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Social Story TM and In-Situ Training at Home: Effects on Household Chemical Safety Skills in Young Children

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Social Story™ and In-Situ Training at Home: Effects on Household Chemical Safety Skills in Young Children

by

Courtney Ek

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

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DEDICATION

My time spent these last two years, conducting this research and pursuing my Master’s Degree is dedicated to my family and friends. I could not have made it this far without my husband, parents, pastor, sisters, cousin, niece, or nephews. They have continuously encouraged me to keep on pursing this dream of mine from the beginning. I cannot imagine this journey without my amazing and unfailing support system. You are all so appreciated. I am beyond thankful for each and every one of you.
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ABSTRACT

The purpose of this study was to expand the literature on Social Story™ and in-situ training by targeting household chemical safety skills in typically developing young children. The study involved three children, ages 2 and 3 years old who had difficulty performing household chemical safety skills at home. A multiple-baseline across participants design with an ABC sequence was used to examine the effects of the Social Story™ and in-situ training interventions on the children’s household chemical safety skills. The investigation focused on examining whether the Social Story™ alone would be effective in teaching targeted safety skills to children or whether adding in-situ training would be necessary to enhance the treatment outcomes. The results indicated that Social Story™ with in-situ training was more effective than Social Story™ alone in teaching household chemical safety skills to children, ages 2 and 3 years old.
CHAPTER ONE:
INTRODUCTION

Approximately two million poisonings were reported in 2014; of the two million poisonings, 48% were children six years old or younger (Mowry, Spyker, Brooks, McMilan, & Schauben, 2015). According to the Center for Disease Control and Prevention (2014), more than 90% of poisoning incidents occur at home, and many of these incidents occur from exposure to household chemicals that include cleaners, cosmetics, personal care products, pain medications, pesticides, lead-based paint, and laundry detergents. Ingesting or contacting these chemicals may cause chemical burns, blindness, or death (Safe Kids Worldwide, 2013).

In an attempt to reduce poisonings from household chemicals, national programs have been created to teach parents and children about the dangers of these chemicals and provide parents tips to prevent poisonings. The Centers for Disease Control and Prevention (2012) recommends that parents lock medications, keep them in their original packaging and out of sight of the children, know the number of the local poison control center, follow all label medication instructions, and discard any medications that are no longer needed. However, little is known about the extent to which this informational approach has helped reduce accidental poisonings. Furthermore, these recommendations do not directly teach children the skills to reduce ingestion or contact with hazardous chemicals found in their homes.

Wynn et al. (2015) analyzed interventions that taught parents poison prevention behavior in households with children. The authors evaluated 13 systematic reviews, two meta-analyses, and 47 primary studies, and found that the interventions focused on increasing safe storage of
medication bottles and household products, the use of child-resistant containers, possession and use of Ipecac (used to induce vomiting of poisons), and the use of poison control center stickers and telephone numbers. In the second meta-analysis, Achana et al. (2015) evaluated the effectiveness of these interventions in teaching parents to increase safe storage of medicines, household products, and poisonous plants as well as to have their poison control center phone number. The authors found that many of these interventions were effective in teaching poison prevention behavior to parents. However, the interventions mainly focused on teaching parents to prevent poisonings and how to respond if their child was poisoned. Furthermore, as Forjuoh (2016) pointed out, there is not enough evidence to demonstrate that these interventions have substantially reduced the occurrence of child poisoning.

An alternative approach that may help reduce poisoning from hazardous household chemicals is to teach children poison safety skills. Although it is important to create laws that regulate packaging and teach parents to prevent poisonings and respond appropriately to these incidents, there will be instances when children encounter hazardous household chemicals, and children should know what to do in these circumstances. First of all, children should learn how to recognize hazardous household chemicals and how to take steps to avoid becoming poisoned such as asking parents for permission to eat or drink unknown items (Liller, Craig, Crane, & McDermott, 1998).

Liller et al. (1998) examined the delivery of a 40-min poison prevention lesson using a community health education curriculum with over 370 kindergarten and third grade children. The results showed that compared to the control group, the children who received the training responded to more questions correctly. Parents also stated that their homes were safe from poisons. Although the training involved didactic instruction and role-plays for kindergarten
children, the children had few opportunities to practice household poison safety skills during training and it was not known whether the children’s poison safety skills performance increased as a result of the intervention.

Dancho, Thompson, and Rhodes (2008) taught 15 typically developing children (ages 3 to 5 years) in small groups of three to four children to “always ask a grown up before eating, drinking, or tasting anything” and “to wait for an adult if one is not available.” These skills were taught using an active learning approach during a group safety training that used behavior skills training (BST) involving instruction, modeling, rehearsal, and feedback (Miltenberger, 2008). In-situ assessment and response interruption were used with three participants who failed to demonstrate the appropriate behaviors after the initial training. The results were consistent with studies that found group behavior skills training had limited effects, and in-situ assessment and training were critical in teaching safety skills to children.

In-situ assessment occurs during in-situ training (IST) that involves arranging a situation in the natural environment to assess whether a child can demonstrate the skills in the context in which they should be implemented. If the child does not demonstrate the skills, the trainer interrupts the assessment and trains the skill in the moment (Miltenberger, Gross, Knudson, Jostad, & Breitwieser, 2009). Dancho et al. (2008) suggested that in-situ assessment and training are critical components of poison safety skills training. Miltenberger (2008) also suggested that in-situ assessment is necessary to evaluate a child’s use of safety skills, and IST is the most consistent teaching method when it comes to generalizing the use of safety skills across settings.

Summers et al. (2011) used a simple behavioral skills training package (rules, least-to-most prompting, and contingent social praise) to teach six children with autism how to respond safely to household cleaning chemicals in addition to safety skills related to the doorbell. During
training the children were taught a rule of what to do when they encountered a chemical or if the doorbell rang, given immediate praise if completed the skill successfully, and given a two-step least-to-most prompt (verbal prompt and physical guidance) until the children successfully completed the task across three sessions. The results showed that all participants successfully learned the necessary safety skills. However, as discussed above, to date, only a handful of studies have attempted to address the household poison safety skills using direct teaching approaches and, to our knowledge, only Summers et al. taught children household poison safety skills when they are at home, and no studies involved parents in training children to use the household poison safety skills.

BST and IST incorporate active learning approaches that involve directly teaching safety skills to learners by explaining the skills and then having them practice the skills as if they were in a real life situation using role play sessions (Himle, Mintenberger, Gatheridge, & Flessner, 2001). An advantage of using an active learning approach is that it allows the trainer to evaluate the learner’s utilization of the skills being taught and provides the trainer an opportunity to correct the learner if necessary (Miltenberger, 2008). The literature indicates that in teaching new skills active learning approaches are more effective than passive learning approaches that are limited to simply providing learners with information about potential safety threats and skills they should use (Gatheridge et al., 2004; Himle, Miltenberger, Gatheridge et al., 2004). Several studies have shown that if children are given opportunities to practice safety skills and are given feedback on their performance, they will have more success in learning the targeted safety skills (Beck & Miltenberger, 2009; Gatheridge et al., 2004; Himle, Miltenberger, Gatheridge, 2004; Poche et al., 1988).
Another viable option for parents to teach their child household poison safety skills may be Social Story™ (SS), which is relatively simple and efficient to implement (Smith, 2001). Although SS may be considered as using a passive learning approach compared to BST and IST, it is written in a specific format to teach specific social situations by increasing the awareness of expected social cues and behaviors (Smith, 2001), and follows guidelines set by Gray and Garand (1993). It is typically short with between 20-100 words and contains visual aids.

According to the guidelines, seven sentence types could be used in a story to teach target skills: (a) descriptive; (b) directive; (c) perspective; (d) affirmative; (e) cooperative; (f) control, and (g) partial. It is also recommended that the story be written using a specific ratio of sentence types such as two to five descriptive, perspective, cooperative, and affirmative sentences for every control or directive sentence (Reynhout & Carter, 2006).

The literature indicates SS is effective for teaching a variety of skills, such as self-help skills, complying with rules, and social interaction skills when used with a range of populations such as children with autism (Barry & Burlew, 2004; Crozier & Tincani, 2005; Mancil, et al., 2009; Mayton, Menendez, Wheeler, Carter, & Chitiyo, 2013), intellectual disabilities (Kim, Blair, & Lim, 2014), and typically developing children (Benish & Bramlett, 2011). Additionally, they have been successful in different settings such as home (Kuoch & Mirenda, 2003; Lorimer, Simpson, Smith Myles, & Ganz, 2002), school (Benish & Bramlett, 2011; Dancho, Thompson, & Rhoades, 2008; Mancil, Haydon, & Whitby, 2009), and community (Gardner, & Griffiths, 2004). A few studies have also shown the SS intervention was effective in promoting generalization of acquired skills across settings for children with autism (Delano & Snell, 2006; Sansosti, Powell-Smith, & Kincaid, 2004). It has been suggested that the children who have basic language skills benefit from the SS intervention (Gray & Garand, 1993).
The SS has been successful when used alone for teaching new behaviors (Lorimer, Simpson, Smith Myles, & Ganz, 2002). However, they have also been used with other behavioral components and as part of a treatment package, and little information is available whether SS itself is an evidence-based intervention (Sansosti et al., 2004; Reynhout & Carter, 2006). For example, Crozier and Tincani (2005) showed that the SS intervention was effective in decreasing disruptive behavior in a child with autism when used in conjunction with verbal prompts. Researchers have also incorporated response cost (Swaggart et al., 1995), role play (Chan & O'Reilly, 2008), and reinforcement (Iskander & Rosales, 2013) into SS.

Despite the positive outcomes of using SS for teaching a variety of skills in children with and without disabilities, the literature has not reported on the use of SS to teach hazardous household chemical safety skills to children. In addition, it is not known whether adding IST to SS will lead to better outcomes than when using SS alone for teaching the household chemical safety skills. Taking the limitations of previous research on SS and IST into account, this study attempted to expand the literature base by examining the effects of SS and SS combined with IST on hazardous household chemical safety skills of typically developing children, ages 2 and 3 years old. Specifically, the study examined (a) the extent to which SS was effective in teaching household chemical safety skills to typically developing young children, and (b) the extent to which SS combined with IST improved performance of the safety skills when SS alone led to limited acquisition of the safety skills.
CHAPTER TWO:

METHODS

Participants and Setting

Participants. The current study evaluated the use of SS and SS with IST to teach hazardous household chemical safety skills to children, ages 2 and 3 years old. Three children and their parents were recruited to participate in this study. All participating children: (a) were typically-developing without a disability diagnosis; (b) enjoyed books or listening to stories, per parent report; (c) had a passing score on the communication domain of Battelle Developmental Inventory, 2nd Edition, Screening Test (BDI-2 ST; Newborg, 2005); and (d) had difficulty performing household chemical safety skills. Children who engaged in problem behavior that may disrupt the study procedures or who had previous training on poison safety skills were excluded from the study. All parents had no previous training on implementing SS and IST, or on teaching children hazardous safety skills.

The researcher attempted to recruit participants through flyers that were posted on announcement boards at a local daycare. The flyer included a brief description of the study, the researcher’s contact information, and the participant’s eligibility requirements. The flyer instructed parents to contact the researcher via email or phone. However, no participants were recruited through the flyers. The participants in this study were recruited through self-referrals or in-person referrals that included word-of-mouth and snowballing from friends or acquaintances, and referrals from other potential participants. An initial informal interview was conducted when a potential participant contacted the researcher to ask questions to determine the parent and
child’s eligibility to participate in the study (Appendix A). Once potential participant was deemed eligible, the researcher reviewed the consent form with the parent. During the review of the consent form with the families, the researcher described the study and answered parents’ questions or concerns. During the initial interview and before asking the parents to sign the consent forms, the researcher told the parents that they did not have to sign the consent form. They were given a week to discuss the study with their partner and respond regarding their participation. The parents were informed that they had the right to drop out of the study at any time. Three participants and two parents were recruited for this study.

DM. DM was a 2-year 8 month-old Caucasian male child. He did not attend day care, or an early education program, and was under the primary care of either parent or his grandmother at all times. DM had no previous chemical safety training. DM had an older sister who he interacted with frequently. Per parent interview, and observations made by the researcher, DM enjoyed educational television shows, reading books, playing outside, playing with toys such as his scooter, drawing, painting, and playing with his sister. DM’s mother reached out to the researcher to ask if DM could participate in the study after DM contacted hazardous household chemicals and mediations several times in their home. DM’s mother was concerned for DM’s safety, and was interested in participating in the study when she heard about it from her co-workers who had potentially seen the flyers posted in the local day care. DM’s mother was working at a pharmacy as a pharmacist.

SF. SF was a 3-year 10 month-old Caucasian male child. He also did not attend day care, or an early education program. He was under the primary care of both parents, and frequently babysat by his grandmother. SF had no previous chemical safety training. He had one younger sister. SF enjoyed playing outside, watching videos on YouTube, playing video games, reading
books, playing with toys such as Mario or Pokémon characters. SF had previously contacted hazardous chemicals in their home, and SF’s mother believed this study could help protect her child in the future. His mother was working at the same pharmacy as DM’s mother as a technician.

**ZF.** ZF was a 2-year 3 month-old Caucasian female child. As with other participants, she did not attend day care or an early education program. She was SF’s younger sister. She was under the primary care of both parents, and was frequently babysat by her grandmother. ZF had no previous chemical safety training. Her mother was expecting her third child during the time of the study. ZF enjoyed playing dress up, reading stories, playing with toys such as stuffed animals or baby dolls, playing outside, and watching videos on YouTube. ZF’s mother asked if ZF could participate in the study at the same time as she asked if her older son, SF, could participate. ZF had previously and frequently contacted hazardous chemicals in their home. ZF’s mother believed that if ZF would participate in the study, she could significantly benefit and increase the safety of both children in their home.

**Screening.** Once the parents signed the consent form, a screening was conducted to confirm the child’s current developmental level in communication and parental concern with the household chemical safety skills. Prior to the screening, the researcher conducted a brief (5-10 min) interview with parents to identify one or more locations (e.g., kitchen, bathroom, laundry room, living room, kid’s bedroom) in the child’s home where the household chemical was stored or present, and where the child was reported to have shown unsafe behavior touching a household chemical. The researcher visited the family’s home to conduct the screening during a time that was convenient to the parents.
To screen the child’s developmental level in communication, the researcher used BDI-2 ST, a standardized, developmental screening instrument designed to identify children at risk for developmental delay, ages 5 months through 8 years and proven to be valid and reliable (Newborg, 2005). The communication domain of the instrument screened expressive and receptive verbal or non-verbal communication skills and consisted of 20 items with a few items relevant to children 2-years to 3-years and 11 months old. The communication domain was administered in less than 5 min by interviewing the parent about their child’s development. Scaled scores were compared with cutoff scores (1.5 standard deviation below mean) to determine the child’s possible developmental delays. All participating children passed the screening test indicating that they were functioning at an age-appropriate level in communication development compared to their typical peers.

To screen the child’s household chemical safety skills, the researcher or parent used a container, devoid of any hazardous household chemicals and pretended to clean something (Summers et al., 2011). The researcher or parent left the container within the child’s reach and left the area. If the child approached or touched the chemical container, or did not touch the container but did not leave the area, the child was included in the study. This screening assessment took less than 10 min. All three participants either touched the chemical or did not leave the area.

**Setting.** The study took place in the participant’s home where hazardous household chemicals were typically placed or found and that were identified as potential target settings during screening. Rooms that the participants spent much of their time playing were also included to assess if the child would spot the chemical and notify an adult in those settings. The
rooms included bathroom, kitchen, participant’s bedroom, living room, playroom, outside by participant’s play area, and garage.

**Materials**

**Hazardous household chemical containers.** The following hazardous household chemical containers were used during the study: Fabuloso, Cascade Complete All in 1 Packs, Lysol Complete Clean toilet bowl cleaner, Comet Scratch Free Disinfectant with Bleach, and Gain fabric softener dryer sheets. To ensure the child’s safety and prevent the child from coming in contact with the hazardous chemicals, the researcher emptied all of the liquid chemicals from the bottles, sanitized them using soap and water, and filled them up with water with food coloring that resemble the original cleaning chemicals. The researcher used super-glue on the caps to the bottles to ensure that they cannot be easily opened. Additionally, the researcher replaced the softener dryer sheets with tissues and Duct-Taped over the box of sheets. The box of All in 1 Packs was replaced with little zip lock pill bags filled with water with food coloring, and the container was sealed with gorilla glue. The researcher kept the chemical containers, and brought them to each session. A checklist was used to ensure that all safety measures were conducted with each participant prior to beginning of each session (see Appendix B).

**Social Story™ and iPad.** The SS was written to describe the target safety skills. Each story included 12 slides that contained pictures individualized for the participants; however, ZF and DM used the same story. The stories contained cartoon pictures characters, and cartoon chemical containers. Each slide contained 1-2 sentences along with pictures that illustrate each safety step: (a) do not touch the chemical container, (b) leave the area, and (c) tell an adult (mom) about the presence of the container. For example, a picture of a child with his arms
crossed and a scared expression on his face, when a household chemical is close, was placed on the page with a typed sentence describing the target skill (e.g., “If I see a chemical, the first thing I should do is not touch it”). The story contained a ratio of 2-5 affirmative, descriptive, and/or perspective sentences for every partial or directive sentence, along with character visuals. The types of sentences are defined as the following; (a) affirmative- emphasizes the meaning of sentences, (b) descriptive- answers the ‘wh’ questions, and present the material in an precise perspective, (c) perspective- refers to thoughts, feelings, ideas, opinions, or well-being of others, (d) partial- incomplete sentences to give the reader the opportunity to guess at what is next, and (e) directive- a positively worded sentence (“I will try…”) that offers a response for a situation (Gray & Garand,1993). A story that was used is presented in Appendix C. The SS was presented in a PowerPoint format on an iPad using the Able2Extract application. The Able2Extract application allowed PowerPoint slides to be shown on an iPad, and allowed the parent or child to scroll through the story or enlarge a picture during the session. An iPad Mini was provided to both parents by the researcher for each session.

Measurement

Household chemical safety skills. The dependent measure was the rating scores of the household chemical safety skills performance in responding to the presence of chemicals during in-situ assessment. The children’s responses were rated on a 4-point scale according to the following four behaviors, in ascending order of safety (Summers et al., 2011): (0) touched the chemical containers regardless of any subsequent responses; (1) did not touch the chemical containers, but did not leave the room or area in 30 s or less; (2) did not touch the chemical containers, but exited the area within the allowed 30 s but within approximately 5 ft or more of
the chemical container and did not tell an adult about the presence of the chemical, or did not touch the chemical container, but stayed in the room or area (approximately 5 ft or more), and attempted to get the parents attention about the presence of the chemical; and (3) did not touch the chemical containers, left the area within approximately 5 ft or more of the chemical, and informed the parents about the chemical. Because of the child’s age, and the fact that the child could not be left out of the parents’ sight, modifications were made to the rating scale. In-situ assessments were conducted with the parent in the same room. The scoring was also determined if the child initiated notifying the parent about the chemical. Different topographies for getting the parents attention regarding the chemical included running away from chemical towards parent, grimacing, screaming, grunting, or sticking out tongue while going towards parent, pointing to the chemical or in the direction of the chemical while backing up, walking or running away, acting scared as depicted in the SS, babbling, stuttering, or attempting to say chemical. Prompts were accepted from parents such as: “What’s wrong?” “What is it?” “What do you see?”, “Oh no!”, and “What should you do?”. Prompts such as “Now run away,” or “You saw the chemical, you didn’t touch it, now run away, and tell me” were not accepted. Times of day, illnesses, missing naps, and moods were considered when scoring the participants responses (e.g., If the child was uncooperative because of illness or missing a nap, the researcher would allow more than 30 s to get away from the chemical; if it was close to the child’s meal or nap time, the child required the adult to give a verbal prompt upon seeing the chemical, or verbal instructions to enter the area where the chemical was present, thus indicating that more time was accepted for the child to notice the chemical, and leave the area). Also, if the skill of telling mom was in the child’s repertoire, but the child pointed or needed an acceptable prompt, it was counted.
A pen or pencil and a data sheet (see Appendix D) were used to score the targeted behavior for each session. The participating children’s household chemical safety skills were measured during in-situ assessments using similar procedures to those used during screening. In the in-situ assessment procedures, the parent briefly pretended to clean an area in one of the rooms where the study took place, left a hazardous chemical container in sight of the child, or placed a chemical near an item the participant had previously shown interest in, and then left the area. In some sessions the researcher placed a chemical near an item the participant previously showed interest prior to reading the SS while the parent read the SS to the participant. The observers (researcher and a research assistant) scored the child’s response by watching or using a smartphone camera, hiding out of sight from child to minimize stimulus control effects. Approximately 32% of the sessions were video-recorded to collect inter-observer agreement data.

**Treatment fidelity.** Treatment fidelity assessments were conducted on the parents’ implementation of the SS and IST procedures for 25% of intervention sessions. A task analysis was used to assess whether the parents implemented all of the steps correctly (see Appendix E). The SS treatment fidelity checklist included items: (a) prompt the child to sit with them to start the story; (b) read the story to the child; (c) ask three to five comprehension questions; (d) provide verbal feedback for responses; and (e) provide the child with an opportunity to utilize the skills learned from the story within 20 min after reading it. The IST fidelity checklist included: (a) instruct child to perform the safety skills (i.e., do not touch the chemical container, leave the area within 30 s, and tell an adult about the presence of the container); (b) have the child practice the skills until being able to perform the skills three times; and (c) provide positive or corrective feedback for correct or incorrect performance. Treatment fidelity was calculated as a percentage
of steps completed correctly by dividing the total number of correct steps by the total number of steps listed on the task analysis and multiplying the score by 100. Treatment fidelity average for each participant was 95% for DM, 100% for SF, and 95% for ZF. For DM and ZF, the fidelity was 100% in all assessed sessions except one session, which was 66%.

**Social validity.** Social validity was assessed using a questionnaire (Appendix F) adapted from Johnston et al. (2005) to determine the parents’ perception on effectiveness, acceptability, and satisfaction with each of SS and IST procedures. The questionnaire was rated on a 5-point Likert-type scale and consisted of five questions regarding how easy the procedure was to implement, the likelihood that the parent would implement the procedures with other children, and the relevance of the hazardous safety skills. The questionnaire was given to the parents along with a pre-filled envelope and stamp. Parents were instructed to fill out the questionnaire, write notes under the survey if they felt necessary, and mail it in the envelope provided. This ensured that the parents did not feel obligated to give a specific response and allowed the parents to submit the survey anonymously.

**Inter-observer agreement.** A second observer independently scored the participant’s performance of the safety skills to assess inter-observer agreement (IOA) across participants and experimental phases. IOA was calculated by dividing the number of agreements on the four target responses by the number of agreements plus disagreements then multiplying by 100. (Appendix G). The research assistant was a graduate student in an Applied Behavior Analysis Master’s Program. The researcher trained the research assistant on measuring the household chemical safety skills by providing instructions on how to fill out the datasheets, discussed scenarios, acceptable prompts, as well as acceptable topographies for attaining the participant’s parent attention. The researcher also instructed the research assistant on the data collection
process, and provided feedback. The research assistant was trained using a data sheet that contained the participant earning a score of a 3 (the child did not touch the chemical container, left the room, and told an adult or got the adult’s attention in some way about the chemical with or without prompts). IOA was assessed 20% of baseline sessions for SF, 25% of SS sessions for DM, and 44%, 60%, and 83% of the SS + IST sessions for DM, SF, ZF, respectively. IOA was 100% in all assessed sessions across participants and phases with the exception of one session of SS and IST session for DM, which was 67%.

**Experimental Design and Procedures**

The study was conducted using a multiple baseline across participants design with an ABC sequence to examine the impact of SS and SS with IST on children’s household chemical safety skills. The following three phases were conducted: baseline, SS, and SS with IST.

**Baseline.** The baseline session began by the parent or primary researcher pretending to clean something in the room where the child was, then placing the chemical container in the child’s sight and leaving the area, or simply placing the chemical container in an area in which the child was present. The parent and researcher monitored the child to see if he or she touched the chemical. The researcher either observed the child from a different room or would be present and talk to the parent while the parent pretended to clean in the same area or within 15 ft or less of the child, paying little to no attention to the child. The parents or researcher did not deliver any consequences or feedback contingent on any response of the child. The parent or researcher removed the chemical after the child was assessed. However, the parent did provide praise if the child did not touch the chemical. Across participants, the assessment was conducted in two or three rooms (e.g., living room, kitchen, bathroom, or child’s room) with at least one room being
a place in which the child spent much time playing. The assessment sessions were attempted to be counterbalanced across settings (rooms). Additionally, the assessments were conducted with a variety of chemicals. Baseline sessions were no longer than 10 min and were conducted until stable patterns were observed in the data.

**Parent training.** Modified BST procedures were used to train parents to implement SS and IST procedures. During training, the researcher reviewed the intervention implementation procedures with the parents using the instruction sheet, modeling the procedures or giving scenarios of what the sessions may look like, and providing parents with the opportunities to ask questions. Additionally, the researcher provided scripts to parents to be used while conducting SS and IST sessions and instructions on what to do or say if the child touched the chemical (Appendix H). The researcher and the parents briefly discussed the procedures, and the researcher provided feedback on the parent’s performance. Unlike standard BST procedures, no formal rehearsal was conducted. Parents were often instructed throughout the study of when to begin the SS reading, how the assessment would take place, and how to get the participant to engage in the assessment (i.e., “Thanks for reading, you can go play with your scooter again).

**Social Story™ (SS).** The parents implemented the SS intervention with their children at home, in an area where the child had been observed touching the chemicals, or where it was likely that the child would find the chemicals. The SS intervention procedures included the parent telling the child to sit with them to start the story on iPad, reading the story to their child in a room usually chosen by the parent or researcher, asking three to five comprehensive if, who, what, when, and why questions (e.g., “If you see a chemical you should...?”), and providing verbal feedback for responses (e.g., “Good job! That’s right you should run away”). If the child answered the question correctly the parent provided verbal praise for the response, and if the
child answered the question incorrectly, the parent either referred back to the story and provided corrective feedback (e.g., “remember in the story the boy ran away when he saw the chemical”), or informed the child of the correct step to take if a hazardous chemical was present (e.g., “No, you don’t touch it, run away, and come get me”). The intervention was delivered during approximately 5 to 10 min sessions. Approximately 3 to 20 min after reading the story (depending on parent or child’s routine schedule), the parent provided the child with an opportunity to utilize the skills taught in the SS (e.g., the parent will say, “ok, go play”) during which the researcher assessed the child’s use of the safety skills. The area or room where the child was sent to play contained a chemical container that was within the child’s reach and eyesight. If the child did not perform the safety skills during the assessment at a rating of 3 for four consecutive sessions, IST was implemented in conjunction with SS. Only one session occurred per day for any participant.

**SS with IST.** During this phase, immediately following the SS reading, the child was provided an opportunity to contact a hazardous household chemical. An in-situ assessment was conducted in the same fashion as in baseline and SS phases to determine whether the child engaged in the safety skills (i.e., do not touch the chemical container, leave the area within 30 s, and tell an adult about the presence of the container in some way) when the simulated safety threat was presented at home. The child was asked to go to a room in the home where chemicals were present to play or grab an item that was near a chemical, approximately 5 ft or more away from parent. A hazardous chemical was placed in the child’s sight. The researcher was out of the child’s sight to observe the child and score the child’s performance. If the child scored a 3, the parent or researcher immediately provided positive feedback on the child’s performance (e.g., “Great job! I really liked how you did not touch the chemical, left the room, and came to tell me
[parent]!”), and reinforced further with additional attention (e.g., saying “I’m proud of you”, or giving hugs/kisses). The child was then allowed to engage in the preferred activity he or she was engaging in prior to the SS. The assessment ended at this time. If the child earned 0-2 points, the parent or researcher said, “this is a chemical, is not safe to touch, it can make you sick. When you see this, do not touch it, leave right away, and tell an adult.”, and immediately began IST. In one or two sessions, per participant, tangibles (e.g., lollipops, cookies, popsicles, access to games on iPad Mini) were given prior to reading the story, while reading the story, or after the in-situ assessment took place regardless of the child’s score when the children had difficulty engaging in the story reading activity or in-situ assessment because of fatigue, illness, or other environmental events. Due to health conditions with both participants’ parents (i.e., one parent was toward the end of her pregnancy, experiencing minor complications, as well as fatigue, swelling, a constant abdominal pain or uncomfortable feeling, and the other parent started experiencing abnormal pain, headaches, and inflammation which lead to testing, and an unofficial diagnosis of Lupus) the researcher practiced the skills with the children in the majority of the sessions during this phase, but always had the children tell their mother.

During this phase, the parent and researcher talked with the child about the skills to be performed and asked the child to practice the skills until the child demonstrated all three skills correctly in a role-play-like scenario. For example, the parent or researcher said, “If I see a chemical, I will not touch it, I will get away from it, and I will tell an adult”, then demonstrated the skills (1. do not touch the chemical, 2. leave the area, and 3. tell an adult), and then asked the child to perform the skills. During a few sessions, the researcher and parent role-played the correct safety skills. Once the child correctly demonstrated the skills, the session ended. All three participants needed verbal prompts given by the parent during assessment (i.e., when the child
left the area, the parent would say, “what is it?”). Prompts such as “now come tell me” were not accepted.
CHAPTER THREE:

RESULTS

The results are depicted in Figure 1 for all participants across phases. As shown in the figure, SS was moderately successful in teaching the children safety skills. All three participating children proceeded to the subsequent SS plus IST phase due to limited improvement in the SS phase. With the addition of the IST, they demonstrated further improvement.

In baseline, all three children either touched the chemical or did not leave the area, earning a score of 0 or 1. Once the SS phase was implemented, SF and ZF showed an immediate increase in use of safety skills. During this phase, SF did not touch the chemical and left the area, but failed to tell his parent, scoring a 2 in all sessions. ZF did not touch the chemical, but stayed in the area in all sessions, scoring a 1 or a 2. For DM, after the first SS session, DM’s score increased from 0 to a 2; he did not touch the chemical and left the area. Across participants, data were stable in the SS phase. During the SS phase, none of the children told their parents about the chemical. Thus, indicating the IST phase was necessary for all three participants.

In the SS plus IST phase, SF’s skills improved after one session. He required the use of prompts to tell an adult in most sessions, when he was not willing to participate in the in-situ assessment or IST due to environmental factors such as missing a nap, times of day, and having to leave a preferred activity. Acceptable prompts for SF included “What should you do?”, “What’s wrong?”, and “What is it?”. DM improved after two sessions. He also required prompting to tell an adult in most sessions due to the uncontrolled environmental events. Acceptable prompts for DM were similar to SF’s prompts.
During the second phase, ZF showed immediate improvement scoring a 2 or 3 in the first three sessions. However, in five of the next eight sessions she touched the chemical, whereas in three of the sessions she scored a 2 (did not touch and exited the area). Practicing the skills during IST appeared to become aversive for ZF. Problem behavior would occur when ZF did not engage in the necessary safety skills. ZF would often not practice the skills independently. Tangible reinforcement was attempted to increase compliance with practicing; however, it became a distraction. ZF still did not engage in practicing the skills. She attempted to look for the tangible reinforcement in the primary researcher’s belongings during sessions 23 and 24. In the last two sessions, the primary researcher did not bring the tangible reinforcement box, or a bag in. This seemed to lessen the distraction for ZF. However, ZF still did not engage in all three safety skills. She needed prompting to tell the parent about the chemical.

The results of the social validity surveys indicated that both families strongly agreed that the interventions, both the SS and SS plus IST were easy to implement, and had a positive experience. Two of the three participants’ parents agreed that the interventions were effective in teaching the child hazardous chemical safety skills, believed that the treatment decreased the likelihood that the child would ingest hazardous chemicals, and that the parent would use the treatment again. One participant’s parent strongly agreed that the interventions were effective in teaching the child hazardous chemical safety skills, believed that the interventions decreased the likelihood that the child would ingest hazardous chemicals, and that the parent would use them again. One parent also commented that the other child in the household had also benefitted, and made the intervention fun. The parent stated that both the participating child and the sibling now inform the parent of a chemical whenever there was one present. The parent also reported that all adults in the house who frequently cared for the children became more careful to keep the
hazardous chemicals, or other potential hazardous items out of the children’s reach, but were less worried that the child would ingest a chemical than prior to starting the intervention.
Figure 1. Rating scores of household chemical safety skills across participants and phases
CHAPTER FOUR: DISCUSSION

This study attempted to extend the literature on SS and IST by teaching household chemical safety skills to typically developing young children. The focus was examining the relative contributions of SS and IST on improving the safety skills. Specifically, performance in the chemical safety skills was measured under two conditions, SS and SS plus IST in which a new intervention component, IST was added to the SS intervention that was previously in effect to examine whether use of SS in conjunction with IST would enhance the treatment outcomes. Three typically developing children, ages 2 and 3 years old participated in the study, and the parents of the children implemented the interventions at home in collaboration with the researcher. The results of the study indicate that the use of the SS increased all participating children’s household chemical safety skills; however, the SS alone was not sufficient in teaching the children the targeted skills. Both the SS and IST were needed for all participants to successfully perform the necessary safety skills targeted in this study.

The study demonstrated that household chemical safety skills could be better taught to typically developing children ages 2 and 3 years old when SS was used in a treatment package in conjunction with IST. The results support the findings of previous studies in that when SS are used in conjunction with another treatment component, the treatment package is more effective. As indicated in the literature, Crozier and Tincani (2005) demonstrated that a SS intervention was effective in decreasing disruptive behavior in a child with autism when used in conjunction with verbal prompts. Researchers have also incorporated response cost (Swaggart et al., 1995),
role-play (Chan & O'Reilly, 2008), and reinforcement (Iskander & Rosales, 2013) into SS as part of treatment packages to increase the efficacy of the SS.

The results of the study indicate that the use of SS with IST had a meaningful impact on the use of household chemical safety skills. However, the use of verbal prompts was needed for all participants at least once to engage the participating children in the final targeted safety step (informing an adult). The use of tangible reinforcements was also needed in a few sessions for the children to engage in reading the story. The children were also given reinforcement (praise or tangible) before reading the SS, once the correct safety skills were demonstrated, or after they practiced and independently engaged in the targeted safety skills when they were not cooperating with their parents or researcher to engage in the reading activity or in-situ assessment. This may imply that when SS are used in conjunction with IST for toddlers and preschool aged children, prompts or reinforcement may be required to help the young children engage in the desired behavior, particularly, when environmental events are affecting their behavior during the intervention session.

DM turned 3 years old, and SF turned 4 years old toward the end of the study. Compared to ZF, they both showed swift improvement in the second intervention phase, demonstrating the target safety skills. ZF was still 2 years old at the end of the study. This may indicate that the use of SS in conjunction with IST may not be as successful with 2-years-old toddlers. In most studies on SS, the age of participants were between 3 years 10 months (Kuoch & Mirenda, 2003) and high school age (Kim, Blair, & Lim, 2014), and in most studies on IST ages 4 (Miltenberger, et al., 2005) to 9 years (Kelso, Miltenberger, Waters, Egemo-Helm, & Bagne, 2007). Jostad, Miltenberger, Kelso, and Knudson (2008) also used BST and IST procedures to teach gun safety skills to children between the ages of 6 and 7 years.
Benefits of the present study include ease of implementation. All participants initially enjoyed reading the SS with the parent, and showed improvement in during the SS phase with their household chemical safety skills. As indicated by the results of social validity surveys, the participating children’s parents reported that the implementation of the intervention was effective in teaching the children safety skills, easy to implement, decreased the likelihood that the children would ingest hazardous chemicals, would use the treatment again, and had a positive experience with the treatment. According to the parent report, DM’s older sister also learned from DM about household chemical safety skills, engaging in the use of those skills, and reminding adults not to leave chemicals where children could come in contact with them.

Limitations

A limitation for this study includes the absence of a live recording method. Parents of the participating children were not comfortable using baby monitors during the in-situ assessment due to safety concerns; including security breaches via the Internet. Also, because of the age of the children, the children were always in the line of sight of the parents, including during the assessment. The researcher was hidden from the children to the best of her ability during the in-situ assessments. Although the researcher was hiding during the assessment sessions, it is possible that the children could have seen the researcher or the placing of the chemical container during some of the assessment sessions. In a few sessions, the in-situ assessment took place before the researcher was hidden during which researcher ignored the children, assisting the parents, or implementing the IST sessions for the parent. There is a possibility that the children experienced reactivity. The researcher provided the parents with the iPad and safe chemicals prior to the session. The researcher’s presence could also have potentially acted as a
discriminative stimulus for each child’s use of the safety skills due to the fact that the SS was only read, and the assessment and training were only conducted if the researcher was present. The researcher attempted to diminish the discriminative stimulus by coming before or staying after the assessment to talk to the parent so the child would potentially only view the researcher as the parent’s friend.

Another limitation is that IOA was not assessed during the baseline phase for ZF or DM, and during SS phase for ZF or SF, although IOA assessment across all phases and participants are an important quality indicator of single-subject design research (Cooper, Heron, & Heward, 2007). When IOA was assessed, the researcher would send a video of the participant’s session to the research assistant, and the research assistant would score the video independently. However, due to scheduling or other issues (e.g., the children were only wearing diapers, the researcher forgot to set up the smartphone to record the sessions), video recording was not conducted in some sessions at the beginning of the study. Additionally, a few videos did not clearly capture the location of chemical, and the session data were not counted. However, IOA was 100% in all assessed sessions in baseline and SS phases across participants. It was assessed during the majority of the sessions in the SS plus IST phase for all participants with 100% IOA except one session for DM. The IOA assessment data in these sessions can be used as a proxy for the baseline and SS data for, given that IOA tends to drift over time compared to earlier in the study (Cooper, Heron, & Heward, 2007). The definition for acceptable behaviors were also not as clear when participants were ill, distracted, tired, or affected by other extraneous variables, and that this may have affected scoring, although IOA was still high.

A third limitation for the current study includes parents needing additional prompting or assistance prior to or during sessions in the SS plus IST phase to implement the interventions
with 100% fidelity. The parents required prompting because the child would not practice three times as indicated in the fidelity checklist. Parent fidelity suffered because, during a couple sessions, the children were not willing to practice, or refused to engage in practicing the safety skills. Parents were also prompted to give responses (e.g., prompting the parent to say “Great job!” or correct the child’s performance by saying, “Oh, that’s a chemical, you shouldn’t touch that, who are you suppose to tell?” or “After you leave, who to do tell?”) for participant’s performance. Parent treatment fidelity was conducted for less than 30% of the sessions, which was due in part to the researcher being involved for the majority of the sessions to provide prompts to the parents during implementation.

All participants struggled with telling parents. ZF needed verbal prompts prior to in-situ assessment. ZF also needed extra training during the SS plus IST phase because she always tried to pick the chemical up to bring to mom. Perhaps there was a communication barrier undetected in the screening prior to beginning the study, or another possibility could be that ZF was used to bringing adults things that were not toys, or maybe she was asked to hand things to other adults often. All children received a verbal prompt (e.g., “what do you see”, “Now what”, “What do you do next”, “Oh no”) from parent in SS and IST. This may have had an effect on the children, potentially becoming prompt dependent. During some assessments, parents had to provide additional verbal prompts, or the parent had to direct the child to play, or retrieve something in the location where the chemical was present, thus giving the child the opportunity to run from the chemical without seeing it. The researcher also considered that the word “chemical” was too hard, or too much effort to say for all participants. The researcher accepted other topographies of informing the adult of the chemical based on the child’s day and mood as long as the function was the same (did not touch chemical, left area, pointed, gestured, got mom’s attention).
The fourth limitation to this study is the lack of control for extraneous variables that may have been a source of variability in the data. Extraneous variables for the current study include participants becoming distracted or affected by uncontrollable environmental surroundings or factors such as missing naps, being an uncomfortable temperature due to a broken air conditioner, times of day parents were available to conduct the study, pets playing, dogs barking, siblings, guests in the participants home, the door bell ringing, televisions, other family members engaging in preferred tasks, illnesses, and parents’ unforeseen health issues during the time of the study. ZF and SF’s mother was expecting her third child at the time of the study and was having complications. DM’s mother was also diagnosed with a serious illness during the study. Researcher helped parents by prompting parents, and practicing the skills with the parents or children during the SS plus IST phase. SF and DM also needed tangible reinforcement to engage in reading the story near the end of the current study. For example, ZF previously demonstrated the target skills 3 times, but in session 18, the air conditions was out and she missed a nap; according to parent ZF was “having a rough day”, which might have affected her low performance that day. The session ended up being terminated because ZF was attempting to play with the chemical and engaging in noncompliant behavior. Eventually during the IST she started to attempt to poke at the chemical. The score of 0 was recorded for that session.

Another limitation is the limited experimental control due to not making phase changes immediately after a stable pattern was established in baseline or phase 1 of intervention (e.g., the researcher could have started SF on the SS phase after three data points in baseline, but did not start him on the SS phase until five baseline data points were collected). Limiting the exposure to the chemical or in-situ assessment could have decreased the variability in the data due to satiation. Another limitation is the lack of follow-up sessions for all of the participants.
Conducting follow up sessions would have allowed the researcher to determine if behavior change would maintain. Jostad et al. (2008) found that assessing long-term skills is important to identify maintenance failures, and if these failures occurred then booster sessions were used as needed. Booster sessions can benefit the participant by allowing them to re-learn the skills that are taught in the current study.

**Future Research**

Future researchers should consider including children of parents who are willing to use baby monitors and leaving an iPad and safe chemical containers with the parents of the participants in order to potentially reduce participant reactivity. Future researchers should also consider video recording all sessions to ensure the accuracy of scoring and observer reactivity, use naïve observers to minimize measurement bias, develop clear and complete definitions to include examples and non-examples of acceptable prompts to avoid biased scoring, and note extraneous variables. These can also help when training research assistants who are assessing IOA. Data should also be recorded immediately after a session to ensure accuracy of scoring.

In order to reduce prompting parents before or during intervention sessions, it may be beneficial for future researchers to retrain parents prior to every phase. Further researchers should also consider lessening the requirement for children to practice the skills correctly. It was found that the initial requirement of practicing the skills 3 times may have required too much response effort for the participants, especially when he or she missed nap or snack, or was ill.

Another recommendation for future researchers would be providing verbal prompts to the children at the beginning of the intervention phase, and fade prompts in the final phase. Additional recommendation for future researchers would be using a better scoring system that is
more individualized and clearer. The current study used a rating scale, using an individualized rating scale and including a list of criteria for terminating sessions and potential distractors may also be beneficial. A better attempt to control extraneous variables, as well as blocking attempts to touch or engage with the hazardous chemicals in the participant’s home during the IST should also be considered. Future research should also ask the parents to evaluate their satisfaction with the intervention at the end of each intervention phase to examine whether they were satisfied with SS only or SS combined with IST intervention.

Future researchers should also consider using real pictures of chemical containers and the children in the SS phase. Real pictures of the chemicals were not used in the SSs for the participants. This could potentially increase the efficacy of the SS during the SS phase. Future research should also conduct follow-up sessions to examine the intervention maintenance effects. Finally, more research is recommended to examine the use of SS with IST to teach toddlers and preschool-age children chemical safety skills or different age groups.
REFERENCES


behavioral skills training with and without simulated in situ training for teaching safety

*annual report of the American Association of Poison Control Centers' National Poison
Data System (NPDS): 32nd annual report*. Clinical Toxicology, 53, 962-1147, doi:
10.3109/15563650.2015.1102927.


https://www.preventinjury.org/PDF/2013-Poisoning

interventions for children with autism spectrum disorders. *Focus on Autism and Other
Developmental Disabilities*, 19, 194-205.

difficulties. *Educational Psychology in Practice*, 17, 337-345.

Summers, J., Tarbox, J., Findel-Pyles, R. S., Wilke, A. E., Bergstrom, R., & Williams, W. L.

APPENDICIES
Appendix A: Participant Eligibility Survey

Answer the following questions by circling “Yes” or “No”
*Indicates exclusionary questions if answered “no”

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes or No</th>
</tr>
</thead>
<tbody>
<tr>
<td>*1. Has your child previously received any safety skills training?</td>
<td></td>
</tr>
<tr>
<td>*2. Is your child 2 years to 3 years and 11 months old?</td>
<td></td>
</tr>
<tr>
<td>*3. Is your child typically developing?</td>
<td></td>
</tr>
<tr>
<td>4. Has your child ever ingested a hazardous household chemical such as laundry or dishwasher detergent packets found in your home?</td>
<td>Yes or No</td>
</tr>
<tr>
<td>5. Have you ever found your child playing with a hazardous household chemical in your home?</td>
<td>Yes or No</td>
</tr>
<tr>
<td>6. If you answered “yes” to question 5, has your child been caught playing with a chemical more than once?</td>
<td>Yes or No</td>
</tr>
<tr>
<td>7. If your child came into contact with a hazardous household chemical in your home, would you say it is very likely that he or she would bite or consume it?</td>
<td>Yes or No</td>
</tr>
<tr>
<td>8. Would you be interested in your child learning what to do when he or she encounters hazardous chemicals in your home?</td>
<td>Yes or No</td>
</tr>
<tr>
<td>9. Would you be interested in learning how to teach your child what to do if he or she encounters a hazardous chemical in your home?</td>
<td>Yes or No</td>
</tr>
<tr>
<td>*10. Would you be willing to allow training to occur in your home?</td>
<td></td>
</tr>
</tbody>
</table>
Appendix B: Safety Checklist for Primary Researcher

Date: ________________  Participant: ______________________________

Location:

Circle “Yes” or “No” if this is secure and then place your initials in the last box in the row.

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Yes or No</th>
<th>Initials:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fabuloso (kitchen)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cascade Complete Pac (kitchen)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lysol Complete Clean toilet bowl cleanser (bathroom)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comet Scratch Free Disinfectant with Bleach (bathroom)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gain fabric softener dryer sheets (laundry room)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latches were installed on cabinets, and only containers listed above were present in cabinet</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Appendix C: Sample Social Story

**Hazardous Chemicals**

A Social Story
By: Courtney Ek

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Every day I play at my house. I like to play with my toys.

I usually play in my room.

While I play, my parents do their chores. Sometimes they clean.

I am not allowed to touch chemicals. They can make me really sick.

Sometimes they use chemicals.
If I see a chemical, the first thing I should do is not touch it.

The second thing I should do is leave the room.

After I leave the room, I need to tell an adult that there is a chemical.

If I see a chemical I will try not to _______ it.

Then I will try to
Leave the _______ as fast as I can!

After I leave the room I will try to
tell an _______ right away.
### Appendix D: Hazardous Chemical Data Sheet

<table>
<thead>
<tr>
<th>Date/Observer</th>
<th>Chemical</th>
<th>Touched the chemical containers regardless of any subsequent responses (0 points)</th>
<th>Didn’t touch the chemical containers, but did not leave the area within 30 s (1 point)</th>
<th>Didn’t touch the chemical, left the room within 30 s, but didn’t tell an adult, or didn’t touch the chemical, stayed in the area, but shouted to the parent about the presence of the chemical (2 points)</th>
<th>Didn’t touch the chemical containers, left the area, and told an adult about the chemical (3 points)</th>
</tr>
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</table>
### Appendix E: Treatment Fidelity Checklists

#### Social Story Treatment Fidelity Checklist

<table>
<thead>
<tr>
<th>Step</th>
<th>Correct Steps</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The parent verbally prompts the child to sit with them and start the Social Story.</td>
<td>1 / 5 = ______ x 100 = ______%</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2. The parent reads the Social Story to his/her child.</td>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>3. The parent asks the child four or five comprehension questions.</td>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4. The parent provides the child verbal feedback for the responses.</td>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>5. The parent provides the child with an opportunity to utilize the skills learned from the story within 20 min after reading it (i.e., the parent will say something like, “Participant’s name, will you please go to the bathroom and retrieve my hair brush?”), and the bathroom will contain a chemical in the participant’s sight).</td>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

#### In-Situ Training Treatment Fidelity Checklist

<table>
<thead>
<tr>
<th>Step</th>
<th>Correct Steps</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The parent instructs the child to perform the safety skills (i.e. do not touch the chemical container, leave the area within 10 s, and tell an adult about the presence of the container).</td>
<td>1 / 3 = ______ x 100 = ______%</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2. The parent has the child practice the skills until being able to perform the skills three times.</td>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>3. The parent provides positive or corrective feedback for correct or incorrect performance.</td>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

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## Social Validity Survey

Please answer the questions below by placing a checkmark on the line next to the answer that best describes how you feel about the treatment. Please read the items very carefully because a checkmark accidentally placed on the wrong line may not represent how you intended.

1. I found this treatment to be effective in teaching my child hazardous chemical safety skills.
   - ____ Strongly disagree  ____ Disagree  ____ Neither agree or disagree  ____ Agree  ____ Strongly agree

2. I found this procedure easy to implement.
   - ____ Strongly disagree  ____ Disagree  ____ Neither agree or disagree  ____ Agree  ____ Strongly agree

3. I believe this treatment decreased the likelihood that my child would ingest hazardous chemicals.
   - ____ Strongly disagree  ____ Disagree  ____ Neither agree or disagree  ____ Agree  ____ Strongly agree

4. I will use this treatment again.
   - ____ Strongly disagree  ____ Disagree  ____ Neither agree or disagree  ____ Agree  ____ Strongly agree

5. I had a positive experience with this treatment.
   - ____ Strongly disagree  ____ Disagree  ____ Neither agree or disagree  ____ Agree  ____ Strongly agree
Appendix G: Inter-observer Agreement: Hazardous Chemical Safety Skills

Participant:

Write the participant’s score (0 to 3) in the box corresponding with the session based on the participant’s behavior

<table>
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<th>Session</th>
<th>Behavior</th>
<th>Score from observer 1</th>
<th>Score from observer 2</th>
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Number of Agreements
Number of Agreements + Disagreements x 100= Percent of inter-observer agreement per session

Total:___________%
Appendix H: Parent Scripts

Social Story™ Parent role: “Child’s name” let’s read a story. Please go to “designated room” and turn on the iPad. After parent reads the story, he or she is to ask the child 4 or 5 comprehension questions:

1. What is the first thing you should do if you see a chemical? (answer- don’t touch it)
2. Where should you go? (answer- find an adult)
3. Who should you tell? (answer- an adult)
4. Are you allowed to touch chemicals? (answer- no)
5. Are chemicals safe for kids to use? (answer- no)
6. Who can touch a chemical? (answer- adult, mom, dad…)

After each question the parent is to provide praise. Examples: “Great answer! Always run away from a chemical.” “That is right! Always tell an adult if you see a chemical” “You are awesome!” “Very good! Children are not allowed to play with chemicals.” etc.

If the child incorrectly answers the question, the parent is to open the story and provide corrective feedback. Example: “Child’s name, look at the story. In the story, the child is to (a) not touch chemical, (b) run away from the chemical, (c) find an adult and tell them about the chemical”.

Social Story™ and In-Situ Training Parent role: After reading the story, the parent is to instruct the child to go play in a room, clean something in the room, and leave the room and the chemical where the child can access it.

If the child does not touch the chemical, leave the room, and tells the parent, the parent will immediately provide feedback on the performance. Example: “Great job! I am so proud of you for not touching the “name of the chemical”, leaving the room, and coming to tell me!”; “Child’s name” Excellent! Thank you for not touching the name of the chemical, leaving the room, and coming to get me!”

If the child does not leave the room, or touches the chemical, the parent will then enter the room and say, “Child’s name, this is “name of the chemical”, it is not safe to touch. When you see this, do not touch it, leave the room as fast as you can, and come tell me or any other adult. This is really important. We need to practice what you should do right now.” Then In-Situ Training will begin.

The parent will have the child practice the skills (1. Do not touch, 2. Leave the room, 3. Tell an adult immediately) until the child demonstrates the skills correctly three consecutive times.
Appendix I: IRB Approval

9/28/2016

Courtney Ek  CFBH-Child and Family Behavioral Health Tampa, FL 33612

RE: Expedited Approval for Initial Review

IRB#: Pro00027877

Title: Social Story TM and In-Situ Training at Home: Effects on Household Chemical Safety Skills in Young Children

Study Approval Period: 9/26/2016 to 9/26/2017

Dear Ms. Ek:

On 9/26/2016, the Institutional Review Board (IRB) reviewed and APPROVED the above application and all documents contained within, including those outlined below.

Approved Item(s): Protocol Document(s):  SS & IST Protocol_V1.docx

Consent/Assent Document(s)*: Parental Permission & Parent Consent, Version #1.docx.pdf

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consent/assent document(s) are only valid during the approval period indicated at the top of the form(s).

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR 56.110. The research proposed in this study is categorized under the following expedited review category.
(6) Collection of data from voice, video, digital, or image recordings made for research purposes.

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Per CFR 45 Part 46, Subpart D, this research involving children is approved under 45 CFR 46.404: Research not involving greater than minimal risk to children.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval via an amendment. Additionally, all unanticipated problems must be reported to the USF IRB within five (5) calendar days.

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

Sincerely,

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