would also like to dedicate this manuscript to my two brothers, Christopher and Jean Paul. I love you both very much and you guys are always in my thoughts. Additionally, I dedicate this manuscript to my rock throughout this process, my girlfriend, Victoria Morejon. Thank you for constantly easing my anxieties and patiently dealing with me when I was at my most stressed. This would not have been possible without you by my side each step of the way.

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ABSTRACT

Despite the growing concern of caregivers as their children spend an increasing amount of time on the internet interacting with strangers, there is a limited body of research that focuses on online safety skills training. Behavioral skills training has been used by researchers to teach children firearm safety skills, poison safety skills, and abduction prevention skills. Given that the skills taught in abduction-prevention training are also to relevant online safety, the researcher assessed the use of behavioral skills training for teaching online safety skills to a 9-year-old, Clark. In-situ assessments took place while playing the popular online game, *Among Us*, and consisted of confederates presenting lures to Clark. Before training, Clark scored 1's and 0's, indicating a lack of online gaming safety skills. Clark scored at mastery criterion (i.e., three scores of 3 in a row) following training. During the first 2-week-follow-up, Clark scored a 1 because he did not leave the game following the presentation of a lure; Clark's mother immediately implemented in situ training. Clark scored at mastery criterion during the next follow-up assessment, indicating the effectiveness of the caregiver-implemented in situ training.

CHAPTER ONE:

INTRODUCTION

Children and adolescents spend a large portion of their time online. An annual report by the US National Center for Education Statistics (2018) found that 94% of 3- to 18-year-olds had access to the internet while home. Many of these children and adolescents interact with others over the web daily. The results of a national survey of teens 13- to 17-years-old, conducted by the Pew Research Center, found that 57% of the surveyed teens had made a new friend online (Lenhart et al., 2015). Although social media (e.g., Facebook, Instagram, etc.) is the most common place for youth to meet new people, 36% of the 1060 participants in the survey had met a new friend on an online video game (Lenhart et al., 2015). While online, players can seamlessly interact with others from around the world. Although many interactions with strangers online can be benign, others can potentially lead to dangerous or uncomfortable encounters. Madigan et al. (2018) conducted a meta-analysis of studies reviewing online sexual exposure (37,649 participants total) and solicitation (18,272 participants total) to minors. The researchers found that one in five youth encounter unwanted sexually explicit material while online, and one in nine youth experience sexual solicitation from strangers online.

Cernikova et al. (2016) interviewed 9- to 16-year-olds in the Czech Republic to gather information on their positive and negative experiences with strangers online. Some negative experiences included strangers asking personal questions or soliciting sexual behavior. Although a small percentage of youth who meet strangers online actually contact them in real life, the potential is still a cause for concern (Livingston & Smith, 2014). Zhang-Kennedy et al. (2016)

interviewed 14 parent-child dyads to assess their experiences and perceptions about internet usage; all but one parent viewed “stranger danger,” such as sharing private information with unidentified strangers, as a major concern when their children were online. Despite parents’ fears, the researchers found that the children were not as concerned about interacting with strangers online and other dangers because “they did not yet know how to apply the concept of privacy online” (Zhang-Kennedy et al., 2016, p. 397). In a similar vein, Macaulay et al. (2020) showed that children do not always know what safety threats exist online or have the knowledge or skills to respond to online safety threats.

Despite the prevalence of youth accessing the internet and interacting with strangers, there is limited research assessing the safety skills of youth when online or teaching online safety skills. Boulton et al. (2016) examined the effectiveness of older students utilizing the information-based Cross-Age Teaching Zone (CATZ) intervention to teach younger students’ knowledge of online risks and safety. The results of the study showed that CATZ tutors and tutees scored higher when answering open-ended questions related to online risks and safety compared to participants who did not receive CATZ training. Although the participants scored high on these knowledge measures, it is unclear if participants would have demonstrated the safety skills if presented with a lure in a real online game.

The skills needed for children to respond safely to lures delivered in an online gaming context are similar to the skills needed to respond safely to abduction lures delivered in a face-to-face context. The three types of safety responses described in abduction-prevention research are for children to say no or otherwise refuse the request delivered by the stranger (the lure), leave the situation (get away from the stranger), and report the lure to a responsible adult (Miltenberger & Olsen, 1996). Specifically, in response to a lure in which a potential abductor asks the child to

leave with them, the participant is taught to say, “No” or “I need to talk to my mom,” to leave the immediate area of the stranger within a specific amount of time after the lure is presented, and to immediately tell a parent or teacher about their experience with the stranger (e.g., Johnson et al., 2005; Poche et al., 1988). In the online gaming context, a safe response to a lure would be similar; to recognize the lure and not respond, leave the game, and find a parent and report the lure.

Research on teaching abduction prevention skills (and other safety skills) to children has demonstrated that active learning approaches such as behavioral skills training (BST) and in-situ training are most effective. BST involves instructions, modeling, rehearsal, and feedback to teach skills. In teaching abduction prevention skills, the researcher describes the different types of abduction lures and describes the skills the child needs to respond safely to these lures. The researcher then models the skills in role plays that simulate abduction situations so the child sees multiple exemplars of the safety skills. Next, the researcher has the child rehearse the skills in role plays in which abduction lures are simulated and the child engages in the three skills described earlier. In the context of these rehearsals, the researcher provides praise for correct performance and corrective feedback involving further instruction for any aspect of performance that was incorrect. Over multiple training trials, the child engages in the safety skills until correct performance occurs multiple times. Researchers have shown that BST can be successful to teach abduction prevention skills (Carroll-Rowan & Miltenberger, 1994; Holcombe et al., 1995; Gunby et al., 2010; Johnson et al., 2006; Miltenberger & Thiesse-Duffy, 1988; Poche et al., 1981, 1988; Sanchez et al., 2015) and other safety skills such as firearm safety skills (Himle, Miltenberger, Flessner, & Gatheridge, 2004; Himle, Miltenberger, Gatheridge, & Flessner, 2004;

Gatheridge et al. 2004; Gross et al., 2007), and poison safety skills (Dancho et al., 2008; Morosohk & Miltenberger, 2021; Petit-Frere & Miltenberger, 2020, Rossi et al., 2017).

Poche et al. (1981) were the first to assess the effectiveness of BST for teaching abduction prevention skills to preschoolers. During initial in-situ assessments, none of the participants displayed the safety skills in response to a lure from a confederate. The researchers then utilized an early form of BST, which included modeling, behavior rehearsal, and social reinforcement. In the modeling component, two adult trainers served as a “suspect” and a “child,” respectively, and acted out a scene where the “suspect” approached the “child” and presented a lure. Following the presentation of the lure, the trainer acting as the child modeled the target safety responses. After observing the modeling scene, the participant participated in the behavior rehearsal component. The trainers prompted the participant to act out the same scene with the “suspect” and to engage in the same responses as the “child.” The trainers provided positive reinforcement if the participant engaged in the correct responses. The trainers used instructions, additional modeling, and additional rehearsal if the participant engaged in partly correct or incorrect responses. This was done until the participant responded correctly to the lure once. BST was used to train a number of exemplars (i.e., simple lures, authority lures, incentive lures). After BST, each participant engaged in the abduction prevention skills during follow-up in-situ assessments in different community settings. Numerous other researchers have also shown that BST can be an effective intervention for teaching abduction prevention skills (e.g., Carroll-Rowan & Miltenberger, 1994; Holcombe et al., 1995; Miltenberger & Thiesse-Duffy, 1988).

Miltenberger and Thiesse-Duffy (1988) assessed the efficacy of the Red Flag, Green Flag Prevention book and BST for teaching sexual abuse and abduction prevention skills to children.

Parents were randomly selected for different treatment groups: (a) Red Flag, Green Flag Prevention Book, where parents were given the training book and told to complete it with their child, (b) Red Flag, Green Flag Prevention Book with added instructions, which included written instruction from the researchers to orally rehearse situations from the book and give corrective feedback, and (c) one-to-one training, where the researchers provided individual BST to children. The results of role-play assessments indicated that only BST implemented by the researchers proved to be successful for teaching the target responses. Carroll-Rowan and Miltenberger (1994) compared BST alone, a safety video plus behavior rehearsal, and control group to determine which training procedure was more effective for teaching preschoolers safety responses to abduction lures. The results indicated that the participants in the BST condition scored the highest in self-report assessments and in-situ assessments. Holcombe et al. (1995) developed written instructions to conduct BST, delivered them to teachers, and trained them on the BST procedure for abduction prevention. The teachers then used BST to train their students in small groups of four to six children. The results showed that all participants engaged in the abduction-prevention safety responses during classroom role plays and in-situ assessments.

Although BST is often an effective intervention for teaching safety skills, some research has shown that BST does not consistently result in correct performance during in-situ assessments for all participants (e.g., Himle, Miltenberger, Flessner, & Gatheridge, 2004, Miltenberger et al., 2004; Novotny et al., 2020). Researchers have demonstrated that BST can be enhanced with in-situ training (IST). To conduct IST, following a failed in-situ assessment, a trainer intervenes and conducts training with the child until they perform the correct safety responses (Gross et al., 2007; Gunby et al., 2010; Himle, Miltenberger, Flessner, & Gatheridge, 2004; Johnson et al., 2006; Kelso et al., 2007; Miltenberger et al., 1999, 2004; Tarasenko et al.,

2010). This training consists of multiple rehearsals of the safety skills with feedback in the context where the abduction lure was delivered during the in-situ assessment. Rehearsals occur until the behavior occurs consistently.

Gunby et al. (2010) used BST and IST to teach abduction prevention skills to three 6- to 8-year-olds diagnosed with autism. Only one participant met the mastery criterion following BST. The remaining two participants met mastery criterion once researchers implemented IST; their performances also maintained during three follow-up probes. Tarasenko et al. (2010) trained 7- and 8-year-olds to implement BST to teach 6- and 7-year-olds abduction-prevention skills. Peer trainers implemented IST if a participant did not engage in the safety responses during an in-situ assessments. Participants who initially responded incorrectly to lures following BST later responded at criterion level following IST conducted by peer trainers. Johnson et al. (2006) compared BST with and without IST to teach abduction-prevention skills to 6- and 7-year-olds. The results showed that immediate acquisition effects were similar between the BST group and the BST with IST group, but the participants in the BST with IST group showed significantly better performance at the 3-month follow-up. The results of the study showed the importance of IST and its effects on BST when implemented early in an experiment. Gross et al. (2007), Beck and Miltenberger (2009), and Miltenberger et al. (2013) illustrate the effectiveness of parent-implemented IST. Gross et al. (2007) tested the effectiveness of parent-implemented BST and IST to train four 4- to 7-year-olds firearm safety skills. The researchers provided parents with a training manual detailing BST for firearm safety skills and training videos depicting parent-implemented BST and IST. The results showed when a participant did not respond at mastery level following BST, they achieved criterion scores following parent-implement IST.

Although no prior research has been conducted on the use of BST to teach online safety skills (e.g., safety responses to lures presented over the internet), research has shown that BST and IST are effective for teaching safety skills for abduction prevention, a similar skill set in which a participant must respond safely to a lure from a stranger. The researchers believed BST would be effective for teaching online gaming safety skills due to their parallel to abduction prevention safety responses. Furthermore, due to the online environment of internet gaming, the researchers believed BST conducted over online video conferencing would be appropriate and acceptable to parents. Due to the prevalence of online gaming and the potential risk involved related to strangers luring children through the internet, it is important to teach children how to respond safely in such contexts. To the researchers' knowledge, no study has evaluated BST to teach children how to respond safely when presented with a lure during an online game. Therefore, the purpose of this study was to evaluate remote BST and caregiver-implemented IST to teach children online gaming safety skills.

CHAPTER 2:

METHOD

Participant and Setting

The researchers recruited one typically-developing 9-year-old boy, Clark, and his mother; the researchers determined that Clark did not have an intellectual disability based on parent report. Clark was recruited because he had previously used a smart phone, tablet, or computer to play the online video game “*Among Us*.” The Clark’s mother verified her child’s reading level and typing skills to confirm that Clark was able to read and send messages using text chat while playing an online video game. The researcher obtained Clark’s mother’s permission for Clark to speak with other unknown players online (i.e., research assistants) as part of the study and ensured the “free chat” setting was enabled on Clark’s game account so he could use text chat to type messages to other players. The researcher recruited Clark and his mother by posting a study flyer on social media. After Clark’s mother signed the consent form, the researcher obtained verbal assent from Clark. During this verbal assent meeting, the researcher did not tell Clark the true purpose of the study as this would have affected Clark’s responding; the researcher told Clark the purpose of the study was to observe how children interacted with other players while playing online video games. This study was approved by the IRB at the University of South Florida. Clark and his mother were debriefed 3 days after the completion of the final follow-up assessment. During the debriefing process, the researcher explained the true purpose of the study to Clark (i.e., to assess the effectiveness of BST for teaching children how to safely respond to lures from strangers while playing online video games); the researcher also explained they had

not been playing with true strangers and Clark was never in true danger while participating in the study. The researcher emphasized that the study was completely finished and if Clark encountered any lures in the future, they would be real and he should engage in the safety skills he learned in this study.

All training and assessment sessions occurred remotely while Clark was at home with his mother present. The researcher conducted the training session remotely over the online video conferencing application Microsoft Teams. In-situ assessments took place virtually in the *Among Us* game “lobby,” which is an online room where a player’s character waits for others to join before the start of a game and between games. The researcher and research assistants (RAs) played games of *Among Us* with Clark between and during in-situ assessments.

Materials

The researcher, RAs, and Clark had access to a computer with internet for remote training sessions; Clark and researchers had access to either a smart phone, tablet, or computer with connection to the internet to access *Among Us*. *Among Us* is a game in which players are split into crewmates and imposters, and the crewmates must work together to figure out who are the imposters. The imposters’ goal is to eliminate all the crewmates without getting caught. *Among Us* is free for smart phones and tablets, and costs \$5 to play on a computer. For use in the intervention, the researcher developed a training video that modeled the safety skills for Clark. For use in training Clark’s mother to respond correctly during assessments and intervention sessions, the researcher developed a video modeling proper implementation of IST for her and the proper responses to Clark’s behavior during assessments. The researcher developed task analyses for remote BST and caregiver-implemented in-situ training; the researcher utilized these

tasks analyses to collect treatment integrity data and provided them to Clark's mother as part of teaching her to participate in remote BST and IST (refer to Appendices A and B).

During in-situ assessments, Clark's mother used a smart phone to call the researcher for the purpose of collecting data (including interobserver agreement [IOA] data) on Clark's behavior and IST treatment integrity data. The researcher and secondary observers utilized electronic data sheets or printed datasheets with a writing utensil to record Clark's responses and calculate IOA (refer to Appendix C). The researcher provided Clark's mother with abbreviated social validity and side effects questionnaires (Appendix D) weekly and complete social validity and side effects questionnaires after the completion of the study (Appendix E).

Target Behaviors and Data Collection

The target behaviors consisted of avoidance, escape, and reporting in response to a lure from a stranger in the game requesting personal information. The avoidance response was not responding to (i.e., ignoring) the lure presented by a confederate. The escape response was exiting from the game lobby within 30 s of the lure being presented. The reporting response was telling a caregiver about the lure within 20 s of exiting the game lobby. The researchers scored the target responses on a 4-point scale. A 0 indicated Clark responded to the lure in the chat. Any response to the confederate equated a 0, regardless of whether the response contained personal information related to the lure. A 1 indicated Clark did not respond to the lure in the chat but did not exit the game lobby within 30 s of the lure being presented. A 2 indicated Clark did not respond to the lure in the chat, exited the game lobby within 30 s of the lure being presented, but did not tell his mother about the lure within 20 s after exiting the lobby. A 3 indicated Clark did not respond to the lure in the chat, exited the game lobby within 30 s of the lure being presented, and told his mother within 20 s of exiting the lobby.

Assessment

To establish rapport with Clark and so lures during in-situ assessments seemed believable, “game sessions” with the researcher and RAs occurred before and after training and did not always include the presentation of lures. A game in *Among Us* lasts an average of 7 to 15 min. Each game session with Clark included three to four games, lasting 30 min to 1 hour. Opportunities for the researcher to present a lure occurred in the game lobby between games; the researchers decided that in order to make the game sessions seem believable, the ratio of total number of opportunities when lures were presented to the total number of opportunities when lures were not presented would be 1:3. In this way, Clark would not come to expect a lure when he played the game.

To begin a game session, the researcher created a private lobby in *Among Us*. The researcher obtained a code to invite other players to the game lobby. The researcher gave the code to RAs so there were at least four players in the game lobby. RAs changed their username and appearance before each game session so Clark believed he was playing with random players, besides the primary investigator, each game session. Once the researcher and RAs were ready, the researcher texted the private lobby code to Clark’s mother so Clark could join the game. When playing the game, the researcher and RAs let Clark’s team win at least half the time so that playing with the researcher and RAs became highly reinforcing. When in the lobby and in the game, the researcher and RAs provided minimal chatting and praise to Clark and to one another, so Clark contacted safe, reinforcing interactions. The researcher and RAs provided at least three positive interactions per game to another player (e.g., “nice job,” “good catch,” etc.).

During a game session with an in-situ assessment, a lure was presented without Clark’s knowledge that an assessment was occurring. The RAs acted as unknown confederates. When

the group was in the lobby waiting for the game to start, a RA typed a lure into the chat box directed at Clark. The lures asked for personal information, such as where Clark lived or how old he was. A full list of lures is included in Appendix F; lures were chosen at random from the list during in-situ assessments. The researcher and RAs did not provide any feedback or consequences contingent on Clark's responses. The game session continued as usual if Clark did not engage in the correct responses; the confederate typed that they had to leave and exited the game if Clark responded or did not leave the game within 30 s of the lure being presented. All players ignored Clark if he provided personal information or responded to the lure. Clark's mother thanked Clark if he reported the lure to her. The researcher trained Clark's mother to provide consistent praise (i.e., "Thank you for telling me. You did the right thing by not talking to strangers online. That's the best way to stay safe.") to Clark following correct responding. If Clark exited the game, the researcher texted Clark's mother to ask if Clark wanted to continue playing; the researcher did not mention the lure to Clark and all RAs changed their usernames and appearances before joining the new game lobby.

During assessments, the researcher recorded whether Clark responded to the lure and whether he left the game. Clark's mother was on her phone with the researcher and secondary observer during the assessment so they could hear the child's reporting response.

Interobserver Agreement

The researcher assigned an RA as a secondary observer to collect data during 100% of in-situ assessments. Before a lure was presented, the researcher created a conference call with a secondary observer and Clark's mother so the reporting response could be heard as it occurred; the researcher let Clark's mother know when the lure was about to be presented so she could be prepared. Once the confederate presented a lure, the data collectors recorded data on the Clark's

safety responses. The data collectors recorded the specific lure that was used on the data sheet so it would not be used again. An agreement was recorded if the researcher and secondary observer both indicated that a response did or did not occur. A disagreement was recorded if the researcher indicated that the behavior did not occur while the secondary observer indicated that it did, or vice versa. IOA was calculated by dividing the number of agreements on the three target responses by the sum of the agreements and disagreements. The percentage of agreement was determined by multiplying the result by 100.

Treatment Integrity

The researcher recorded treatment integrity data for 100% of BST and in-situ training sessions; a secondary observer recorded treatment integrity data on the researcher's implementation of BST and the researcher recorded treatment integrity data on Clark's mother's implementation of in-situ training. The researcher developed and utilized a task analysis with yes or no questions to assess treatment fidelity. The observer recorded whether a step in the task analysis occurred by checking yes, no, or not applicable (i.e., N/A) boxes on the data sheet. Treatment integrity was calculated by dividing the number of correct training behaviors exhibited in a training session (i.e., the number of boxes checked "yes") by the total number of correct behaviors possible (i.e., the sum of boxes checked "yes" and "no"). The percentage of treatment integrity was determined by multiplying the result by 100. The treatment integrity data sheets are provided in Appendices A and B.

Social Validity and Side Effects Questionnaire

The researcher emailed Clark's mother social validity and side effects questionnaire at the end of the study. The questionnaire included items regarding her satisfaction with Clark's participation in the study and any negative side effects he might have experienced. The

questionnaire was a modified version of the questionnaire provided in Johnson et al. (2005). The researcher emailed abbreviated side effects questionnaires to Clark's mother weekly. The questionnaire included three questions regarding any side effects Clark may be experiencing following his participation in the assessments and game sessions that week, and one open ended question where Clark's mother could include written feedback on her child's behavior or comments if desired. The abbreviated questionnaire is provided in Appendix D and the complete questionnaire is provided in Appendix E.

Experimental Design and Procedures

The researchers planned to utilize a nonconcurrent multiple-baseline-across-participants design, but only completed the experiment with one participant. The researcher conducted in-situ assessments during baseline to assess Clark's level of correct responding before training. After baseline data were stable, the researcher began BST over online video conferencing calls with Clark. The researchers planned to stagger training across participants; once training produced an increase in performance with Clark, researchers would begin training with the next participant. Once Clark completed training, the researcher conducted in-situ assessments to evaluate the efficacy of remote BST. Clark's mother implemented in-situ training if needed following the BST phase. The researcher conducted follow-up in-situ assessments 2 weeks after the completion of training and assessments.

Baseline

The researcher collected baseline data for Clark using in-situ assessments. The researcher and Clark's mother did not deliver feedback or consequences contingent on Clark's responses during assessments, except to thank the participant if the participant reported the lure.

Remote Behavioral Skills Training

The researcher utilized BST to teach Clark online gaming safety skills. The researcher first invited Clark and his mother to an online video conference. The researcher added an RA to the video conference call so they could record treatment integrity data. The researcher began remote BST by providing Clark with information on the types of lures that could occur when online (with numerous examples) and instructions on the three safety responses (i.e., ignore the lure, exit the game, and tell an adult). The researcher explained the importance of these responses. For the modeling component, the researcher shared the modeling video with Clark and his mother (this can be obtained by emailing the researcher at chovetsantacruz@usf.edu). The video consisted of a screen recording showing a child playing *Among Us* and a stranger presenting a lure. The player in the video did not respond to the lure and exited the game immediately. The video then showed the child getting up from their device and telling their parent about the lure and the parent thanking the child. The video was narrated by the researcher and showed examples of the child responding safely to three different lures. For the rehearsal component, the researcher prompted Clark to join a private *Among Us* lobby with the researcher and RA. The researcher began the role play by telling Clark to pretend as if the researcher was a stranger and to perform the safety skills; the researcher then presented a lure. If Clark exhibited all the target responses, the researcher provided descriptive praise. Clark's mother praised Clark's reporting response. If Clark did not exhibit all the target responses or engaged in incorrect responses, the researcher provided corrective feedback consisting of further instruction to prompt Clark to engage in the correct responses. The researcher continued to have Clark rehearse the responses until he correctly performed all safety responses during three consecutive role plays.

The researcher conducted an in-situ assessment 1 to 3 days after the completion of the first remote BST session. If Clark engaged in the target behaviors and scored a 3, the researcher conducted another in-situ assessment in 1 to 3 days. The researcher conducted in-situ assessments until Clark reached the mastery criterion of three consecutive scores of 3. If Clark scored less than a 3 during an in-situ assessment, the researcher initiated a booster session. Booster sessions were identical to the first remote BST session. After two booster sessions, the next score below a 3 during an in-situ assessment resulted in the initiation of IST as described below.

Caregiver-Implemented In-Situ Training

The researcher provided Clark's mother with detailed instructions (including a TA) and a modeling video showing how to implement in-situ training. The researcher asked Clark's mother to watch the video and then had a virtual meeting with the caregiver to discuss IST. During an in-situ assessment where IST may have been necessary, Clark's mother remained in the same room or neighboring room as Clark and pretended to be busy (e.g., cleaning, laundry, on the phone, etc.). This was so Clark's mother would be able to "witness" Clark's incorrect responses if they occurred. While on the phone with Clark's mother, the researcher told her the moment the lure was presented, along with a description of Clark's responses. Clark's mother waited 20 s and if Clark did not report the lure, she approached him and immediately implemented in-situ training. Clark's mother also implemented in-situ training if Clark reported the lure but responded to the lure and/or failed to leave the game. Clark's mother looked at Clark's screen and pointed out the lure before initiating in-situ training. Clark's mother reminded Clark of the three safety responses. She then had him rehearse the safety skills. Clark's mother prompted Clark to go back to his gaming device and pretend like a lure was presented to them; she walked

out of the room Clark was in so he could also rehearse the reporting response. Clark rehearsed ignoring a lure, exiting the game, and running to tell his mother about the lure. If Clark engaged in all the correct responses, his mother provided praise. If Clark responded incorrectly, his mother provided corrective feedback and modeled the correct responses. Clark rehearsed the responses with his mother until he engaged in all three correct responses three times in a row.

Follow-Up

The researcher conducted follow-up in-situ assessments with Clark to assess maintenance of the online safety skills. The researcher conducted these assessments 2 weeks after the completion of training and assessments. Clark's mother conducted in-situ training if Clark did not engage in all three target responses; the researcher provided the video modeling implementation of IST before the follow-up assessment so Clark's mother was prepared to conduct IST if needed.

CHAPTER THREE:

RESULTS

Figure 1 shows Clark's responses across the conditions of the study. During baseline, Clark scored 1's and 0's. During the first in situ assessment, Clark did not respond to the lure but did not leave the game within 30 s of the lure being presented. Clark scored 0's in the following 2 probes because he responded to the lures (he stated "Why do you need to know" during probe 2 and "Why are you asking" during probe 3). Following the implementation of BST, Clark met mastery criterion by scoring three consecutive 3's. During the 2-week-follow-up, Clark scored a 1 because he did not respond to the lure but did not leave the game lobby within 30 s; his mother implemented IST immediately following the incorrect responding. Another follow-up assessment was conducted 3 days later and Clark scored a 3. The researcher and secondary observers obtained 100% IOA across each in situ assessment. The researcher implemented BST with 100% treatment integrity; Clark's mother conducted one IST session with 90% treatment integrity.

Overall, Clark played eight game sessions with a lure and six game sessions without a lure. There were 33 opportunities for lures to be presented across Clark's participation in the study. The ratio of total number of opportunities when lures were presented to the total number of opportunities when lures were not presented was 8:25. The lures presented were as follows: "how old are you?", "are you a boy or a girl?", "where are you from?", "do you have a TikTok?", "where do you go to school?", "what year were you born?", "do you live in Florida too?", "what is your real name?". To direct lures at Clark, lures started with the color of his character or his character's username. Data were taken on the latency between questions asked in

the game lobby and Clark's responses to identify the typical amount of time it took Clark to respond to other players. Clark took 7 to 15 s to respond to general statements or questions made by other players such as "good game" or questions regarding the settings of the game (e.g., "how many imposters should we have?", "is the movement speed fast enough?"). Clark took 5 and 17 s to respond to lures delivered by confederates.

The results of the weekly and final social validity and side effects questionnaires indicated there were no negative side effects due to Clark's participation in the study. Clark's mother reported that she strongly disagreed that Clark was now more likely to refuse to play games online following the study, and said he is "much better equipped with the tools to know how to avoid potentially dangerous situations." She disagreed that Clark is now more hesitant to play games online without a trusted adult present and said he "knows what to do without his parents present." She strongly agreed that Clark is now more likely to express concerns about the safety of online games, strangers online, and personal safety, clarifying that "he told me about things in the past but with this study he became more aware and would tell me even quicker than before." Although on the questionnaire she agreed to the statement that Clark is now more likely to talk about his fear of strangers outside of online games, she said, "he was never fearful before and during the study," "he responded maturely without fear," and "I know he will continue this way in the future as well." When asked to provide other changes in her child's behavior, Clark's mother wrote he is "more observant of conversations in the game chat, specifically noticing if someone was asking him a personal question/talking to him." Clark's mother reported she was very pleased her son participated in the study, reported she was very satisfied with the way the researchers communicated what was going on throughout the study, and reported she felt more

comfortable with her child playing games online with strangers after his involvement in the study.

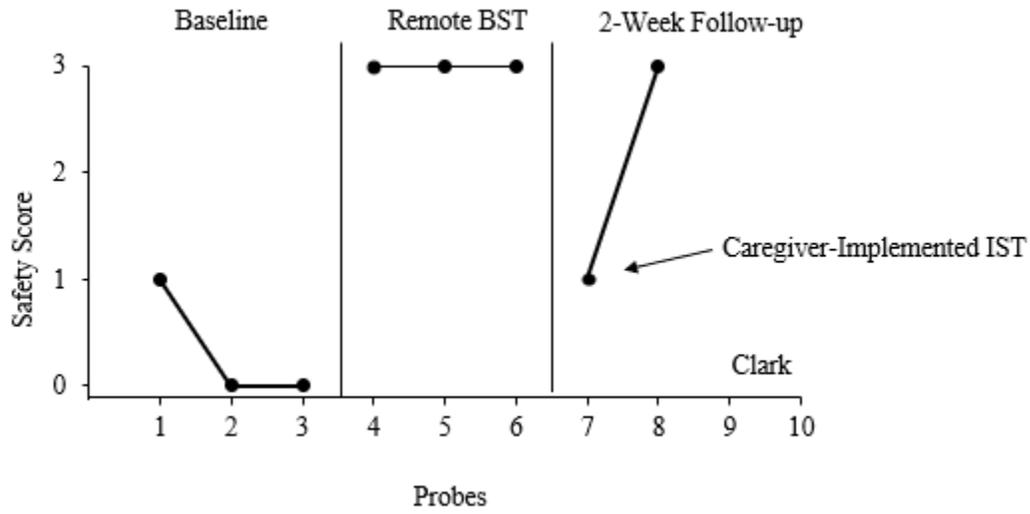


Figure 1. This graph illustrates Clark's online safety skill scores during in-situ assessments in baseline, remote BST, and follow-up phases.

CHAPTER 4

DISCUSSION

The results of the present study illustrate the effectiveness of remote BST and caregiver-conducted IST for teaching online gaming safety skills to the child participant. These findings are consistent with results of research pertaining to the use of BST to train abduction-prevention skills and IST to enhance skill maintenance (Johnston et al., 2006), as well as the effectiveness of caregiver-implemented IST (Gross et al., 2007). This is the first study to examine the potential of utilizing BST to teach safety skills pertaining to online video games, and the results show the potential for future research in this environment. Although Clark scored two 0's in the baseline phase, suggesting he was engaging in unsafe behavior online, he did not give any personal information when he spoke to the person presenting the lure. It is possible Clark had prior, informal training (e.g., by his parents) to not give away any personal information to strangers, even when online.

The most substantial strength of this study was the remote nature of the training and assessments. The researcher never met with Clark, his mother, or the RAs in person; the researcher trained the RAs remotely, met with Clark remotely online during game sessions, and spoke with Clark's mother remotely over the phone or on video conference apps for training or data collection. This highlights the efficiency, contextual fit, and safety of the training program, especially in today's age where the dangers of infecting others with COVID-19 is still present. The remote nature had other benefits as well. Scheduling training or game sessions was less challenging because the researcher and RAs could participate in the study from any setting

instead of having to meet at a predetermined location; there were also fewer time constraints because the remote nature allowed for more flexibility for meeting times. Clark and his caregiver participated in training and game sessions from the comfort of their homes; this was also beneficial due to the number of meetings that was needed to complete the study. When there were not enough RAs available to play in a game session, the researcher or an RA could play *Among US* on two or more devices at the same time to add more players to the game lobby.

The researcher took many steps to ensure the deception was successful by randomizing as many variables as possible in the game lobbies to make the child participant believe he was playing with strangers. The RAs changed their name and appearance before they initially entered the game lobby for a game session; if a RA was disconnected from the lobby, they changed their name and appearance again to make it seem like they were a new stranger. Each game session, the researcher varied the number of players that were in the game lobby; the number of players changed throughout game sessions, such as an RA leaving the game to decrease the number or joining the game to add a player. The researcher also varied the number of players who were in the lobby when Clark joined for a game session. For example, sometimes Clark was the first player in the lobby (besides the researcher), sometimes he joined the lobby when a few players were in, and sometimes Clark was the last player to join. This randomization of variables closely resembled the environment of online video games in everyday life where the number of players can change frequently for a variety of reasons, thus making it unlikely Clark would sense that the game was staged as part of the experiment. After Probe 5, Clark's mother told the researcher that Clark made a comment the "pink is always sus," meaning the pink player always seemed suspicious. To avoid the possibility of Clark realizing he was not playing with true strangers, the researcher began to systematically vary the manner the RAs wrote messages in the lobby across

game sessions. For example, RAs wrote their messages in predetermined manners during a game session, such as typing in all capital letters, all lowercase letters, using punctuation or no punctuation, using certain phrases or slang, abbreviated words, etc. After these changes were implemented, Clark did not make any other comment about a specific character's behavior.

Despite the apparent success of the training, there were several limitations that may have affected the overall results. First, there was a lack of experimental control due to conducting the study with only one participant; the true effectiveness of the training is unknown because the multiple-baseline-across-subjects design was not followed. A reason for this was the time constraints in place to complete the experiment. Typically, 1 to 2 game sessions occurred per week and game sessions with lures (i.e., when data was collected) were spaced out as much as possible. Unlike abduction-prevention experiments where a minimal number of probes is needed to collect data, many game sessions were needed in this study to obtain all the data because we had to intersperse many games without lures so the game did not become discriminative for a lure. In the future, at least three participants should participate in the study to establish experimental control to demonstrate the effectiveness of the training.

Second, Clark's mother did not implement IST with full treatment integrity because of inadequate training by the researcher. The researcher provided Clark's mother with the video model and task analysis and asked her to let him know if she had any questions. Before the follow-up assessment, the researcher asked Clark's mother again if she had any questions and she said no. The researcher should have met with Clark's mom in a video conference to watch the video model with her, role play IST, and answer any questions she had in the moment. Despite the lack of sufficient training, Clark's mother implemented IST with 90% treatment integrity; she exhibited each training behavior, but she only had Clark rehearse the safety skills

twice instead of the full three times. Furthermore, Clark scored a 3 in the subsequent follow-up assessment, indicating the effectiveness of the IST session.

Third, it is not known if Clark's safety skills score of 1 was a valid score for the 2-week follow-up assessment because it is possible Clark did not see the lure. Clark did not score a 3 in the first follow-up probe because he stayed in the lobby following the presentation of the lure. During this assessment, the RA who was going to serve as the confederate was disconnected from the game due to technical difficulties. In the moment, the researcher decided he would serve as the confederate on the second device he was using. Before the lure was presented, the researcher called the secondary observer and caregiver to listen to the reporting response and prompt the caregiver to implement IST if needed. With the second device, the researcher began a conversation with Clark to make sure he was focusing on his phone. The lure, "Green are you from Florida too?" was presented after a brief delay in the conversation between Clark and the researcher's confederate character. Clark did not respond to the lure but did not leave the game lobby within 30 s. His character remained still for 20 s, and then was observed to walk to the customization table (i.e., where a player can change his character's appearance), change colors from green to black, and continued to not respond to the lure. The researcher prompted Clark's mother to implement IST; she approached him and told him that the researcher told her a stranger asked him a personal question. Clark responded that a stranger did not ask him anything, but then he checked his game (as evidenced by his verbal behavior) and immediately left the game. Clark told his mother that he did not see the lure because the game does not give notifications when messages are sent. Clark's mother continued to implement IST as the researcher listened remotely; she did not implement IST with full treatment integrity because she only rehearsed the safety responses twice, not three times as directed in the training video.

Regardless of the lack of perfect implementation, Clark scored a 3 during the next follow-up probe, indicating the potential effectiveness of the IST session.

Clark's statements could indicate a few possibilities. It is possible that Clark did not see the lure within the 30 s it was presented; when a message is sent in the game, a small red dot appears on the upper right side of the screen and a quiet "beep" occurs. Both stimuli are not very noticeable unless a player has their volume set to loud, are watching their screen, or are already looking at the chat box. Despite this possibility, it is not known if Clark was telling the truth about not seeing the lure. One reason to believe this is Clark changed his character's color after the lure was presented. It is possible that Clark changed his character's color to avoid the question directed at "Green"; however, Clark had an extensive history of changing his character's appearance while participating in game sessions and changed his appearance at least once every game session. The researchers cannot know for sure why Clark did not engage in the safety responses.

Fourth, the researchers do not know if Clark believed he was playing with strangers during all game sessions. When the researcher explained the true purpose of the study (and that Clark had not been playing with real strangers or presented with real lures), Clark responded, "I had a feeling." Despite this response, Clark's behavior throughout the study did not lead the researcher to believe that he knew of the deception. Clark played each game similarly and spoke with other players the same way each time, he never asked his mother or the researcher questions about the study, and his behavior stayed the same following training other than exhibiting the correct safety responses.

Finally, there were some uncontrollable variables that may have affected the study. Technical difficulties were unavoidable at times, but the researchers worked around these

difficulties as best as possible. Some aspects of the game may have weakened the deception of playing with strangers. When in a private lobby, there is a box labeled “PRIVATE” at the bottom of the screen that all players can see while in the lobby. It is possible Clark noticed this and it led him to believe that he was not playing with true strangers; however, he did not ask why the lobby was private or how strangers were able to join the private lobby. Due to the nature of this study, it was imperative to keep the lobby private so any personal information Clark gave a confederate would not be accessible to a stranger. Another uncontrollable variable was the primary researcher’s presence during game sessions. This may have caused reactivity that affected Clark’s behavior and may have also further weakened the deception, particularly after BST was implemented. However, the primary researcher needed to be in the games because he created the game lobbies and sent the private codes to Clark’s mother and the RAs. Future research should seek to keep the researcher out of the game. Lastly, there was only so much the researchers could do to vary the number of players in the game. At least four players were needed to play the game and there were not enough RAs to have more than eight players in the lobby at one time (including the researcher and one RA on two devices at the same time).

There are many potential extensions for future research pertaining to BST and online gaming safety skills. Many different games can be used, particularly online video games where players speak with one another using a microphone. Researchers would need to solve potential challenges that would surface by using voice chat, such as having different confederates with distinctly different voices or by using a voice changer. In some games, players can message other players privately or add players as friends; both of these variables could be included in future studies to teach children how to safely respond to lures presented in these ways. In the future, the study can be completed with a video game that has a smaller lobby so not as many research

assistants are needed at one time. Popular games such as Fortnite and Call of Duty: Warzone have 100 player lobbies, but teams of two to four players talk with each other and other players cannot hear what is said. This would protect the participant in case they give away personal information, as well as significantly minimize the number of RAs needed to serve as confederates. Researchers should analyze and systematically manipulate the ratio of lure presentations during game sessions to learn which ratio closely matches real life circumstances. The ratio in this study was 8:25, but it is unknown if this was the best ratio to maintain the deception and make in situ assessments seem more realistic.

Future researchers should vary the types of lures used in assessments, such as those described by Miltenberger and Olsen (1996). It would be valuable to specifically test the effectiveness of BST for training safety responses to incentive lures because in most online video games today, there is the ability to trade items with players that are purchased with real money or in-game currency (e.g., ROBLOX). It would be interesting to see how participants react to lures that are presented with the offer of in-game currency, cosmetics, or special items. Future researchers could also train different behaviors that are functionally equivalent to the avoidance, escape, and reporting responses. Instead of exiting a game completely or reporting the lure to a caregiver, the responses could be to “kick” the confederate from the lobby (if the participant is in charge of the lobby), block the confederate, or report their account. These three behaviors require less response effort and are closer to what a player may do in a real-life scenario.

Research should extend to different demographics, such as children or young adults with autism or other developmental disabilities who are at risk of lures on online video games. Future researchers could have peers provide BST to participants, implement BST for a group of participants, or have parents or teachers implement BST. In the current study, Clark may have

thought it was strange that lures were only directed towards him. In future research, confederates could direct lures at other RAs and the RAs could model correct or incorrect responses for the participant. Overall, this is a very promising introduction into this intersection of the online world and ABA, and it is exciting to think of the possibilities for future research.

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APPENDICES

Appendix A: BST Treatment Integrity Checklist

BST Treatment Integrity Checklist

	Step	Yes	No	N/A
	1. Log in to online video conferencing application and invite participant to call			
Instructions	1. Explain importance of online safety and keeping personal information safe			
	2. Provide 5 examples of lures and where they can be presented online (in games, in lobbies, over text chat, over voice chat)			
	3. Present specific safety responses to participant. Tell child to not respond, exit the game, and tell a parent			
	4. Explain the importance of the responses			
Model	1. Present video model to the participant			
	2. Talk with participant about the video model’s responses and explain how the model’s responses were correct			
Rehearsal	1. Create <i>Among Us</i> private lobby and invite participant			
	2. Provide the participant with a scenario by presenting a lure and telling the participant to act as if the researcher is a stranger			

Step		Yes	No	N/A
3.	Ask participant to act out the safety skills in response to the lure			
4.	If the participant engages in correct responses (all steps correct) provide praise			
5.	If the participant does not engage in one or more correct responses:			
	i) Immediately stop rehearsal			
	ii) Provide instructions for correct response			
	iv) Have the participant rehearse the responses with feedback until all steps are correct			
6.	Rehearse the target responses with feedback using three different lures until the participant responds correctly in three consecutive scenarios			
	Scenario 1			
	Scenario 2			
	Scenario 3			

Appendix B: Caregiver-Implemented IST Treatment Integrity Checklist

Caregiver-Implemented IST Treatment Integrity Checklist

Step		Yes	No	N/A
1.	Caregiver starts videotaping participant or calls researcher on the phone when researcher told them lure was about to be presented			
2.	Caregiver initiates IST if participant did not engage in all three safety skills:			
	i) Caregiver enters room if participant does not report lure to them within 20 seconds of lure being presented			
	ii) If participant responds to the lure, caregiver enters room within 15 seconds of researcher texting parent about incorrect response			
	iii) If participant does not leave the game, caregiver enters room within 15 seconds of researcher texting parent about incorrect response			
3.	If participant is still in game lobby, caregiver prompts the participant to exit the game			
4.	Caregiver reminds the participant about the three safety skills			
5.	Caregiver tells participant they have to practice the skills until they get it right			
6.	Participant rehearses the target responses with the caregiver until the participant exhibits all correct responses			
7.	Caregiver provides praises when the participant exhibits all the safety skills during a rehearsal			
8.	Caregiver provides corrective feedback to the participant if they respond incorrectly			

9.	Participant rehearses the target responses with the caregiver giving feedback using different lures until participant responds correctly in three consecutive scenarios			
	Scenario 1			
	Scenario 2			
	Scenario 3			

Appendix C: Data Sheets

Instructions for In-Situ Assessment Data Collection

The target responses and key are provided in these instructions for data collection and scoring. The section labeled “notes” is available for any relevant information pertaining to in-situ assessments (e.g., participant responded to lure with personal information, participant responded to lure after 10 seconds, participant reported lure to parent after 20 seconds, etc.).

Target responses:

Avoidance: Participant did not respond to the lure in the chat box.

Escape: Participant exited from game lobby within 30 seconds after the lure is presented.

Reporting: Participant reported the lure to a caregiver within 20 seconds after exiting the game lobby.

Key:

0 = Participant responded to the lure in the chat (any response other than stating the participant cannot talk to the confederate)

1= Participant did not respond to the lure in the chat, but did not exit the game lobby within 30 seconds after the lure was presented

2= Participant did not respond to the lure in the chat, exited the game lobby within 30 seconds of the lure being presented, but did not report the lure to a caregiver within 20 seconds after exiting the game lobby

3= Participant did not respond to the lure in the chat, exited the game lobby within 30 seconds of the lure being presented, and reported the lure to a caregiver within 20 seconds after exiting the game lobby

In-Situ Assessments Data Sheet (Primary Observer)

Participant: _____

Probe #	Date and Time	What # game in the session?	Lure Presented	Did they respond to the lure in the chat?		Did they exit the game lobby within 30 seconds of the lure being presented?		Did they report the lure to a caregiver within 20 seconds of exiting the game lobby		Score (0-3)	Observer Initials	IOA
				Yes	No	Yes	No	Yes	No			
				Yes	No	Yes	No	Yes	No			
				Yes	No	Yes	No	Yes	No			
				Yes	No	Yes	No	Yes	No			
				Yes	No	Yes	No	Yes	No			
				Yes	No	Yes	No	Yes	No			

Notes:

In-Situ Assessments Data Sheet (Secondary Observer)

Participant: _____

Probe #	Date and Time	What # game in the session?	Lure Presented	Did they respond to the lure in the chat?	Did they exit the game lobby within 30 seconds of the lure being presented?	Did they report the lure to a caregiver within 20 seconds of exiting the game lobby	Observer Initials
				Yes No	Yes No	Yes No	
				Yes No	Yes No	Yes No	
				Yes No	Yes No	Yes No	
				Yes No	Yes No	Yes No	
				Yes No	Yes No	Yes No	

Notes:

Appendix D: Abbreviated Side Effects and Social Validity Questionnaire

Side Effects and Social Validity Questionnaire

Instructions: Please circle, highlight, or write your answers

1. After this week, my child is now more likely to refuse to play games online.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

2. After this week, my child is now more hesitant to play online without a trusted adult present.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

3. After this week, my child is now more likely to talk about their fear of strangers outside of online games.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

4. If there were any changes in your child's behaviors, or you have additional comments, please include them here:

Appendix E: Complete Side Effects and Social Validity Questionnaire

Side Effects and Social Validity Questionnaire

Instructions: Please circle, highlight, or write your answers

1. Compared to before this study, my child is now more likely to refuse to play games online.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

If a change occurred, please describe briefly:

2. Compared to before this study, my child is now more hesitant to play online without a trusted adult present.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

If a change occurred, please describe briefly:

3. Compared to before this study, my child is now more likely to express concerns about the safety of online games, strangers online, and personal safety.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

If a change occurred, please describe briefly:

4. Compared to before this study, my child is now more likely to talk about their fear of strangers outside of online games.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

If a change occurred, please describe briefly:

5. Other changes I noted in my child's behavior are:

Please describe or mark N/A if no change was observed

6. How pleased are you that your child participated in the study?

- Very Pleased
- Pleased
- Neutral
- Unpleased
- Very Unpleased

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

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

8. Do you feel more comfortable with your child playing online with strangers after their involvement in this study?

- Very comfortable
- Comfortable
- No change
- Uncomfortable
- Very uncomfortable

9. Did you terminate your child's participation in the study?

- Yes
- No

If yes, please explain why:

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

Appendix F: List of Lures

- Age questions
 - How old are you?
 - When is your birthday?
 - What month were you born in?
 - What day were you born on?
 - What year were you born in?
 - Are you in middle school?
 - Are you in elementary school?
 - Are you in X grade, too (depends on grade of participant)?
- Gender questions
 - Are you a boy or girl?
 - Are you a male or female?
 - M or F?
 - Are you a x, too (depends on gender of participant)?
- Location questions
 - Where do you go to school?
 - Where do you live?
 - Where are you from?
 - What state are you in?
 - Are you from the USA?
 - Do you go to x location ever (near the school they go to)?
 - Do you live in Florida, too?
- Personal information
 - What is your name?
 - What is your full name?
 - What is your last name?
 - What's your phone number?
 - What's your parents phone number?
 - What is your mom's name?
 - What is your dad's name?
 - Do you have social media?
 - Do you have Snapchat?
 - What's your Instagram?
 - Do you have Facebook?

Appendix G: IRB Approval Letter



APPROVAL

October 14, 2021

Henry Chovet Santa Cruz
15113 Buckhorn Court
09A-202B
Lutz, FL 32559

Dear Henry Chovet Santa Cruz:

On 9/17/2021, the IRB reviewed and approved the following protocol:

Application Type:	Initial Study
IRB ID:	STUDY003070
Review Type:	Committee Review
Title:	Evaluating Behavioral Skills Training to Train Online Gaming Safety Skills
Approved Protocol and Consent(s)/Assent(s):	<ul style="list-style-type: none">• Protocol, Version #1, October 11, 2021;• Child Verbal Assent, Version #1, August 11, 2021;• Combined Parent & Parental Perm., Version #1, October 11, 2021; <p>Approved study documents can be found under the 'Documents' tab in the main study workspace. Use the stamped consent found under the 'Last Finalized' column under the 'Documents' tab.</p>

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. Verbal assent will be obtained as outlined in the IRB application.

Institutional Review Boards / Research Integrity & Compliance

FWA No. 00001669

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The IRB approved the protocol from 9/17/2021 to 9/17/2022. Within 45 days of 9/17/2022, submit a continuing review/study closure request in BullsIRB by clicking Create Modification/CR.

If continuing review approval is not granted before the expiration date of 9/17/2022, approval of this protocol expires on that date.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

Jennifer Walker
IRB Research Compliance Administrator

Institutional Review Boards / Research Integrity & Compliance

FWA No. 00001669

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