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Behavioral Skills Training to Teach Online Safety Responses to Youth with Autism Spectrum Disorder

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Abstract

Youth with autism spectrum disorder (ASD) frequently play video games. Social deficits underlying the disorder make this population more vulnerable to safety threats online than neurotypical children. Behavioral skills training (BST) has proven to be an effective methodology to teach safety skills to children with ASD to use in response to abduction lures. The purpose of this study was to evaluate the effectiveness of using BST to teach a youth with ASD safety skills to use in response to lures presented to him as he played an online video game. The results were consistent with the findings of previous studies using BST to teach safety skills. The participant's safety scores increased during BST and he earned the maximum safety score across consecutive sessions. However, responding did not maintain during posttest assessments. In-situ training (IST) was included during the final posttest assessment and the results suggested that in-situ training could be a promising intervention to increase maintenance.

Keywords: autism spectrum disorder (ASD), behavioral skills training (BST), in-situ training (IST), online safety, safety skills. video games

Behavioral Skills Training to Teach Online-Safety Responses to Youth with Autism Spectrum Disorder

Today nearly all teens play video games, and over 4.5 billion people worldwide connect to the internet regularly (Internet World Stats, 2020). Players can select from a vast array of video games and play them on various screen-based media (e.g., home consoles, PC games, mobile games, touch-screen devices, online multi-player games, virtual reality, etc.). Most devices that support video games also access the internet and connect players around the world. A 2019 census estimated youth in the United States (ages 8-12) engaged in an average of 4.44 hours daily using screen-based media (not including time used for academic purposes), and 64% of children reported playing video games for 1.28 hours per day (Rideout & Robb, 2019). This evidence illustrates the major role video games play in the life of most teens.

Electronic media, including video games, is also extremely popular with youth diagnosed with autism spectrum disorder (ASD). Youth with ASD use electronic media even more frequently than neurotypical youth. For example, Mazurek and Wenstrop (2013) evaluated the amount youth with ASD (ages 8-18) used screen-based media in contrast to their neurotypical peers. The ASD group spent significant amount of their leisure time (62%) with electronic media than they did engaged in any other activity. They also spent significantly more time gaming and less time engaging in screen-free activities than the neurotypical group. Parents estimated youth with ASD spent 4.5 hours every day using electronic media, and played video games at least 2 hours per day, compared to neurotypical youth that spent 87% more time participating in other activities not involving a screen (Mazurek & Wenstrop, 2013). Likewise, teens with ASD visit websites that contain content related to video games more frequently than they visit websites with unrelated content (Kuo et al., 2014).

Video games are an important tool that teens, especially boys, use to socialize. According to Lenhart et al. (2015), most adolescents that play video games, play the games on the internet (75%), and many of these teens (52%) have played the games with strangers online. Additionally, 34% of all teen boys made a new friend while playing a video game online (Lenhart et al., 2015).

Despite the social benefits, youth may potentially be exposed to a variety of safety threats (e.g., cyberbullying, online enticement, sexual solicitation) in this virtual environment. McColgan and Giordano (2005) found the major threats youth face online include: a) exposure to material that is unsuitable or promotes risky behavior, b) harassing or demeaning conversation (i.e., cyberbullying), c) revealing of financial information or participating with activities that are illegal, and d) safety issues (e.g., online enticement and sexual solicitation). Internet predators will groom youth first by engaging in online communications to establish trust before planning to meet the child for a sexual encounter (Wolak et al., 2004). In 2010, 9% of teens (ages 10-17) that were surveyed recounted receiving unwanted sexual solicitations online (Jones et al., 2012).

Even more troubling, individuals with disabilities are universally more susceptible to being victimized. According to the Bureau of Justice Statistics (BJS, 2017), individuals with disabilities were victims of violent crime more than twice as much as the general population in 2015. Additionally, persons with an intellectual and developmental disability (IDD) were more prone to victimization. Variables that have been linked to the cyber-solicitation of youths (e.g., depression, loneliness, and social isolation) are generally found more often with youths with ASD than typically developing youth (Normand & Sallafranque, 2015).

Likewise, children with ASD may be coerced more easily by strangers than neurotypical children due to deficits in communication and social skills that are commonly associated with the disorder (Gunby et al., 2010). For example, one of the defining features of

ASD, outlined in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V), are difficulties communicating and interacting socially across various settings and circumstances. This includes appropriately adjusting behavior and relationships to fit within different social contexts (American Psychiatric Association, 2013).

Effective training is sorely needed to teach safety responses to youth with ASD to use when safety threats are encountered while playing video games online. Jones et al. (2013) systematically reviewed youth prevention programs (e.g., drug abuse, sex abuse, youth violence) and identified the following key components of the most effective evidence-based strategies: a) the curriculum is structured so the materials presented are of high quality and delivered consistently, b) active learning strategies and skill-based learning objectives are utilized, and c) an "adequate dose" of training (i.e., lessons that build upon previous training) with extra learning opportunities is provided.

Jones et al. (2013) also identified and reviewed the well-established internet-safety programs that teach youth online-safety skills for use with threats encountered online (e.g., iKeepSafe, the i-SAFE prevention program, Netsmartz, and WebWiseKids). However, these popular programs are limited because they utilize an informational approach to safety training (i.e., educational messages are delivered, but learners are not given the opportunity to practice the skills that are taught). Similar safety programs for children that address other threats (e.g., discovering a firearm) have been found to be inferior to interventions that give learners opportunities to practice the skills that are being taught.

In-situ assessments have been used by many studies to evaluate the effectiveness of safety-training programs. During an in-situ assessment the experimenter contrives a situation in the subject's natural environment for the purpose of simulating a specific safety threat (Miltenberger et al., 2013). These assessments consistently demonstrate that informational approaches (e.g., viewing a DVD) do not effectively teach safety skills.

An example of a safety-training program that utilizes an informational approach is the National Rifle Association's (NRA) Eddie Eagle Gun-Safe program. Children are played a DVD that instructs the appropriate safety responses to use when a firearm is encountered. The Eddie Eagle program was demonstrated to be an ineffective procedure for training firearm-safety skills because most participants failed to perform the safety responses accurately during in-situ assessments (Gatheridge et al., 2004; Himle, et al., 2004). Likewise, the Safe Side DVD that teaches children abduction-prevention skills, when evaluated using in-situ assessments, also showed the participants failed to demonstrate the correct abduction-prevention responses (Beck & Miltenberger, 2009).

Active learning interventions for risk prevention are characterized by learners practicing the skills until they are performed independently. Active learning approaches have reliably outperformed informational approaches in behavioral assessments of safety skills (e.g., Gatheridge et al., 2004; Himle et al., 2004; Kelso et al., 2007). Behavioral skills training (BST) is an active learning strategy that blends instruction (i.e., description of safety threat and explanation of appropriate responses), modeling (i.e., demonstration of safety skills), rehearsal (i.e., skills practice), and feedback (i.e., corrective feedback and praise for correct responding). To increase the likelihood responding will be controlled by the safety threat, the threat is simulated numerous times. This is done for the purpose of affording the learner multiple occasions to practice the safety responses in its presence. Consequently, the safety threat will function in the future as a discriminative stimulus that will evoke the appropriate safety response in its presence (Miltenberger & Valbuena, 2015).

Numerous studies have found BST is an effective way to teach safety skills. For example, it was employed to train abduction prevention responses (e.g., Marchand-Martella et al., 1996; Poche et al., 1981), abuse prevention responses (e.g., Egemo-Helm et al., 2007), fire safety skills (e.g., Houvouras & Harvey, 2014), firearm safety skills (e.g., Gatheridge et

al., 2004; Hanratty et al., 2016; Himle et al., 2004; Jostad et al., 2008; Lee et al., 2019), help-seeking responses (e.g., Pan-Skadden et al., 2009), pedestrian safety skills (e.g., Harriage et al., 2016), and poison prevention responses (e.g., Dancho et al., 2008).

One of the initial BST studies, conducted by Poche et al. (1981), used an intervention comprised of modeling, rehearsal, and positive reinforcement to train safety responses for abduction lures presented to preschool children. Every child showed significant increases in safety-rating scores (e.g., scores of 0 in baseline increased to the maximum of 6) following BST. One child maintained the safety responses three months after training, while the remaining two children required additional sessions to improve long-term maintenance (Poche et al., 1981). Marchand-Martella et al. (1996) also examined the effectiveness of BST to teach abduction safety responses to preschool age children for multiple abduction lures (e.g., simple, authority, and incentive). All participants displayed increased levels of responding during BST and posttest follow ups (Marchand-Martella et al., 1996).

Giannakakos et al. (2020) completed a comprehensive search of the literature and identified 82 studies of safety-response training methodologies for a variety of potential threats (e.g., abduction prevention, fire safety, gun safety, poison prevention, etc.). The authors concluded BST, especially when combined with in-situ training (IST), is the "most well researched and effective training method for teaching safety responses" (Giannakakos et al., 2020, p. 114).

The relevant research also confirms BST is an efficacious methodology to teach abduction prevention skills to individuals with ASD and other IDD (e.g., Bergstrom et al., 2014; Gunby et al., 2010; Gunby & Rapp, 2014; and Ledbetter-Cho, 2016).

For example, Gunby et al. (2010) employed BST to teach three boys with ASD to give the following responses: a) say "no", b) leave to a safe area, and c) report the incident immediately, when exposed to different abduction lures. All participants in the study

responded correctly during BST and posttest assessments following a month of treatment (Gunby et al., 2010).

Gunby and Rapp (2014) expanded on this line of BST research by presenting abduction lures to children with ASD after "high-probability request sequences" (i.e., requests the children perform frequently and reliably). Safety scores increased for all children following the BST intervention in this study. It should be noted IST was required during post-training for participants to reach the performance criterion (Gunby & Rapp, 2014).

Therefore, the purpose of this study was to broaden the BST literature by extending this research into the domain of online safety. This was accomplished by using a BST procedure, similar to the methodology employed previously in abduction prevention studies, to teach safety skills to a youth with ASD for use in response to threats associated with encountering strangers on the internet. The mock threat presented during this study was an inappropriate request for personal information (IRPI) made by a previously unknown confederate to the participant while he played a video game online. The effects of BST to increase the safety scores of the participants were evaluated.

Method

Participant

The participant selected for this study was a 10-year-old boy diagnosed with ASD. He was receiving intensive behavioral intervention services at the time of the study. The participant met the following inclusion criteria to participate. First, he possessed a sufficient verbal repertoire for the study. He demonstrated this by independently supplying his name, age, and address when requested. Second, the participant was able to follow multi-step instructions. Third, he demonstrated imitation skills, including gross motor actions (e.g., raising hand to notify adult), fine motor actions (e.g., manipulating game controller to stop game), and echoing phrases (e.g., "I need help"). Lastly, the participant's caregivers indicated

he engaged in frequent video game use (i.e., at least 7 hours per week). The participant had not received formal online-safety skill instruction or training prior to the start of the study.

Setting and Materials

All probes and BST sessions were conducted at the center-based clinic where the participant was receiving behavior-analytic services. The materials used during all probe and BST sessions included: a) two PC computers using Microsoft operating systems, b) the video game Plants vs Zombies: Battle for Neighborville that was accessed with a digital subscription to the online gaming platform Origin (Electronic Arts), c) Easy-SMX wireless 2.4g gaming controller with controller-charging cable, d) Microsoft Power Point, e) a cable modem with internet connection (10 Mbps or higher download speed required to support online gaming), f) personal hotspot accessible from a Sprint mobile device.

Dependent Variables and Data Collection

Target Behaviors

The participant was taught the following online-safety responses: a) abstain from providing personal information (i.e., address, name, or current location), b) say “no” to IRPI, c) pause/leave game within 30 s, and d) report the event to an adult within 30 s (e.g., “I need help”). Safety responses were scored on a four-point rating scale, similar to those employed in previous abduction prevention studies (e.g., Gunby et al., 2010; Johnson et al., 2005, 2006). For each observation, the participant was given a score of 0-4, with a point counted for each safety response given. When the participant provided personal information to the confederate a 0 was scored automatically.

Performance during BST (i.e., rehearsal phase) and IRPI probes were scored as follows: 0 = gave personal information; 1 = abstained from giving personal information but did not perform any other safety responses; 2 = abstained from providing information and performed only one additional safety response (i.e., said “no”, stopped the game, or reported

to an adult within 30 s); 3 = abstained from providing information and performed two additional safety responses; 4 = performed all four safety responses (abstained from providing information, said “no”, stopped the game, and reported to an adult within 30 s).

Observer and Interobserver Agreement

The first author served as the principal observer of whether the participant reported the IRPI within 30 s, abstained from providing the requested personal information, said “no”, paused the game, and requested help from an adult. Another trained observer, located in the therapy room, scored safety responses performed by the participant for 33% of the trials during the study. The two scores were compared for each trial, and an agreement occurred when both scores matched exactly. Point-by-point interobserver agreement was 100%.

Treatment Integrity

Fidelity data were also collected. This included the completion of all steps in the BST procedure and was collected by the first author and a second trained observer, located in the therapy room, for 60% of trials using a six-question checklist (see Appendix). Point-by-point interobserver agreement was 100%.

Procedure

IRPI Probes

Online-safety responses were assessed using IRPI probes conducted before and after BST sessions (see Table 1). During IRPI probes, the subject was unaware of the observation and was not informed of the assessment. During IRPI probes, two PC computers, with an internet connection, were concurrently logged into the online the gaming platform Origin. IRPI probes were conducted in the multiplayer environment of the game Plants vs Zombies: Battle for Neighborville. A second trainer was also present online in the multiplayer environment during IRPI probes to act as a confederate. Confederates were novel adults situated in a separate physical location from the first trainer and the participant.

At the beginning of the assessment the first trainer instructed the participant that it was “game time” (i.e., 30 min free access was provided to play an online video game). The video game used in the study (i.e., Plants vs Zombies: Battle for Neighborville) allowed for both in-game voice-chat and textual messaging between players. All communications made between the participant and the confederate during IRPI probes were made vocally using the microphone of the PC computer.

Next, the second trainer, acting as a confederate, contacted the participant within the video game (in-situ) after 5 min. The second trainer maintained the conversation for another 2.5 min (i.e., 7.5 min into “game time”) at which point the second trainer initiated an IRPI (e.g., What is your real name?). Participant-safety responses were scored according to the four-point rating scale detailed above. If the participant complied with the IRPI (i.e., provided the confederate the requested information) during the probe, the second trainer made an excuse (e.g., “Hey, I am sorry but I need to leave”) and the assessment was terminated immediately to avoid potentially reinforcing the future fulfillment of IRPIs. If the participant independently left the game before the IRPI occurred, the trial was scored as a failed trial.

Baseline

The participant received three IRPI probes during baseline and his responses were observed. No feedback was given to the participant regarding his performance.

Behavioral Skills Training

During BST, safety responses to IRPIs were taught to the participant using verbal instruction, modeling, rehearsal, praise, and corrective feedback. These responses consisted of abstaining from providing the requested information, saying “no” in response to the IRPI, stopping the game, and reporting the incident to an adult within 30 s.

BST sessions occurred only once per week and were concluded after 30 min or when a safety score of 4 was earned during roleplay assessments. BST sessions were conducted

until the performance criterion was reached. The performance criterion was a score of 4, without prompting, for two consecutive sessions on different days, similar to the criterion used by Bergstrom et al. (2014). During the first BST session five trials were conducted and the session was terminated after 30 min. The second BST training session also lasted 30 min and four trials were conducted. Finally, the last BST session was concluded following a single trial after the participant reached the performance criterion.

The training sessions started by briefly reviewing with the participant a Microsoft PowerPoint presentation. The presentations identified three different types of IRPIs, clarified to the participant that it is dangerous to provide personal information to strangers, and discussed appropriate safety responses to use with IRPIs presented online. Next, the participant was required to correctly state the safety responses to the first trainer before advancing to the modeling phase. The participant was prompted until he repeated all the safety responses correctly.

After the safety responses were stated, the training continued to the modeling phase. A second trainer, in a separate location, messaged the first trainer during gameplay, similar to IRPI probes. The first trainer modeled the correct safety responses to use with the IRPI. The online aliases (i.e., screen name) associated with the strangers during the modeling phase differed from those used by the confederate during IRPI probes.

Finally, the participant roleplayed the online safety responses during the rehearsal phase. The participant was told, “Hey let’s practice during game time”. IRPIs were made to the participant, with the trainer present, similar to IRPI probes. Verbal praise was provided for the successful completion of each step of the four-step response (i.e., abstaining from giving information, saying “no”, stopping game, and reporting to an adult within 30 s). If the participant received a score lower than 4, corrective feedback was provided for each missed step of the four-step response.

Posttest

Following the completion of the BST phase of the study, multiple IRPI probes were performed, the same as previously described during baseline.

In-situ Training

During the posttest assessment, in-situ training (IST) was included. During IST, the first trainer interrupted "game time" when the confederate presented an IRPI and the participant did not complete the four-step safety response sequence correctly. The first trainer provided the participant praise for safety responses that were performed correctly and corrective feedback for each missed step of the sequence, similar to the role play assessments conducted during BST.

Results

Figure 1 shows the participant's performance during baseline, BST, and posttest assessments. During baseline the highest safety score earned by the participant was a score of 1 (i.e., he abstained from providing personal information). Safety scores higher than 1 were earned by the participant abstaining from providing personal information and performing one or more of the other steps of the safety-response sequence. Each additional safety response the participant performed (e.g., saying "No", pausing game, or telling an adult) increased his safety-score rating by one point per additional response. In baseline, the participant provided his address during the third IRPI probe. The participant's safety scores increased during BST. On the 10th trial the participant reached the performance criterion.

The posttest results depicted in Figure 1, indicate the participant's performance did not maintain after BST. Across the initial three probes, the participant's performance was similar to baseline. On the fourth probe the participant earned a safety score of 2 (i.e., abstained from providing name and replied "no"). Similar to Johnson et al. (2005), IST was

then provided to the participant between the fourth and fifth probes. Immediately following the implementation of IST, the participant earned the maximum safety score of 4.

Discussion

Research consistently indicates that active learning strategies outperform informational strategies during safety-response training (e.g., Gatheridge et al., 2004). BST has also been demonstrated many times in the abduction prevention literature to be an effective method for training safety responses to lures presented in person (e.g., Gunby et al., 2010). Therefore, because BST was used successfully in previous abduction-prevention studies, we hypothesized BST would likewise be an effective methodology when employed to teach youth with ASD safety responses to lures encountered in a virtual context (i.e., while playing video games online). During BST, the participant's safety scores increased from those observed during baseline and the participant reached the performance criterion on the 10th trial. These results support this hypothesis and are consistent with the findings of past abduction-prevention research.

Although the participant reached the performance criterion during training, follow-up assessments revealed his responding did not maintain. These results are similar to other BST studies where some participants demonstrated skill acquisition during roleplay assessments, but their performance did not maintain during follow-up assessments until an IST component was included (e.g., Himle et al., 2004).

For example, Johnson et al. (2006) compared the effectiveness of combining BST with an IST component, to BST alone, when teaching preschool children abduction-prevention skills. The results of the study showed the BST with IST group earned higher safety scores during 2-week, 1-month, and 3-month follow-up assessments than the scores of the BST alone group. Based on the findings of Johnson et al. (2006), IST was provided to the participant after he did not perform the four-step safety response sequence correctly during

the fourth posttest probe of the posttest assessment. After the inclusion of IST, the participant successfully performed the four-step safety response sequence correctly. These results support combining BST with IST for participants whose responding does not maintain with BST alone.

However, in light of these results, there were limitations to this study. Most notably, experimental control was not sufficiently demonstrated because only one participant was recruited for the study. The experimental design that was proposed prior to the onset of this study was a multiple-baseline design evaluated across participants; however, recruitment for the study was hindered by COVID-19 precautions. For example, in order to reduce exposure, the first author was confined to interacting with a small number of children at the behavior-analytic practicum site where he was employed at the time of the study. Only one child met the inclusionary criteria for the study from the small group of children the first author was permitted to have contact with. Similarly, access to other clinics in the same corporate network were restricted also due to COVID-19 preventative measures. Thus, experimental control was not adequately demonstrated as BST was not evaluated across multiple participants. Yet, in lieu of this significant limitation, the present study provides preliminary evidence that safety behaviors for online interactions can be trained for youth with ASD using BST. However, questions remain regarding the persistence of the new learning. Future research should evaluate the effectiveness of implementing BST to train online-safety responses to youths with ASD with multiple subjects recruited for the study.

Another limitation of the study was the clinic where the study was conducted had a firewall which blocked online access to Plants vs Zombies: Battle for Neighborville. The first author connected the PC computer each session to a personal hotspot that was broadcast from his mobile device. As a result, the internet connection was poor during some trials and the voice chat did not function (i.e., the confederate was unable to make the IRPI). In response to

the absence of in-game communication during an affected trial, the researcher covertly called the confederate using another cellphone, enabled speakerphone, and placed the mobile device out of the participant's view prior to conducting the IRPI probe. Using the cellphone to simulate the voice-chat communications is another limitation of the study. It is unknown whether that participant's performance was influenced during trials that the mock threat was presented to the participant using the cellphone instead of using voice-chat.

Moreover, some assessment and training sessions were interrupted when the connection to the Origin server was lost. Reconnecting to the server resulted in lengthy delays (e.g., 5-10 min). In order to avoid delays associated with disconnecting and reconnecting to the Origin server, the third step in the safety response sequence was adjusted from "exiting" the game, to "pausing" the game at the onset of the study. These technical issues may have threatened the procedural integrity of the study. Future researchers should conduct IRPI probes and training sessions in a location with a strong internet connection and without a firewall that blocks access to video game websites.

The study was also limited because it was relatively labor intensive to implement. Two individuals were required to train the safety responses to one child. Future researchers should consider conducting the training in a group format with individualized probes to make the training more cost effective.

In addition, only the participant's responses to the presentation of the mock threat were assessed during the study. Future research may consider evaluating participant's responses both to nonthreat conversation overtures, as well as responses to the mock threat.

Lastly, the study was limited because the researchers were unable to prevent unknown individuals from interacting with the participant during assessments and training. The video game Plants vs Zombies: Battle for Neighborville was selected for this study because it is a multiplayer-online video game that was age-appropriate, allowed for voice chat and in-game

messaging, and the participant expressed his preference for the game prior to the study. In the multiplayer environment of Plants vs Zombies: Battle for Neighborville, when the voice-chat function is enabled, all vocal communication from players in the multiplayer environment who also have voice chat enabled are audibly broadcasted through the computer's speakers. Textual communication between players is also displayed on the computer screen. The game settings only allow for a maximum of four players to be muted at one time. Therefore, players extraneous to the study were able to contact the participant during trials. Following an occurrence of extraneous-player communication, the first author interrupted the participant's gameplay and muted the extraneous player. Subsequently, some trials were interrupted when this occurred. There were also trials when more than four players had their voice chat enabled and some communication with the participant could not be controlled (i.e., muted) by the first trainer.

For instance, during numerous trials there was one specific player (unknown to the participant or experimenter) that frequently contacted the participant using voice chat. In addition, he sent the participant invitations to join his private group throughout IRPI probes and training. Following these engagements, the game was paused, the player was muted, and any invitation to private games were also declined. Future research should select games to use in the study that give the experimenters better control over which communications are broadcast to participants. Although it was a limitation, it should be noted that communication among unknown players was the rule and not the exception during this study which highlights the need for this specific type of safety training.

In light of these limitations, the present study extends the BST literature because it is the first study to teach safety responses for threats encountered while playing online video games. This is an important line of research because video games are massively popular and frequently played by youth with ASD. These games can present a serious risk to this

vulnerable population because they provide access to the internet and youth with ASD, due to the social deficits associated with the disorder, are typically more susceptible to dangers (e.g., solicitations from internet predators) that could be encountered online.

Finally, this study also broadens the BST research because it represents the first attempt to utilize BST to address online safety. There are numerous safety threats that reach beyond the scope of this study (e.g., cyberbullying, digital literacy, sextortion). Technology with access to the internet (e.g., smartphones) is ubiquitous in modern society, especially with teens. Thus, online safety certainly warrants attention from the field of behavior analysis. The results of this study support future research to evaluate the efficacy of BST to teach online-safety skills for a host of malevolent threats present on the internet.

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Table 1

IRPI Probes Types Used During Baseline, BST and Posttest Conditions

Trial	Condition	IRPI	Safety Score
1	Baseline	Name	1
2	Baseline	Location	1
3	Baseline	Address	0
4	BST	Name	1
5	BST	Address	0
6*	BST	Name	2
7	BST	Name	1
8	BST	Name	1
9*	BST	Name	1
10*	BST	Address	1
11*	BST	Name	3
12*	BST	Name	4
13	BST	Name	4
14	Posttest	Name	1
15	Posttest	Location	1
16	Posttest	Address	0
17	Posttest	Address	2
18	Posttest	Address	4

Asterisks indicate the trials when IRPIs were made using a cell phone

Figure 1

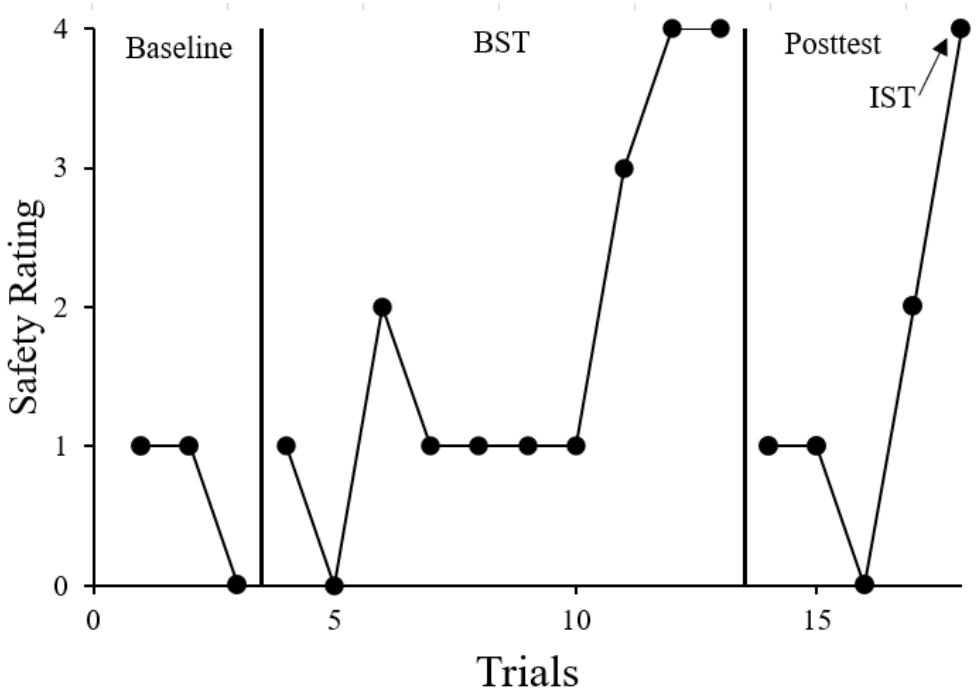

Figure 1. Safety scores earned by the participant across baseline, BST, and post-training conditions.

Appendix

Treatment Integrity Checklist

BST

1. Were different types of IRPIs discussed _____(y/n)?
2. Were appropriate safety responses to use with IRPIs explained _____(y/n)?
3. Did the participant correctly state safety responses _____(y/n)?
4. Did the trainer model safety responses with IRPI simulation _____(y/n)?
5. Did the participant roleplay the correct safety responses _____(y/n)?
6. Was praise and corrective feedback provided _____(y/n)?

Score 1 point for each question answered yes.

Total score: _____